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IP&T 372 Redesign

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Design Project Report
Masters
Instructional Psychology & Technology, Brigham Young University

Purpose

The original proposal for this project was to work with BYU faculty to redesign IP&T 372: Integrating K-12 Educational Technology 2. When my project proposal was approved, IP&T 372 was a fully online course, the second of a three course undergraduate series for pre-service teachers. These courses were designed to prepare students to "effectively use and think with technology to meet current and emergent needs" in elementary and secondary education (Leary 2022). The purposes of the redesign of IP&T 372 were to (1) align the course with IP&T department goals, (2) bring the Canvas design in-line with the most current BYU Online standards for online courses, and (3) create course learning objectives and outcomes that were consistent with the most recent standards for secondary educators practicing in the field.

Shortly after my project proposal was approved, the IP&T department made the decision to completely redesign the suite of IP&T undergraduate courses: IP&T 371, 372, and 373. This resulted in a significant shift in my project purpose, and my role within the redesign. Eventually it was resolved that these three one-credit courses would be consolidated into two one-credit courses, with the goal of piloting the new IP&T courses in the fall semester of 2024. My client's objectives in the overall redesign of all three IP&T courses were to (1) create course materials that align with the International Society for Technology In Education (ISTE) standards for educators, (2) be responsive to student feedback about the courses, and (3) align with current research and best practices in the field of instructional design. After adapting to the new goals of my client and the IP&T department, the purpose of my project was to redesign the Computational Thinking unit that was currently being taught in IP&T 372.

Project Needs and Constraints

Learner Personas (see appendix A)

Learner Personas were created by analyzing:

1. student survey data (see Figure 1.1);
2. student assignment submissions: primarily student Technology Philosophy Statements, in which students describe their philosophy about technology in the classroom and how that philosophy developed over the course of the semester; and
3. personal interactions with students: two-way communications in the comment section of course assignments in Canvas, emails back and forth with students, office hours with students, and in-class small group conversations with students via Zoom breakout rooms.

Some learner personas are a compilation of students with similar backgrounds, traits, and goals. Some are based on individual students with whom I had the most extensive and personal interactions. Personas contain quotes from student surveys, emails, and assignment comments.

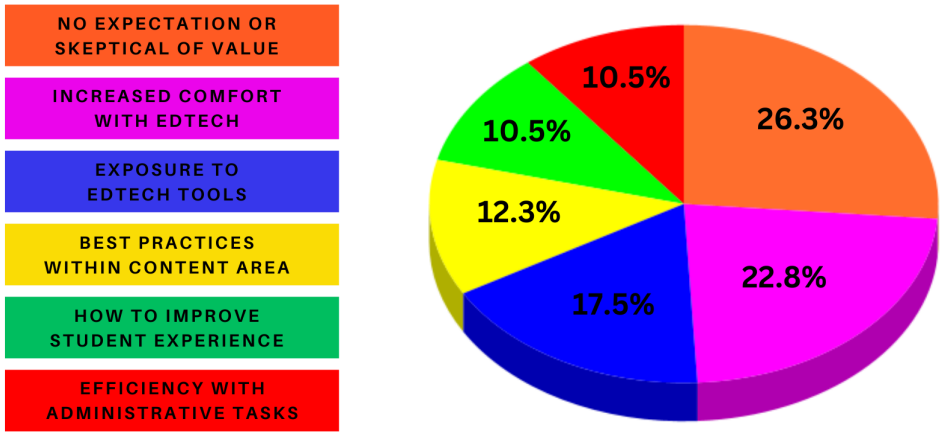
I referred to learner personas during several stages of the design process. I discussed them with my client in the initial phases of planning, and I referred to them as I created learning activities and materials. For example, the decision to film practicing teachers in the field (see Design Details section) as part of the course materials that would be made available to students was influenced by students' desires to see how the concepts in the course had practical application in the field.

Compilation of Student Data

I compiled student survey data from the IP&T 372 sections in the fall of 2022. This data revealed that many students were either unclear about what to expect from IP&T 372, or were skeptical about its role in preparing them for their work in the field of secondary education. In the first week of the fall 2022 semester, my client had students read the syllabus and then complete a Canvas quiz where they were asked what specific skills and knowledge they hoped to gain from the course. I evaluated all thirty- nine student responses and found that responses could be grouped into six main categories. When asked what specific skills and knowledge they hoped to gain from the course, students' responses included: (1) increased comfort with educational technology, (2) exposure to edtech platforms and tools, (3) knowledge about how to use technology to improve student experience, (4) best practices for technology use within their specific content areas, (5) understanding how to use technology to improve efficiency in completing teacher tasks, and (6) no clear idea about their expectations for the course, or skepticism about the value of the course (see Figure 1.1). More than a quarter of students either could not articulate what their learning outcomes would be after reading the course syllabus, or they felt skeptical about gaining relevant skills in the course.

My client's desire to align with the updated ISTE standards for educators, and the results of the student survey data, both provided support for the need to revise course objectives for IP&T 372. Although this data was specific to only IP&T 372, it still provides useful insights as part of the empathy phase of the design work on my project, especially because my focus was to redesign a module within the existing IP&T 372 course.

Figure 1.1: Student Expectations for IP&T 372 Winter 2022



Environmental Analysis (see appendix A)

The environmental analysis is based on all of the interactions mentioned above for the learner personas, with the addition of:

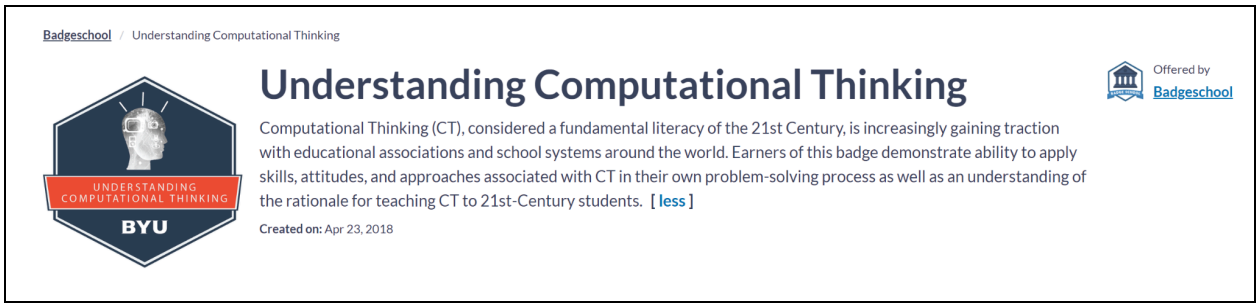
- participation in all online synchronous and asynchronous class meetings;
- navigating the course in Canvas as part of my responsibilities as a TA and an instructor;
- meeting weekly with the supervising professor and other TAs to discuss the design and implementation of course materials; and
- creating course materials as a TA and instructor.

