

Technological Affordances: An Instructional Unit for University Students

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Needs Assessment

Purpose of Needs Assessment

As an instructional designer, it is critical to identify learning needs and select technologies that afford action potentials, instead of blindly choosing technology with no concrete reasoning (Bower, 2017, p. 66). Therefore, the purpose of this needs assessment is to examine the gaps in knowledge and common misconceptions regarding technological affordances and how they impact the instructional design decisions of students at the University of Virginia.

Summary of Needs Assessment Process

The data for this needs assessment were collected through brief interviews with faculty members at the University of Virginia. Survey data were also collected from students at the University of Virginia enrolled in the Instructional Design & Technology program, Curriculum and Instruction program, as well graduate coursework for their own professional learning. The results of these surveys and the information obtained from the interview questions with faculty were then analyzed to determine a list of instructional needs.

Summary of Needs Assessment Results

Below is a summary of data collected from the faculty interview questions, as well as the survey results.

a. Faculty interviews revealed the following:

- Many students have not taken coursework or conducted research on technological affordances.

- Students are selecting technology based on features or excitability without examining the utility needs of the technology.
- Students begin a design project and find that the technology does not serve the needs of the content, learner, or instructional delivery.

b. Survey results revealed the following:

- 20% of students surveyed, could define technological affordances and explain how they impact decisions within the instructional design process.
- 10% of students surveyed mentioned technological affordances or utility as consideration within their technology selection process.
- 80% of the students surveyed have not studied affordances within their coursework.

Prioritized List of Needs

A list of needs was then identified from the data collected and then prioritized by the area of need. See next page.

Table 1
Prioritized List of Needs

Prioritized List of Needs		
Need Statement	Learning Need	Critical Issues
Students need to identify the affordances of given technology	-Students demonstrated a misunderstanding of technological affordances within their discussion board posts.	-Lack of instruction surrounding the affordances - Lack of understanding regarding research-based strategies for technology selection and integration
Students need to select technology based on how it affords the learning objective, learner characteristics, and/or task facilitation.	- Students are integrating technologies that do not support the learner or instructional needs	-Lack of instruction surrounding affordances and the role they play in the technology selection process -Choosing technologies based on the “excitability” or “newness,” not utility

Goal Analysis for the Instructional Intervention

Identified Aim

The intent of my instructional intervention will be to introduce the concept of technological affordances and demonstrate how students should select technology through an informed process.

Set Goals

As a result of this instructional intervention learners will be able to do the following:

Table 2
Set Goals

Set Goals
Students will define technological affordances
Students will identify technological affordances upon examining a given technology
Students will describe how a technology's features afford a give instructional task or learner need
Students will use their knowledge of technological affordances within their own technology selection process when designing instruction.

Rank-Ordered Goals

The following goals were ranked and finalized for the instructional unit.

Table 3
Rank-Ordered Goals

	Rank-Ordered Goals
#1	Students will identify technological affordances upon examining a given technology.
#2	Students will describe how a technology's features afford a given instructional task or learner need.
#3	Students will use their knowledge of technological affordances within their own technology selection process when designing instruction.

Goal Statement

Overall Goal Statement
Upon completion of this instructional module, students will select technology that will afford their instructional design decisions using a research-based selection process.

Learner Analysis

General Characteristics

The students targeted in this intervention are students at the University of Virginia with varying educational levels (undergraduate or graduate) enrolled in various degree or non-degree seeking programs. Many of these students are K-12 educators. However, many students are in other professions (business, nonprofit work, consulting, full time student, etc). These students vary in age, gender, and race.

Specific Entry Characteristics

Students are accessing this instructional unit because it is coursework within EDIS 7010, Computer Courseware. Others are accessing this unit because they are self-motivated and want to make purposeful, research-based decisions when selecting technology and integrating it within instruction.

Academic Information

Academic information does not apply to this, as the intention of this intervention is to develop the students' skill set relating to instructional decision making. However, it should be noted that university students should maintain a passing grade point average to stay enrolled at the University of Virginia and continue to have access to this coursework.

Personal and Social Characteristics

The instruction developed for this intervention will be designed with the accessibility and motivation of all students in mind, using Universal Design for Learning and Attention, Relevance, Confidence & Satisfaction models to design the instruction.

Contextual Analysis

Orienting Context

Learners would access this instruction because they may consider using technology within their instructional designs. There is a high need for instruction regarding technological affordances, as students in educational and instructional design fields recognize the effectiveness of research based instructional delivery methods. By accessing this instructional unit students can examine how “technological affordances can impact learning at a deeper level” (National Academies of Sciences, 2018, p.166). Students can explore how technology can support interactivity , adaptively, opportunities for feedback, choices in activities, nonlinear access, linked representations, open-ended learner input, and communication with others in an attempt to provide effective instruction (Mayer, 2009, as cited in National Academies of Sciences, 2018, p. 166; Moreno & Mayer, 2007 as cited in National Academies of Sciences, 2018, p. 166).

Instructional Context

Many students are currently enrolled in online coursework due to the COVID-19 pandemic, or because their program is a fully online program. Many students are also working professionals with full time careers. As a result, this unit should be designed with an online and asynchronous access in mind. This provides all students the opportunity to access this information at a time that is convenient to their schedules. The instructional unit should be housed within Canvas, as that is the LMS that is used at the University of Virginia and is used to share coursework with students.