This analysis allowed me to communicate with my stakeholders about learner needs, which was important in reaching agreement about how to refine course objectives and design course materials to meet those needs. The environmental analysis contributed to the LMS design of my project as it required me to consider constraints as well as potential advantages of the online environment of the course.

Task Analysis

Part of bringing all three IP&T undergraduate courses into alignment with the ISTE standards for educators included redesigning existing units within the IP&T courses. In IP&T 372, the second unit of the course was titled “Computational Thinking" (CT). I worked with my client to redesign this unit. In the original design of the unit the primary learning outcome was that students would qualify to receive an electronic badge, which would certify their mastery of the basic principles of CT (see Figure 1.2). In order to receive the badge students would need to complete the task requirements of the badge issuer, and receive a score of eighty percent or better on the submission form. It was my client’s desire that this learning objective remain in the redesigned unit. I therefore analyzed the requirements for learners to successfully complete the Understanding Computational Thinking Badge.

Figure 1.2: Understanding Computational Thinking Badge



Computational Thinking is a problem solving strategy Design Thinking, or other methods of problem solving that are used by experts in various fields to find solutions. To achieve an eighty percent or better on this badge, learners would need to reach the following domain goals:

- Cognitive domain goal
    a. Evaluate the effectiveness of solutions identified during the CT process.
- Skills domain goals
    a. Apply the steps of the CT process to a problem.
    b. Articulate the reasoning behind decisions made during the CT process.

Reaching these domain goals would require students to:

1. list the steps of the CT process in order,
2. define key concepts within the CT process,
3. identify a problem they face as an instructor,
4. list evaluation criteria for solutions, and
5. apply evaluation criteria to their solutions.

This task analysis resulted in the creation of a scaffolded approach to learning and practicing the steps of the CT process. I broke down the learning process for students through a series of guided practices and peer collaborations, leading to the completion of the Understanding Computational Thinking Badge. The environmental analysis was also a factor in the decision to include Problem Based Learning (PBL) in the course design. It showed that the course lent itself to having students work through a strategy based problem in order to gain the skills that would allow them to successfully reach the overall learning objective.

Design Details

I approached this design with the recognition that my learners are complex, multidimensional people who would CT in a variety of fields within secondary education. My learner personas, survey data, and environmental analysis clearly demonstrate the diversity of the learning audience. With this insight and the learning goals that my task analysis yielded in mind, my strategy for the redesign of the CT unit within IP&T 372 was to build student understanding through progressive learning activities that require students to apply CT iteratively, building up to an authentic assessment.

Each week of the CT unit was constructed to help students successfully complete the Understanding Computational Thinking Badge at the end of the unit. I designed each learning activity to simulate work that practicing teachers in secondary education engage in on a regular basis. The Understanding Computational Thinking Badge tests a student's ability to apply the

concepts of CT to real world situations, including a problem they identify in their own instructional practice. I focused on having students put theoretical knowledge into practice in scenarios that closely approximate the type of situations they will encounter when they are working as high school teachers.

LMS Design

The redesigned unit exists as a module within the Canvas course for IP&T 372. Students access the learning materials and activities through the course homepage. The design of the homepage was outside of the scope of my project. I integrated my new learning materials into the existing homepage format (See Figures 2.1 and 2.2). I expanded the unit from two weeks to three weeks, included more synchronous class time, utilized the "Project Groups" feature of the LMS to facilitate intentional group design, added links for weekly slides, and made page layouts more uniform.

Figure 2.1 Canvas Homepage Fall of 2023

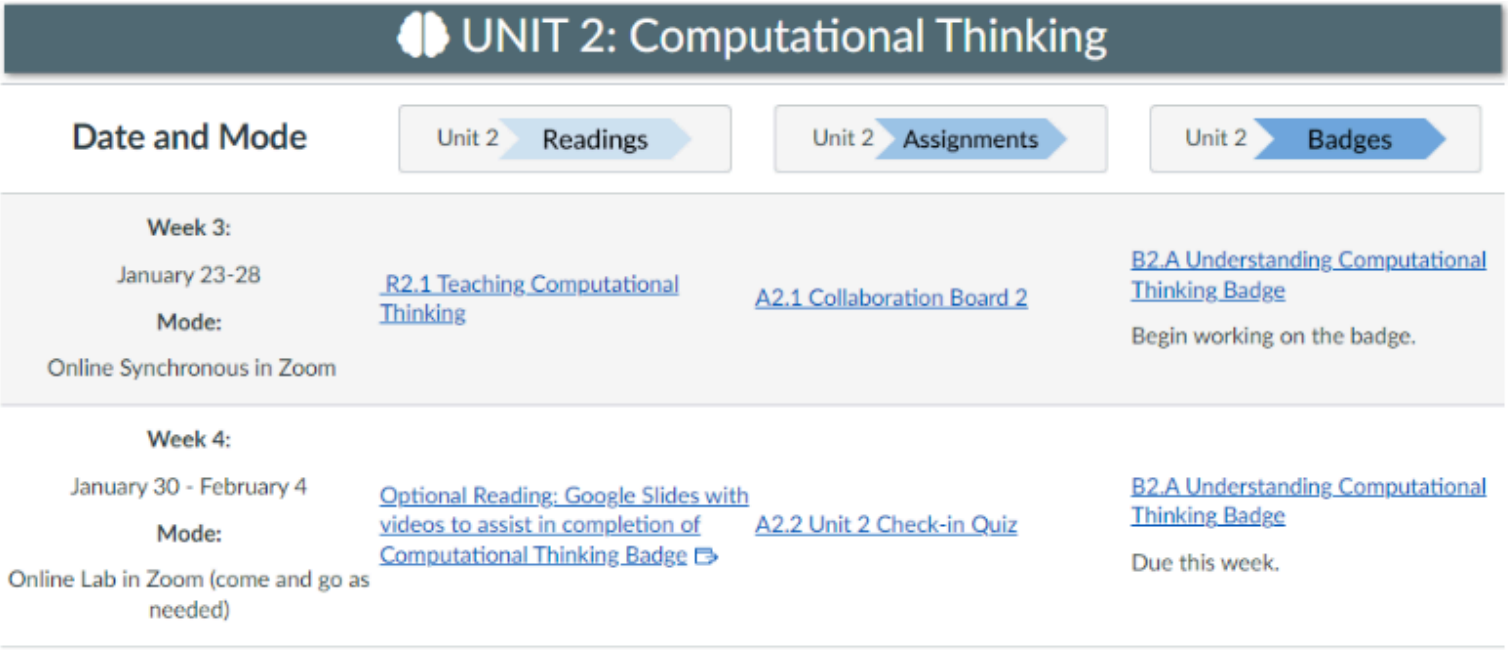
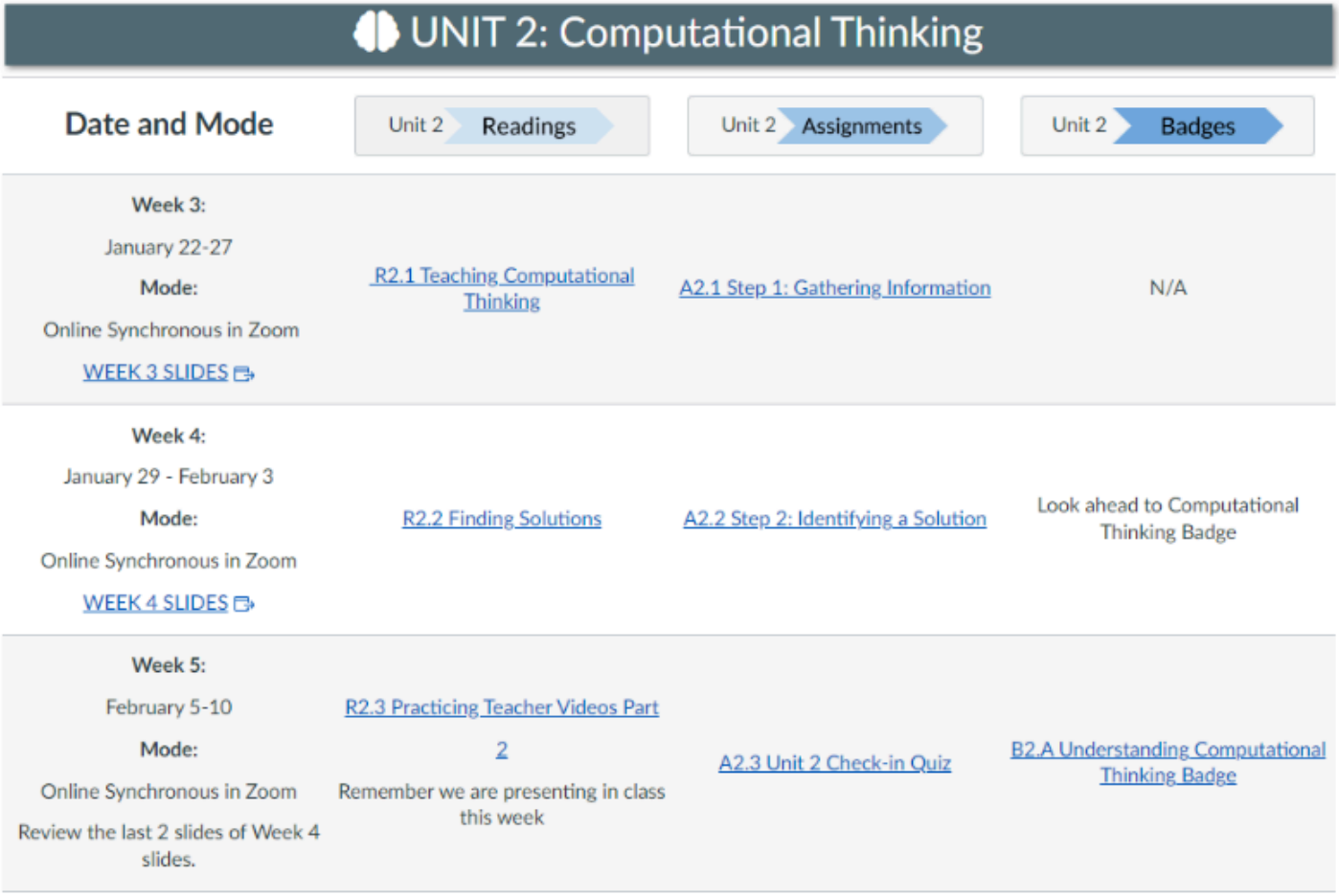


Figure 2.2 Canvas Homepage For Redesigned Unit Winter 2024



UNIT 2: Computational Thinking

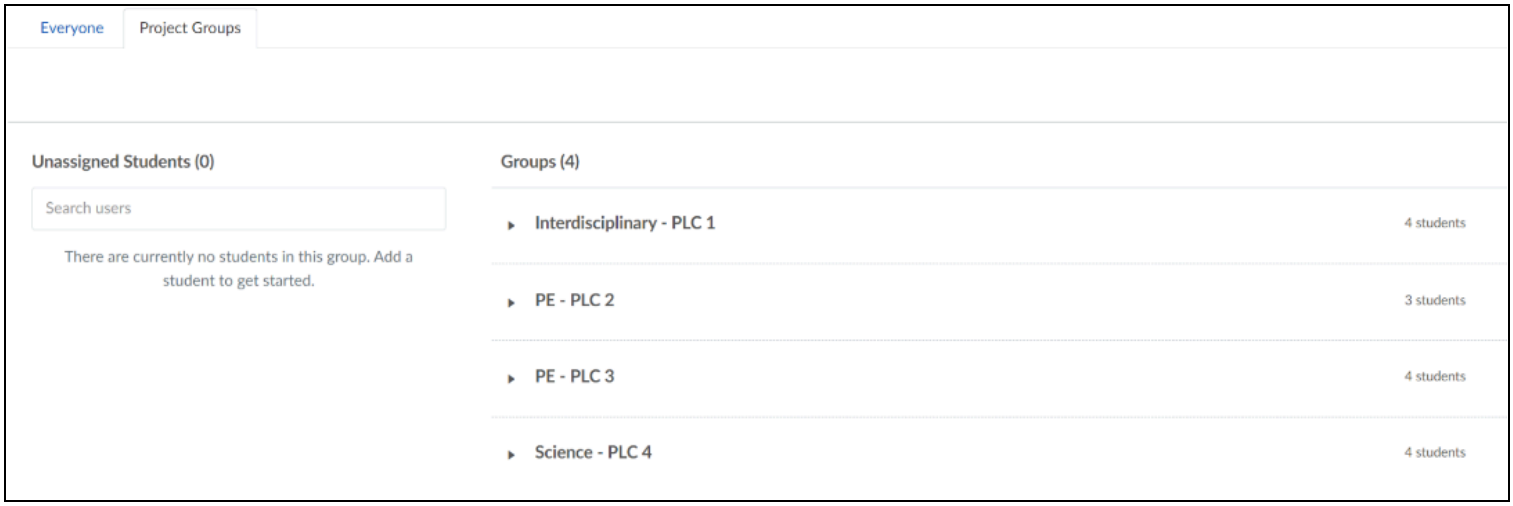
Date and Mode	Unit 2 Readings	Unit 2 Assignments	Unit 2 Badges
Week 3: January 22-27 **Mode:** Online Synchronous in Zoom WEEK 3 SLIDES	R2.1 Teaching Computational Thinking	A2.1 Step 1: Gathering Information	N/A
Week 4: January 29 - February 3 **Mode:** Online Synchronous in Zoom WEEK 4 SLIDES	R2.2 Finding Solutions	A2.2 Step 2: Identifying a Solution	Look ahead to Computational Thinking Badge
Week 5: February 5-10 **Mode:** Online Synchronous in Zoom Review the last 2 slides of Week 4 slides.	R2.3 Practicing Teacher Videos Part 2 Remember we are presenting in class this week	A2.3 Unit 2 Check-in Quiz	B2.A Understanding Computational Thinking Badge