Transfer Context

The instruction for this unit should be developed so that students at the university can transfer what they learn about technological affordances and use this information to impact their decisions to select and integrate technology into their own instruction. Students at the university can also use what they have learned about technological affordances in collaboration with the use of other design models and principles within their instructional designs. This understanding of affordances will enhance the technology selection process, which will have significant impact on instructional delivery and learning outcomes (Bower, 2017, p. 74).

Task Analysis and Objectives

This task analysis uses a topical analysis approach to address the instructional needs of this unit. The unit will serve as a resource for university students who may be considering integrating technology into their instructional designs, but have not yet studied technological affordances. There are a variety of facts, concepts, and principles within the cognitive domain, as well as attitudes within the affective domain to be addressed within this instructional unit. Although there are procedures that should be implemented when integrating technology into instruction, the purpose of this unit is to provide university students with the knowledge and tools to develop their own procedural strategy for selecting and integrating technologies within their designs.

Concepts

The learners focused within this instructional unit have varying skill levels regarding technology integration and usage, as well as in instructional design and implementation. That said, it is important to link the concept of affordances to the principles of technology, pedagogy, and content. This unit should answer the question “What are affordances and how are they applied within technology integration?” Students should also have an understanding of affordance varieties, such as functional vs instructional affordances can impact their design decisions (Bower, 2017, p. 69; National Academies of Science, Engineering, and Medicine, 2017, pp. 165-166). By having an understanding of the concept of affordances students can then begin to analyze how key instructional design principles impact the technology integration

process. This will be critical as students use this information to create their own technology selection methods.

Principles

When integrating technology into an instructional design, it is important to use research-based principles to guide decisions that will positively impact content delivery and learner accessibility. This unit aims to demonstrate how technology is purposefully selected and matches the pedagogical needs of the task at hand (Jonassen, Lee, Yang, & Laffey, 2005). Those accessing this unit should also recognize the significance of learning outcomes and learner needs, so that they can begin to understand how affordances tie into their own instructional needs (National Academies of Science, Engineering, and Medicine, 2017, p 164). Students should also understand that the technology selected should afford not only the needs of the learner, but the instructor as well (Antonenko, Dawson, & Sahay, 2016). The research behind these principles will help ground students in their decision-making processes for selecting and integrating technology based.

Attitudes

Instructors and instructional designers with experience developing instruction are familiar with a variety of research-based design models and principles. That said, they understand how critical it is to design instruction that is purposeful and effective in its delivery and accessibility methods to all learners. Although the university students accessing this unit may have varying degrees of experience with design methodologies and implementation, their attitudes towards research-based practices and

understanding of learning needs and outcomes will serve them well when studying technological affordances.

Procedures

The incorporation of technology within an instructional design should be purposeful. That said, university students should take all of their prior knowledge regarding research-based design methods, as well as the facts, concepts, and principles cited within this unit to develop their own technology selection method. The procedure listed within this analysis recommends that students analyze their own learning outcomes, learner needs, and design models as well as examine the action and utility needs within their instructional design. Students can then develop their own strategy for selecting technology through this analysis.

Domains

The concepts and principles included within this unit were then categorized within the cognitive domain as they involve the intellectual aspects of learning. The attitudes incorporated into this unit were then categorized into the affective domain, as they demonstrate the learner's behaviors. The mapping of the cognitive and affective domains will then help us develop our instructional objectives. See chart on the next page.

Table 4
Domains

Domains
Cognitive Domains
<p>Concepts</p> <ul style="list-style-type: none"> - affordances - constraints
<p><i>Principles & Rules</i></p> <ul style="list-style-type: none"> - Technology selection should be purposeful - Technology selection should consider content, learner, and instructional needs
Cognitive Procedures
<ol style="list-style-type: none"> 1. Analyzing the following within an instructional task: <ul style="list-style-type: none"> - design models, learning outcomes, learner needs, user needs, and technological affordances 2. Select technology that provides affordances that support learning outcomes, learner needs, and user needs within the instructional design.
Affective Domain

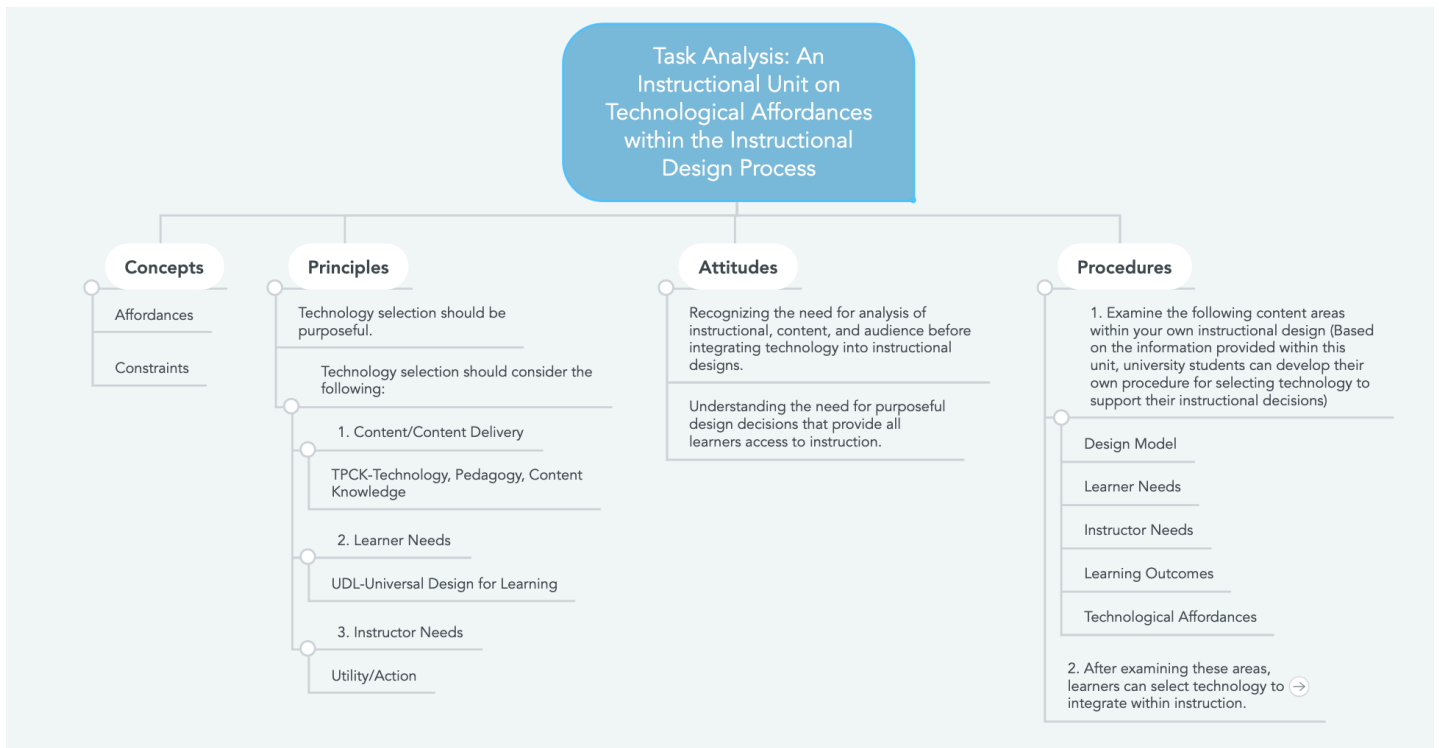
Attitudes

- Recognizing the necessity of research-based design models and principles when designing instruction
- Understanding the need for purposeful design decisions that provide all learners access to instruction.

Mind Map

The Mind Map shown below demonstrates how the concepts, principles, and attitudes covered within this unit support the need for instruction regarding technological affordances and how they impact decisions within the design process. Students will then use this information to develop their own procedure for selecting technology to integrate into their instructional designs. See map on the next page.

Figure 1
Task Analysis: Mind Map



Performance Content Matrix

The Performance Content Matrix below demonstrates the concepts, principles, procedures, and attitudes that learners will be able to recall or apply in relation to instructional technology and the instructional design process. This matrix also provides a visual that shows the initial presentation learning strategies and generative strategies that will be used to present information and demonstrate learner understanding. See table on next page.

Table 5
Performance Content Matrix

Performance Content Matrix		
Strategy		
Content	Recall	Application
Fact		
Concept	<p>Initial Presentation: Provide definition of affordances</p> <p>Generative Strategy: - Explain affordances</p>	<p>Initial Presentation: -Examples of affordances -Examples and non-example of technological affordances provided -Organize examples of affordances into categories</p> <p>Generative Strategies: - State examples and non-examples of affordances -Learners think of a time technology has afforded their own instruction or learning</p>
Principles and Rules	<p>Initial Presentation:</p> <p>Generative Strategies:</p>	<p>Initial Presentation: -Examples of technology integration - Examples of analysis of instructional needs -Categorize Instructional Needs</p> <p>Generative Strategies: -Explain the reason behind technology integration within an instructional design - Practice identifying instructional needs</p>

		<ul style="list-style-type: none"> - Learners will categorize instructional needs
Procedure	<p>Initial Presentation:</p> <p>Generative Strategies:</p>	<p>Initial Presentation</p> <ul style="list-style-type: none"> -Model technology selection process -Model analysis of learning needs <p>Generative Strategies:</p> <ul style="list-style-type: none"> - Develop technology selection process -Apply technology selection procedure to design process
Interpersonal		
Attitude		<p>Initial Presentation:</p> <ul style="list-style-type: none"> -Model technology selection process based on research-based decision making <p>Generative Strategies:</p> <ul style="list-style-type: none"> - Learners will review consequences of instructional decisions within a model - Learners will imagine their own needs for technology integration - Learners will practice analyzing their own instructional needs

Learning Objectives

Below are the cognitive and affective learning objectives for this unit. The cognitive objectives are reflective of Bloom's domains. The affective objectives are reflective of Krathwol, Bloom, & Masia's domains.