The primary reason for expanding the timetable of the unit, increasing synchronous class time, and using the Project Groups feature was to implement PBL within the unit; improving social learning and creating authentic assessments. This decision was influenced by my research on PBL, and on building community in online classes (see annotated bibliography), as well the instruction I received in IP&T 515: PBL, IP&T 538: Teaching in Online and Blended Learning Environments, and IP&T 664: Instructional Design. These courses provided me with product precedents for PBL design and group design within a university course. In IP&T 515 we participated in weekly seminars with innovators in PBL design. These experts provided case studies and examples of how they had used PBL in university courses. IP&T 664 utilized ongoing group work with the same three to four students to help students present and refine their work throughout the semester. IP&T 538 used various forms of online group work throughout the semester. These courses provided precedents for group design in both in person and fully online courses. In both classes students collaborated throughout the semester to accomplish tasks, which simulated collaborative work done by experts in the field of instructional design.

Extending the unit by one week and increasing synchronous class time gave the time for problem framing and meaningful collaboration in the unit. By utilizing the “Project Groupings” feature of the LMS, along with student information provided to instructors through AIMS, I grouped students according to their content focus (see Figure 2.3). This allowed me to design coursework that would closely simulate the work that practicing teachers perform in Professional Learning

Communities (PLCs) in the field. I used my experience working in public school PLCs over the past 12 years as a model to help design student learning activities that would approximate this type of real-world collaboration. In order to do this well, groups needed to meet together at least twice during the course of the unit. Thus, it was necessary to add a week to the unit design and two additional synchronous meetings (the original design had one synchronous and one asynchronous class).

Figure 2.3 Project Groups



Other small adjustments to the LMS presentation included the addition of links for weekly slides on the homepage and the use of advanced features of Design Tools – the Canvas editing extension, to add accordion tabs, embedded videos and custom color design. At the request of my client I extended this work beyond the CT unit and throughout the entire course.

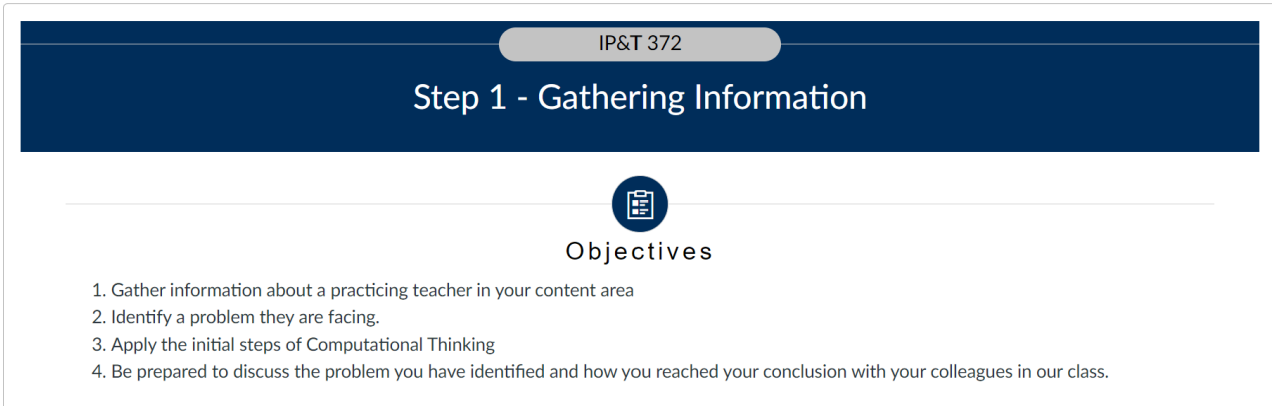
Instructional Moves

As appears in the side by side comparison of Figure 2.1 and Figure 2.2, I made significant changes to the content of the unit. I removed the collaboration board assignment and created a three step assignment that required students to practice the application of CT to a real-world situation, and to collaborate with their peers in a simulated PLC. This decision was based on precedents for creating PBL using strategy problems (Moust et al., 2021, 39).

In week one students complete a reading designed to spark their curiosity about the topic of CT, introduce the steps of CT, and familiarize beginners with key concepts (R2.1). I made few changes to this reading assignment. My changes included adding student objectives to the top of the reading, and fixing some broken hyperlinks. After completing the reading, students began A2.1 Step 1: Gathering Information (A2.1). This assignment is the first in a series designed to (1) scaffold the learning of the CT process, and (2) require students to participate in learning activities that simulate the work of practicing teachers.

The first part of the assignment familiarizes students with their learning objectives (see Figure 2.4). A clear statement of learning objectives at the beginning of reading work and other assignments throughout the unit is integral to the overall redesign of this unit. The objectives stated align with ISTE standards for educators, which was one of the primary objectives of my client.

Figure 2.4 Assignment 2.1 Objectives



The next part of the assignment instructs students to watch a video interview with a teacher who is currently teaching in a high school classroom. Students were instructed to choose the video that matched their content area. The section of my piloted redesign had students in the areas of Physical Education; Science; and Modern, Classical, and Native Languages. As students watched the video their task was to pay attention to obstacles that the teacher describes in meeting learning goals in the classroom (see Figure 2.5). This use of the asynchronous video was to give a context for PBL based on a strategy problem. After watching the videos, students prepared to meet with their peers in class and discuss a problem statement they created based on what they heard the teachers in the interview videos share (see figure 2.6).