Table 6
Learning Objectives

OBJECTIVE 1: After completing this instructional unit, students should be able to define affordances.
Domain of Objective: Cognitive
Level of Objective: Bloom's Level of Remembering

OBJECTIVE 2: When evaluating a technology, students will identify all technological affordances.
Domain of Objective: Cognitive
Level of Objective: Bloom's Level Understanding

OBJECTIVE 3: Students will be able to explain the significance of technological affordances in regard to instructional design decisions.
Domain of Objective: Cognitive
Level of Objective: Bloom's Level of Understanding

OBJECTIVE 4: Students will determine the utility and/or action needs of technology within an instructional design after analyzing learning outcomes, learner needs, and design models.

Domain of Objective: Cognitive

Level of Objective: Bloom's Level of Evaluating

OBJECTIVE 5: When designing instruction, students will develop a purposeful strategy for selecting technologies with attention to the instructional needs, learning context, and audience.

Domain of Objective: Affective

Level of Objective: Krathwol, Bloom, & Masia's Level of Organizing

OBJECTIVE 6: Students will select technology that affords the needs of their instruction and learners when designing instruction.

Domain of Objective: Cognitive

Level of Objective: Bloom's Level of Creating

OBJECTIVE 7: When developing instruction, students will apply their technology selection procedure to their design process.

Domain of Objective: Cognitive

Level of Objective: Bloom's Level of Applying

Instructional Strategies

The instructional strategies that are to be employed throughout this unit have been compiled into the table below. These instructional strategies used within this unit are those presented by Morrison, Ross, Morrison, and Kemp (2019).

Table 7

Instructional Strategies

Instructional Strategies			
Objective	Type of Content	Name of Strategy	How Strategy will be Used
1. After completing this instructional unit, students should be able to define affordances.	<i>Concept</i>	Integration	- Initial Presentation-The definition of affordances will be given
		Examples and Non-examples	-Initial Presentation-Examples and non examples of affordances and constraints will be provided. - Generative Strategies-Learners should classify affordance scenarios into the categories of examples and non-examples (constraints)

<p>2. Students will be able to explain the significance of technological affordances in regard to instructional design decisions.</p>	<p>Principle</p>	<p>EG-RUL</p>	<p>-Initial Presentation: Provide a demonstration and explanation of an instructional design that has effectively integrated technology will be provided.</p>
		<p>Examples and Non-Examples</p>	<p>-Initial Presentation: Providing examples of effective, purposeful technology were provided in the learning strategy above. Non-examples will also be provided to demonstrate technology integration that adds no value to the instruction.</p>
		<p>EG-RUL Elaboration</p>	<p>-Generative Strategy- After the e-learning unit, learners will provide an explanation for why the technology they have integrated into their instructional designs affords the learning task.</p>

<p>3. When evaluating a technology, students will identify all technological affordances.</p>	<p>Concept</p>	<p>Integration</p>	<p>-Initial Presentation: The definition of technological affordances will be provided</p>
		<p>Examples and Non-examples</p>	<p>-Initial Presentation: Examples and non-examples of technological affordances will be presented to students. Examples of how technology can constrain will also be provided. - Generative Strategy: Learners will be asked to think of a time technology afforded, or could afford, an instructional task. Learners will also be asked to identify the how technology affords an instructional task when provided with an example.</p>

		Organization	- Initial Presentation: Examples of affordances will be categorized according to what the technology affords. Categories will include examples of affordances that address functionality/utility, learner, instructor, and content needs.
4. Students will determine the utility and/or action needs of technology within their instructional design after analyzing learner and instructor needs, learning outcomes and content.	Principle	RUL-EG	-Initial Presentation: The instructional unit will produce examples of potential areas of analysis to consider when selecting technology. The instructional unit will explain why the analysis of an instructional design, identifying learner and instructor needs, learning outcomes, and/or content can help with purposeful and effective technology integration.
		Practice	- Generative Strategy: Learners will practice analyzing the learner/instructor needs, learning outcomes, and content within their own instructional design.

		Organization	<p>- Initial Presentation- Examples of the considerations within an instructional design will be identified and then categorized based on learner/instructor needs, learning outcomes, and the content.</p> <p>- Generative Needs- Learners will categorize the identified needs within their own instruction.</p>
<p>5. Students will select technology that affords the needs of their instruction and learners when designing instruction.</p>	Principle	EG-Rule and Integration	<p>-Initial Presentation- Provides students with examples of technology selected based on learner/instructor needs, learning outcomes, and content.</p>
		Model	<p>-Initial Presentation- Model the use of a job aid for selecting technology</p>
		Practice	<p>-Generative Strategy- Students will have access to a blank copy of the job aid and can practice using it to align instructional and learner needs to the affordances of the technology.</p>

6. When designing instruction, students will develop a purposeful strategy for selecting technologies with attention to the instructional needs, learning context, and audience.	Attitude	Model	- Initial Presentation-Model the process of selecting technology. Demonstrate the considerations that go into selecting technology and then integrating it into instruction.
		Imaginal Model	- Generative-Learners will review the consequences that come with the decisions of the instructor within the scenario.
		Mental Rehearsal	- Generative Strategy-Learners will imagine what instructional considerations they would have pinpointed to determine a need for technology within the instruction.
		Practice	-Generative Strategy-Learners will practice identifying the needs within their own instructional designs in order to integrate technology.