In the synchronous online class meeting which followed, students were given fifteen minutes to meet in their PLC groups and discuss what they had seen in the interview videos. I used the Zoom breakout groups feature to place students in their PLC groups. Before starting the PLC meetings, we reviewed expectations for what should be accomplished (i.e. students would (1) share the problem statement they had created and (2) describe their initial steps to move through the CT process. After each student had shared this information, they were to ask each other questions and give each other feedback. As the instructor I used the meeting time to move between groups and listen to conversations. My objective was to gauge if more time was needed in the breakout groups and to identify areas where students seemed to be struggling in the initial steps of the CT process.

In this same synchronous online class meeting I lead students through a guided practice on CT using a real world example based on student survey feedback from Unit 1: Intro to Tech Integration. Here is a link to the Google Slides that were used during instruction and made available to students on the homepage of the course. This guided practice was part of my scaffolded approach to help prepare students to complete the steps of CT independently in the Understanding Computational Thinking Badge. My precedent for this instructional move is thirteen years of classroom teaching. A guided practice is always helpful.

Figure 2.5 - Assignment 2.1 Activity 1

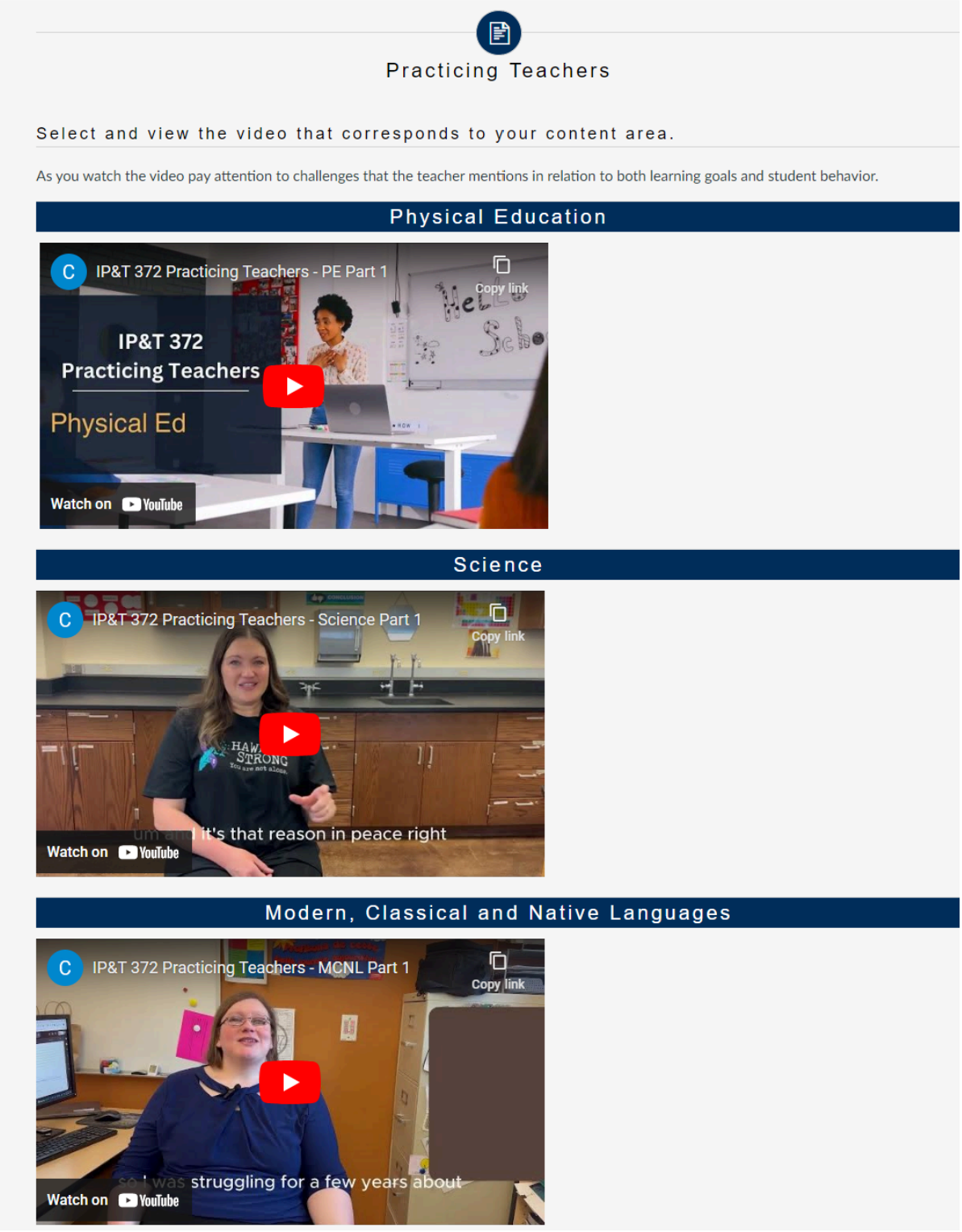


Figure 2.6 - Assignment 2.1 Work Product

Prepare To Meet With Your Colleagues

After carefully considering the information above create a problem statement. This should be one to three sentences in which you clearly articulate **ONE** challenge described by the teacher. Next, deconstruct the problem. Follow the initial steps of Computational Thinking to come to a conclusion about a root cause of the challenge. There may be more than one. For purposes of this exercise identify a **SINGLE** root cause.

Come to next class prepared to share

1. Your problem statement
2. Your deconstruction of the problem
3. Any questions you have for your colleagues.

What You Will Turn In

To complete this assignment you will fill out the Google Doc titled The Root of the Problem linked below.

1. Make a copy of this document for your own Google Drive.
2. Fill in the information requested
3. Make sure you update the sharing settings so that anyone with the link can comment on the document
4. Submit your document here.