7. When developing instruction, students will apply their technology selection procedure to their design process.	Procedure	Practice	-Generative Strategy- Students will practice identifying needs and affordances to develop a technology selection procedure that best meets the needs of their own instruction.
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Technology Choice, Instructional Message Design, & Materials Specification

Technology Choice

For this project, a few of the objectives from this instructional unit were chosen to focus on for the remainder of this project. The Technology Choice component, documents which technologies were then selected to use within this unit and the rationale behind those decision. The Instructional Message and Design component was then developed to present the instructional sequencing of the unit, as well as to describe the design components within the unit. Then the materials were described and how they would be implemented within the project.

Targeted Objectives and Instructional Strategies

1. After completing this instructional unit, students should be able to define affordances.
Strategy: concept Integration, examples,
Activities: multimedia instruction, multiple choice questions
2. When evaluating a technology, students will identify all technological affordances.
Strategy: examples and non-examples
Activities: multimedia instruction, mentally develop examples, multiple choice questions
3. Students will be able to explain the significance of technological affordances in regard to instructional design decisions.
Strategy: provide examples and non-examples
Activities: multimedia instruction, mentally develop examples
4. Students will determine the utility and/or action needs of technology within an instructional design after analyzing learner and instructor needs, learning outcomes and content.
Strategy: Strategy: examples, categorization of analysis areas
Activities: multimedia instruction, application to instructional designs upon completion

Table 7**Technology Choice & Rationale**

Technology Choice & Rationale	
Requirements: Relevant Characteristics of Learners or Context, and/or Instructional Strategies	Best-Fitting Technology & Rationale
<p><u>Learner Characteristics:</u> All learners are graduate students considering technology within their instructional designs/projects. All students use Canvas to access grades, announcements, course content, etc.</p> <p><u>Contextual Characteristic:</u> Learners will engage in this instruction from their own device and internet connection. Accessing this e-learning unit, produced using Adobe Captivate, through Canvas will allow students to access this information asynchronously and as needed.</p> <p><u>Instructional Strategies Selected:</u> Asynchronous, self-paced unit which introduces students to new content, provides examples, resources, and checklists for students to reference as they consider technology within their instructional designs.</p>	<p><u>Canvas:</u> A Learning Management System that allows instructors to post instructional materials for students.</p> <p><u>Rationale for Selection:</u></p> <ul style="list-style-type: none"> - Capability to post e-learning materials - Asynchronous access - All of UVA's coursework uses Canvas. Students are familiar with how to use and navigate the platform.
<p><u>Learner Characteristics:</u> All learners are graduate students considering technology within their instructional designs/projects.</p>	<p><u>Adobe Captivate:</u> A software program that allows the ability to upload PowerPoint presentations as well as add interactive slides.</p> <p><u>Rationale for Selection:</u></p>

<p><u>Contextual Characteristic:</u> Learners must understand how to identify technological affordances and understand how they will address the learner, instructor, and content needs within their design.</p> <p><u>Instructional Strategies Selected:</u> Students will be introduced to new concepts and principles with multimedia examples provided, as well as multiple choice responses to monitor understanding.</p>	<ul style="list-style-type: none"> - Ability to develop an interactive tutorial with interactive slide features and multimedia presentation capabilities. <ul style="list-style-type: none"> - Voice recordings, videos, images - Multiple choice questions, drag and drop, feedback for correct/incorrect selections - Self-pacing ability
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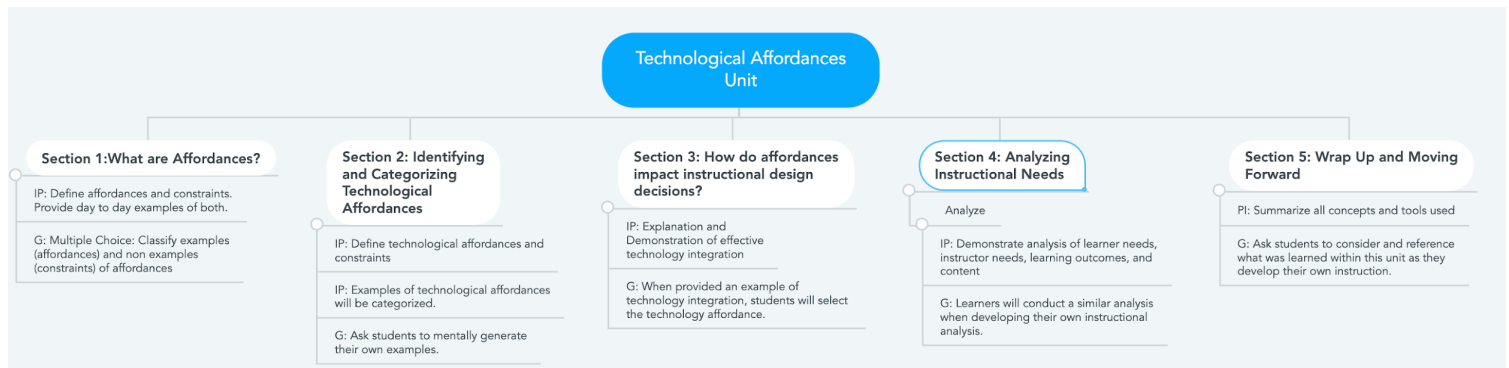
Instructional Message Design

Instructional Sequence

The instructional sequence of this unit covers the concepts and principles mapped out over five sections. Students will be introduced to technological affordances and how they impact instructional design decisions in regard to technology integration. This unit demonstrates how to identify technological affordances and how to analyze instructional and learner needs to select appropriate technologies for instructional integration. This information will serve as a guide for students as they consider technology within their own designs in the future. The image below demonstrates how this information is sequenced within the unit.