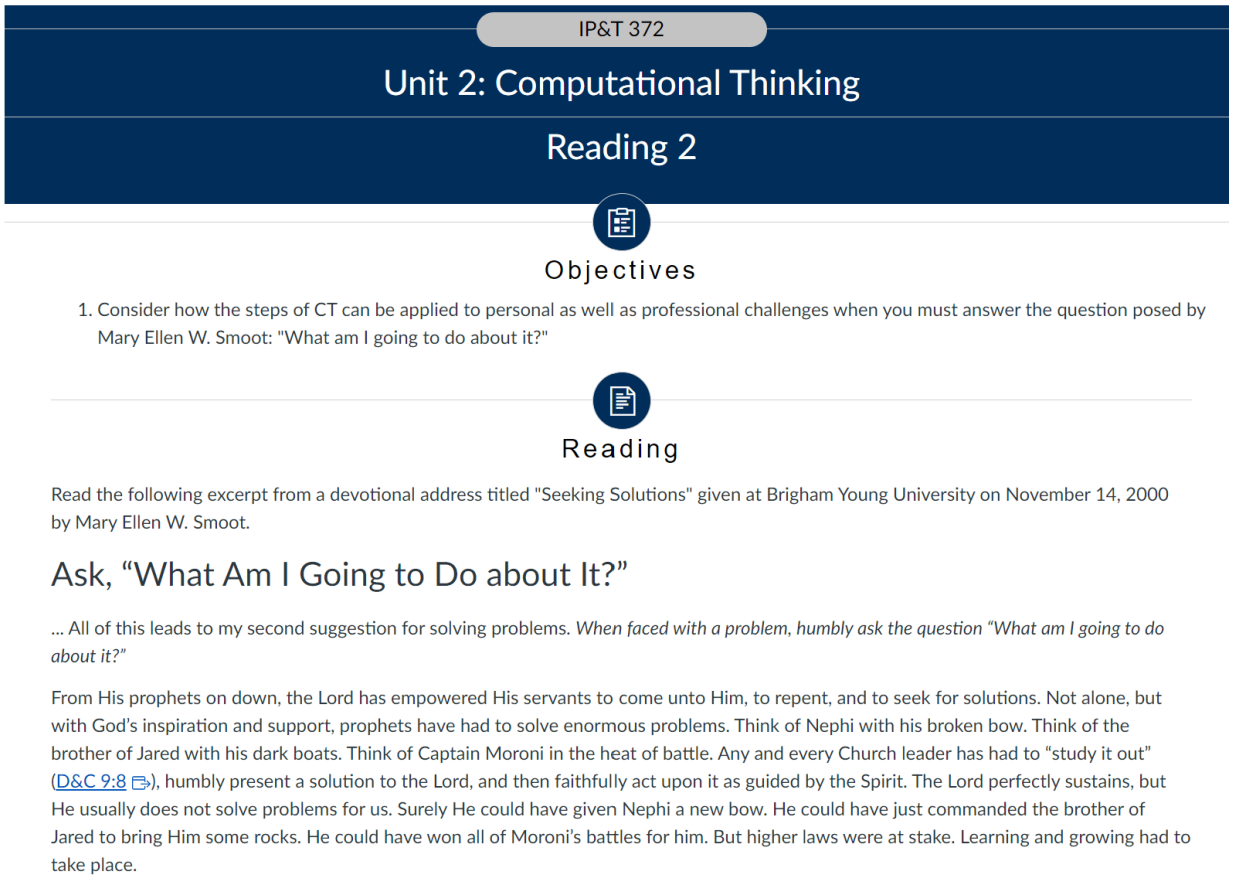
THE ROOT OF THE PROBLEM

[Replace this text with your name and the title of the video you watched]

CT Process Steps	Your Answers
Problem Statement: 2-3 sentences that lay out the problem or challenge you have identified.	
Decomposition: Break the problem down into smaller more manageable parts. What are the components of this problem?	
Pattern Recognition: What repeating patterns do you see in the information provided (repeated words, ideas or concepts…)? Can you see any trends as you consider this information in the larger context of your knowledge about being a classroom teacher?	
Abstraction: Creating a visual model or simulation of a problem that incorporates only the most important details. (You could use a feature such as the "Insert -Drawing" feature of this Google Doc, or include an image of an abstraction you create by hand).	
	Your Questions
Questions you'd like to discuss with your colleagues when we meet together in class.	

In the second week of the course students begin by reading an excerpt from a Brigham Young University (BYU) devotional given by Ellen W. Smoot in 2000 (See Figure 2.7). The addition of this reading into the unit was in line with my client's goals that all units in the IP&T courses be spiritually strengthening, in accordance with the aims of BYU. This reading was carefully selected as part of the overall learning design of the unit because it shows how the principles of CT can be applied to solving both personal and professional problems that students may encounter.

Figure 2.7 Week 2 Reading



IP&T 372

Unit 2: Computational Thinking

Reading 2

Objectives

1. Consider how the steps of CT can be applied to personal as well as professional challenges when you must answer the question posed by Mary Ellen W. Smoot: "What am I going to do about it?"

Reading

Read the following excerpt from a devotional address titled "Seeking Solutions" given at Brigham Young University on November 14, 2000 by Mary Ellen W. Smoot.

Ask, "What Am I Going to Do about It?"

... All of this leads to my second suggestion for solving problems. *When faced with a problem, humbly ask the question "What am I going to do about it?"*