Figure 2

Instructional Sequence



Message Design Specifications

1. Pre-instruction

The content will be presented using an e-learning unit. Objectives and an overview of the unit will be shared at the start of the unit. The overview will be presented as a short paragraph explaining the purpose of the unit and who may find its information beneficial. After the intro slide, the objectives will be presented in a bulleted form. This will help students identify the critical information and principles they will be learning and how they will help them make informed decisions in integrating technology within their instructional designs.

2. Initial Presentation of Content

Voice narration and instructional text will be used to provide learners with the definitions of affordances as well technological affordances. Concrete examples of affordances and technological affordances will also be provided, as well as abstract examples that allow students to apply their knowledge to identify other examples. Images with written and voice narration will be used to demonstrate the principles of the analysis of needs, the development technology

selection strategies, and appropriate technology integration. Videos and images with written/voice descriptions will also be used to demonstrate effective technology integration.

3. Generative Learning Activities

Students will be asked to identify examples of affordances and constraints within instructional designs using interactive multiple choice slides. Students will also be asked questions that will require students to mentally develop their own examples of technological affordances as they have applied to their own instructional needs. Students will also be asked to analyze examples of technology integration to determine their effectiveness, as well as begin to mentally consider the analysis of their own project needs.

4. Review/Retention/Transfer Activities:

When students are selecting answers there will be an explanation behind why each answer is correct or incorrect, allowing students to justify or reevaluate their answers. These will be embedded throughout the e-learning unit. After the completion of the unit, students will be able to transfer what they have learned about identifying technological affordances and analyzing their instructional needs to determine how technological affordances will impact technology integration into their instructional designs. Students will be able to practice this application with purposeful questioning throughout the unit.

Implementation of Message Design for Chosen Objectives

Objective 1: After completing this instructional unit, students should be able to define affordances.

Slide- definition of affordances with examples

Instructional Text:

- **Heading**
What are affordances?
- **Text**
“**Affordances** are clues in the environment that indicate possibilities for action” according to James J. Gibson (1966)
 - A chair provides support, affording sitting or standing on
 - A door handle enables pushing or pulling, affording opening and closing

Media and Materials

Narration

Slide- definition of constraints with examples

Instructional Text

- **Heading**
Constraints
- **Text**
Constraints are what you cannot do with a tool, technology, or object.
 - A seatbelt prevents a passenger from leaving their seat
 - A lock on the door prevents a door from opening

Media and Materials

Narration

Slide- multiple choice questions related to affordances and constraints

Instructional Text

- **Heading**
Affordances vs. Constraints Check In
- **Text**
Narration: In this scenario, does fire serve as an affordance or a constraint?
Campers light a fire on a cold night and cook dinner on the flame.
(select affordance or constraint)

Narration: In this scenario, does the anchor act as an affordance or a constraint?

A captain lets down his anchor and the boat cannot move.
(select affordance or constraint)

Media and Materials: Narration, Multiple Choice Slide

Objective 2: When evaluating a technology, students will identify all technological affordances.

Slide - definition of technological affordances and constraints

Instructional Text

- **Heading**
Technological Affordances and Constraints
- **Text**
Technological affordances are the features or action potentials provided by a technology.
Technological constraints prevent learners from doing something.

Media and Materials: Narration

Slide- more examples of technological affordances

Instructional Text

- **Heading**
Technological Affordances—Action Capabilities
- **Text**
 - Media Affordances--video, recordings, visuals, read aloud, speaking, writing, drawing
 - Spatial Affordances--- resizing, moving,
 - Temporal Affordances--playback, recording, synchronous
 - Navigational Affordances-- browse, search, links, data manipulation
 - Emphasis Affordances-- highlight, focus
 - Synthesis Affordances-- combination, integration
 - Access-Control Affordances--share, permission

(These will be put into a visual with images)

Media and Materials: Narration, visual

Slide- examples of technological affordances

Instructional Text

- **Heading**
Technological Affordances—Utility Capabilities

- **Instructional Text**

You may also consider the following:

- Interactivity
- Adaptivity
- Feedback
- Choice
- Non Linear Access
- Linked Representations
- Open Ended Learner Input
- Communication

(These will be put into a visual with images and each bullet will go into more detail with narration. Narration will also ask learners to consider how they have used technology that afforded any of these tasks)

Media and Materials: Narration, visuals

Slide - examples of technological constraints

Instructional Text

- **Heading**
Technological Constraints

- **Instructional Text**

For example, you may consider technologies that...

- keep students from accessing certain sites
- limit chat features during synchronous instruction
- restrict access to some resources or materials

Media and Materials: Narration

Objective 3: Students will be able to explain the significance of technological affordances in regard to instructional design decisions.

Slide - Explain why we consider technological affordances when developing instruction.

Instructional Text

- **Heading**

Technological Affordances and Instructional Designs

- **Text**
How does an understanding of affordances impact instructional designs?
 - Effective technology integration
 - Tailored technology for instructional needs
 - Repurpose technology for educational purposes

Media and Materials: Narration

Slide- Examples of effective technology integration

Instructional Text

- **Heading**
Technology Integration
- **Text**
Instructional Need
A special education coordinator is training a group of teachers on Zoom, a video conferencing app used by the school district. She wants to train them on six special education teaching models. She has six articles for them to read, but recognizes that this training is only one hour and time is limited. The coordinator decides to break teachers up into small groups and have them read one of the articles and then share their notes with the group.

Technology Integration

Online Collaborative Whiteboard-- affords note taking and group sharing

Media and Materials: Narration

Objective 4: Students will determine the utility and/or action needs of technology within an instructional design after analyzing learner and instructor needs, learning outcomes and content.

Slide- Analysis of instructional considerations before technology integration

Instructional Text

- **Heading**
Instructional and Learner Analysis
- **Text**

- Content
 - Consider instructional models and principles such as the UDL model, TPACK, ARCS, etc.
 - Learning Outcomes
- Learner Needs
- Instructor Needs

Media and Materials: Narration, visual

Materials Specification

Table 8
Instructional Materials

<i>Instructional Materials Specification</i>	
Medium	Description & Purpose
Narration	
Voice Narration for all slides	Narration for all slides that reads all instructional text and provides more details. This will be helpful for students who are visually impaired. More instructional details will also be added through voice narration.
Medium	Description & Purpose
Interactive Slides	
Multiple Choice Questions: Affordances vs. Constraints Check In Questions	Students will use a multiple-choice option to apply their understanding of affordances and constraints to an example provided. Students will select either “affordance” or “constraint” according to the example. This will be used to gauge understanding as well as

	to provide justification for correct answers or review for incorrect responses.
Medium	Description & Purpose
Visual	
Graphic to represent the different categories of technological affordances	This graphic will organize the different categories of technological affordances. This graphic will organize the different examples of affordances into their designated categories.

Assessment and Evaluation Plans

Assessments and Evaluations are necessary to monitor learner understanding and to determine the effectiveness of instruction. The assessment plan describes how individuals demonstrate their understanding and how they produce

Table 9
Assessment Plan

Assessment Plan			
OBJECTIVE(S)	TYPE OF CONTENT	ASSESSMENT METHOD	RESULTS ANALYSIS
1. After completing this instructional unit, students should be able to define affordances.	Concept	1. Multiple choice questions within the unit	1. Answer Key-- If correct, student will move to the next section. If incorrect, student will be given the opportunity to review and answer again. Trends and answers will be analyzed by the instructor.
2. Students will be able to explain the significance of technological affordances in regard to instructional design decisions.	Principle	1. Discussion boards, if enrolled in EDIS 7010 2. Technology Integration Strategy Project (EDIS 7010)	1. Peer and/or instructor analysis and response-- are all key elements of the questions answered? 2. Rubric-- were technological affordances considered within the technology selection process?
3. When evaluating a technology, students will identify	Concept	1. Technology Review	1. Self Evaluation--when reviewing technology learners will identify its affordances

<p>all technological affordances.</p>		<p>2. Cases of Technology Implementation Projects (EDIS 7010)</p>	<p>2. Rubric--did they identify appropriate technological affordances for the task at hand?</p>
<p>4. Students will determine the utility and/or action needs of technology within their instructional design after analyzing learner and instructor needs, learning outcomes and content.</p>	<p>Principle</p>	<p>1. Technology Selection within instructional design projects</p> <p>2. Technology Integration Strategy Project (EDIS 7010)</p>	<p>1. Rubric--Did the technology selected afford the needs of the instruction?</p> <p>2. Rubric--Does the student consider their instructional needs within their analysis?</p>
<p>5. Students will select technology that affords the needs of their instruction and learners when designing instruction.</p>	<p>Principle</p>	<p>1. Effective technology integrated within instructional designs</p> <p>2. Final Project (EDIS 7010)</p>	<p>1. Rubric--Does the technology afford a given need or task?</p> <p>2. Rubric--Does the technology afford a given need or task?</p>
<p>6. When designing instruction, students will develop a purposeful strategy for selecting technologies with attention to the instructional needs, learning context, and audience.</p>	<p>Attitude Procedure</p>	<p>1. Rating Scale</p> <p>2. Students will create their own technology selection strategy-- Technology Selection</p>	<p>1. Students will complete a survey at the end of the module that will ask them a series of questions regarding their attitudes towards considering affordances within the selection and integration of technology within instructional designs.</p> <p>2. Self Evaluation- Students will develop their own procedure for selecting technology and</p>

		Method Project (EDIS 7010)	evaluate its effectiveness when developing instruction.
7. When developing instruction, students will apply their technology selection procedure to their design process.	Procedure	1. Strategy Statement and Application Project	Work Sample Review- Is there evidence of technology selection procedure?