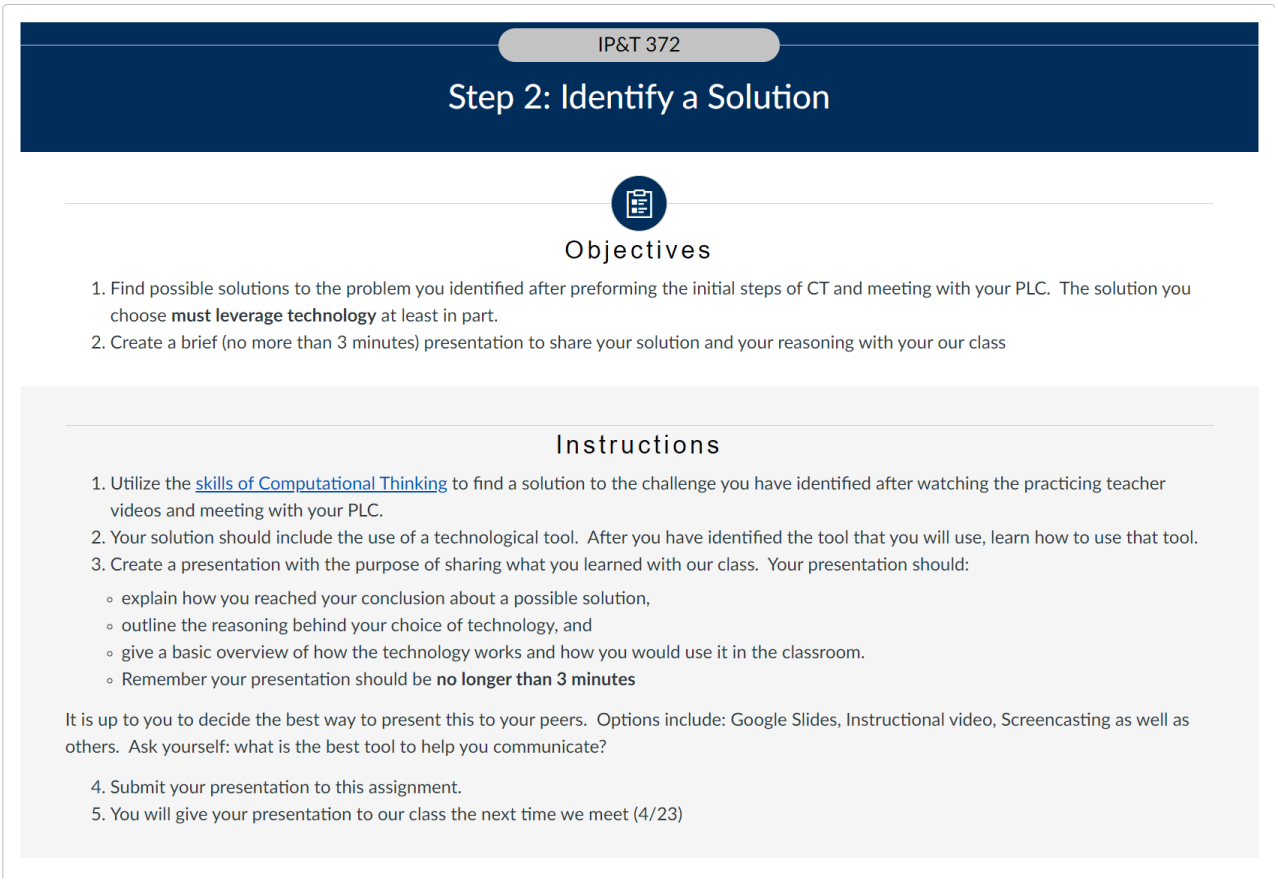
From His prophets on down, the Lord has empowered His servants to come unto Him, to repent, and to seek for solutions. Not alone, but with God's inspiration and support, prophets have had to solve enormous problems. Think of Nephi with his broken bow. Think of the brother of Jared with his dark boats. Think of Captain Moroni in the heat of battle. Any and every Church leader has had to "study it out" (D&C 9:8), humbly present a solution to the Lord, and then faithfully act upon it as guided by the Spirit. The Lord perfectly sustains, but He usually does not solve problems for us. Surely He could have given Nephi a new bow. He could have just commanded the brother of Jared to bring Him some rocks. He could have won all of Moroni's battles for him. But higher laws were at stake. Learning and growing had to take place.

Following the completion of this reading, students worked on A2.2 Step 2: Identifying a Solution (A2.2) (see figure 2.8). The purpose of this assignment was for students to work through the final steps of the CT process and identify a solution to the problem they discussed in their PLC groups in week one. This assignment is a continuation of the strategy based PBL that students began with the "Gathering Information" assignment in week one.

In week two's synchronous online class meeting, students gave a three minute presentation explaining the solutions they had created based on their initial steps of the CT process. Due to the small size of our class in this pilot group (13 students). We were able to have students share their presentations with the whole class rather than just in their PLC groups. They were then able to receive feedback from PLC members as well as other students and instructors. In a larger class these presentations would be done in PLC groups. This was an important opportunity for students to evaluate their solutions..

The next step of the evaluation process was for students to watch part two of the video interviews that they watched in week one. In week three students saw the teachers explain the solutions that they had implemented in their classroom to face the challenges they had spoken about in the first video interview. Students then had the opportunity to compare their own solutions to the teacher's solutions and reflect on similarities and differences; strengths and possible weaknesses of their solutions (see figure 2.9). Due to time constraints there was no formal reflection that students were required to submit . In debriefing with my client after the unit, we agreed that the learning would have been enhanced by a more formal reflection assignment at this point in the unit.

Figure 2.8 - A2.2 Step 2: Identify a Solution



IP&T 372

Step 2: Identify a Solution

Objectives

1. Find possible solutions to the problem you identified after preforming the initial steps of CT and meeting with your PLC. The solution you choose **must leverage technology** at least in part.
2. Create a brief (no more than 3 minutes) presentation to share your solution and your reasoning with your our class

Instructions

1. Utilize the skills of Computational Thinking to find a solution to the challenge you have identified after watching the practicing teacher videos and meeting with your PLC.
2. Your solution should include the use of a technological tool. After you have identified the tool that you will use, learn how to use that tool.
3. Create a presentation with the purpose of sharing what you learned with our class. Your presentation should:
   - explain how you reached your conclusion about a possible solution,
   - outline the reasoning behind your choice of technology, and
   - give a basic overview of how the technology works and how you would use it in the classroom.
   - Remember your presentation should be **no longer than 3 minutes**

It is up to you to decide the best way to present this to your peers. Options include: Google Slides, Instructional video, Screencasting as well as others. Ask yourself: what is the best tool to help you communicate?

4. Submit your presentation to this assignment.
5. You will give your presentation to our class the next time we meet (4/23)

Figure 2.9 Week 3 Reading

IP&T 372

Unit 2: Computational Thinking

Reading 3

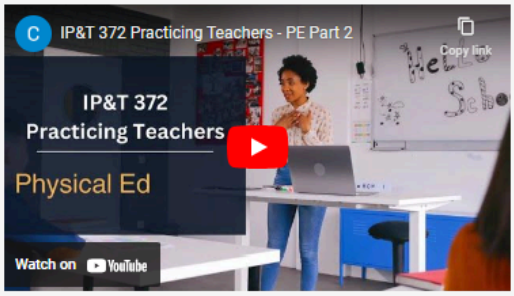
Objectives

1. Be able to list in order, and define the key concepts of Computational Thinking (CT)
2. Compare your solutions to the problems we discussed in week 1 and 2 of the unit with the solutions of a practicing teacher in the field.
3. Reflect on similarities and differences between your solution and the solution of the practicing teacher.

Practicing Teachers Part 2

Watch the Part 2 video of the teacher that you watched in week one of this unit.

PHYSICAL EDUCATION



SCIENCE

MCNL

The final assignments in this unit are the Unit 2 Check-In Quiz and the Understanding Computational Thinking Badge. These two assignments allowed me to gather data on student learning experience, and assess students' ability to successfully complete the CT badge.