Table 6
Evaluation Plan

Evaluation Plan	
Evaluation Purpose	
<ul style="list-style-type: none"> • Is the current level of learning acceptable? Are there weaknesses in the understanding of technological affordances and how to identify them? • Are learners applying what they learned within the module into their discussions regarding the role of technology within the design process? If not, what concepts and principles should be included when making changes? • Did the module address the needs of those who still demonstrate misconceptions? Do changes need to be made to address common misconceptions? • Are students applying what they learned about technological affordances and linking them design models and principles (ex: TPCK, UDL, ACRS, etc.) that are covered in EDSI 7010? • Is the unit user friendly for students? Is it user friendly for instructors embedding it into sites and courses? 	
Participants	
Population, Location, & Recruitment Methods:	Number to Include:

Population: Subject Matter Expert Location: Email/online Recruitment: Email communication	1 faculty member acting as the Subject Matter Expert for this instructional unit	
Population: Faculty teaching EDIS 7010 Location: Email/online Recruitment: Email communication	1 faculty member teaching EDIS 7010 in the spring, 1 faculty member teaching EDIS 7010 in the summer	
Population: EDIS 7010 Students Location: Email/online Recruitment: Canvas communication	1 class (approximately 25 students)	
Data to be Collected		
Data Type	Specific Info/Use	Source
Interview (Formative Evaluation)	<p>Before developing the instructional unit the SME will be consulted asking the following:</p> <ul style="list-style-type: none"> - Is the information included accurate and if not, what changes should be considered? - Were all important components included? - Is the platform, Adobe Captivate, appropriate to develop this unit? - Are the visuals and graphics appropriate? - Will this be an appropriate resource to house within a canvas module or site? 	SME Faculty
Interview (Summative Evaluation)	<p>After the unit is deployed to students and students have begun technology selection and integration projects/responding to discussion boards related to technology selection and integration an interview will be completed. The interview will address the following?</p> <ul style="list-style-type: none"> - Was the unit easy to integrate into canvas? - Did students note difficulty locating and navigating the unit? - Is the class demonstrating and understanding of the concepts and principles included in the unit within their projects and discussion posts thus far? 	EDIS 7010 Faculty

	<ul style="list-style-type: none"> - If there are common misconceptions, what are they and how can we address them moving forward? - Was the content relative to your instruction? 	
Survey (Summative Evaluation)	A link will be provided at the end of the e learning unit that will ask students questions relating to usability and relevance to coursework.	EDIS 7010 Students
Portfolio Reviews (Confirmative Evaluation)	<p>Review projects from the semester and review selected rubric areas that address technological affordances and effective technology integration.</p> <p>Ask the following:</p> <ul style="list-style-type: none"> - Are most students applying the concepts and principles covered within the unit? - Are these principles transferring to projects that will help support the career goals of students? - Are their concepts and principles that you would like to include moving forward? - Were there specific areas identified in the rubrics that the class demonstrated a misunderstanding or underperformance? 	Faculty and Instructional Designer over multiple semesters
Evaluation Schedule		
Date(s)	Activity(ies)	
Before the creation of the instructional unit (Dec. 2020)	The interview with the SME will be conducted via email and or zoom communication after the SME has looked over the final project submission and storyboard.	
Halfway point through spring and summer semester	Gather survey results from the e learning unit during this week to evaluate students' perspective of usability and application to coursework.	

Halfway point through spring and summer semester	Conduct interview with EDIS 7010 faculty to determine if students are applying the concepts/principles within the unit. If there have been any difficulties with integrating the unit into Canvas/have students noted difficulties locating and navigating the unit?	
End of spring and summer semesters	The work sample reviews between the instructional designer and the EDIS 7010 faculty member will find trends in misconception and determine if the concepts and principles covered within this unit were able to be applied to the projects developed within the course.	
Required Resources		
Data Type	Resource	Amount
Interview	Email questions ahead of time to SME and then meet for live zoom interview	1 hour to prep and send questions 1, 1 hour zoom interview online 1 day to analyze data
Interview	Email questions ahead of time EDIS 7010 faculty and then meet for live zoom interview	1 hour to prep and send questions 1, 1 hour zoom interview online 1 day to analyze data
Survey	Google Form	1 survey for all students taking EDIS 7010 online. 1 hour to prepare survey 1 hour to analyze data

Portfolio Reviews	Faculty will review rubrics from semester projects and take anecdotal notes, identifying strengths and areas that may need improvement regarding instructional content.	Faculty compile work samples in ahead of meeting 1 hour meeting to review rubrics and notes 1 day to analyze data
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References

- Bower, Matt. Design of Technology-Enhanced Learning : Integrating Research and Practice, Emerald Publishing Limited, 2017. ProQuest Ebook Central, <http://ebookcentral.proquest.com/lib/uva/detail.action?docID=4717043>.
- Mayer, R.E. (2009). Multimedia Learning (2nd ed.). New York: Cambridge University Press.
- Moreno, R., and Mayer, R.E. (2007). Interactive multimodal learning environments. *Educational Psychology Review*, 19(3), 309–326.
- Morrison, G. R., Ross, S. J., Morrison, J. R., Kalman, H. K. (2019). Designing Effective Instruction, 8th Edition. [VitalSource Bookshelf 9.3.0]. Retrieved from <vbk://9781119465980>
- National Academies of Sciences, Engineering, and Medicine. 2018. How People Learn II: Learners, Contexts, and Cultures. Washington, DC: The National Academies Press. <https://doi.org/10.17226/24783>