Design and Production of Asynchronous Instructional Videos
I created a series of video interviews which I have titled Practicing Teachers. These videos formed an integral part of my instructional plan. In planning and filming these interviews, I referred to chapters in *The Bare Bones Camera Course for Film and Video* and *Teaching With Asynchronous Video (*see annotated bibliography*)*. I also used examples given in IP&T 665: Instructional Visual and Video as product precedents.

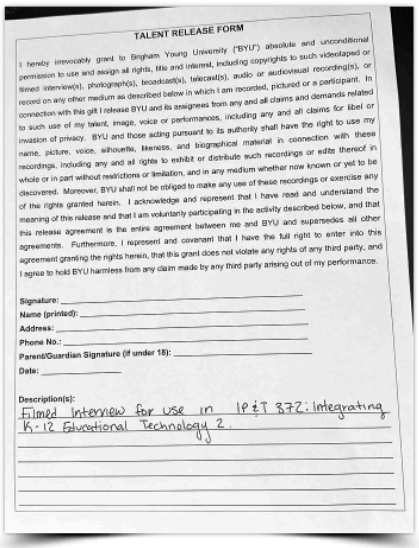
This research and the product precedents that I had for reference influenced my planning, filming and editing of the interviews. From the product precedents in IP&T 665, I knew that I could create a video consistent with my instructional purposes using minimal equipment by following sound principles in pre-production, production and editing. Many of these principles were taken from *The Bare Bones Camera Course for FIlm and Video.* This book gives beginner level instruction on the basics of framing, camera angles, lighting and sound appropriate for an interview.

In post-production and editing I used Chapters from *Teaching With Asynchronous Video* to make decisions about how I would edit videos and integrate them into my redesigned course. The chapters "Let's Discuss Discussions" and "Improving Problem-Based Learning with Asynchronous Video" were especially helpful. My objective was to use these videos as the context to initiate PBL. I incorporated them intentionally to help students participate in meaningful discussions during synchronous meetings and facilitate meaningful thinking and reflection during their individual work.

Figures 2.10, 2.11, and 2.12 below are taken from my online design portfolio. They give a high level overview of the pre-production, production and post-production phases in the creation of the instructional videos that were used in my redesign of the CT unit. These videos can be viewed in full by visiting the Instructional Video page from my online design portfolio.

Student Work Products
In my design organization, assignments fall into one of three categories: Practice, Benchmark, and Mastery. Practice assignments expose students to an idea or help them practice a skill in a low risk situation. Examples of practice assignments in this unit are R2.1, R2.2, R2.3, and A2.1. Benchmark assignments allow a student to apply what they are learning and receive meaningful feedback. Students then identify knowledge gaps and make adjustments and improvements to their thinking and their work. They also allow the instructor to identify areas where students are excelling or struggling, give timely feedback, and help prepare students for their mastery assignment. Mastery assignments, also commonly known as culminating assessments, allow students to demonstrate their overall mastery of content - in this case, mastery of the basic principles of CT. The Mastery assignment for this unit is the Understanding Computational Thinking Badge. Mastery assignments require students to show evidence that they have mastered the learning objectives for the unit, and allow instructors to evaluate whether or not students have met the learning objectives for the unit. Data that will be explained in more detail in the Student Learning Assessment section of this report shows that 83% of students who attempted the Understanding Computational Thinking Badge received a score of 80% or better.

Figure 2.10 Pre-Production of Instructional Videos



TALENT RELEASE FORM

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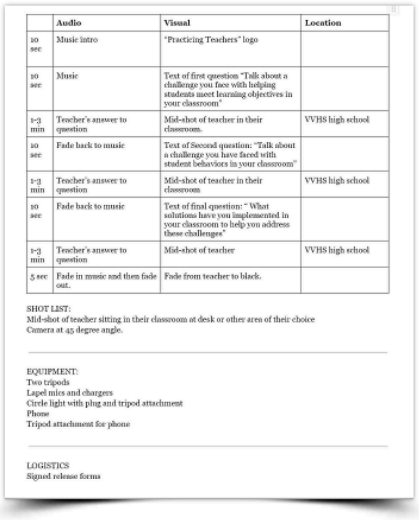
Signature: _____
Name (printed): _____
Address: _____
Phone No.: _____
Parent/Guardian Signature (if under 18): _____
Date: _____

Description(s):
Filmed interview for use in IP&T 372: Integrating K-12 Educational Technology 2.



	Audio	Visual	Location
10 sec	Music intro	"Practicing Teachers" logo	
10 sec	Music	Text of first question "Talk about a challenge you face with helping students meet learning objectives in your classroom"	
1-3 min	Teacher's answer to question	Mid-shot of teacher in their classroom.	VVHS high school
10 sec	Fade back to music	Text of Second question: "Talk about a challenge you have faced with student behaviors in your classroom"	
1-3 min	Teacher's answer to question	Mid-shot of teacher in their classroom	VVHS high school
10 sec	Fade back to music	Text of final question: " What solutions have you implemented in your classroom to help you address these challenges"	
1-3 min	Teacher's answer to question	Mid-shot of teacher	VVHS high school
5 sec	Fade in music and then fade out.	Fade from teacher to black.	

SHOT LIST:
Mid-shot of teacher sitting in their classroom at desk or other area of their choice
Camera at 45 degree angle.

EQUIPMENT:
Two tripods
Lapel mics and chargers
Circle light with plug and tripod attachment
Phone
Tripod attachment for phone

LOGISTICS
Signed release forms

Talent Release

Each participating teacher was required to sign a release stating that Brigham Young University would own all rights to the video in which they would appear

Interview Questions

I worked with my client to create a list of interview questions. I provided these questions to interviewees prior to the day of filming.

Scheduling

Teachers are very busy people! Scheduling time for interviews was challenging. It was important that I could complete the interview in a 15-20 minute period of time.

Planning

I needed to be efficient on the day of filming. This made pre-planning essential. My pre-filming plan included a shot list, equipment list, and "script".

Equipment

Cameras, lights and mics! Part of my approach with this project was to show pre-service teachers that you can make instructional videos with very basic equipment. I had a phone camera, two tripods, a set of lapel mics that connect with my phone, a circle light, and a phone mount. Before shooting I made sure I had all of my equipment ready. I tested everything: lighting, framing, sound levels, set up and take down. The goal was to be as efficient and respectful of my interviewees time as possible

Figure 2.11 Production of Instructional Videos

For this project I interviewed and recorded secondary ed. teachers in the content areas of Biology, Chemistry, Culinary Arts, Forensics, Government/Economics, U.S. History, Modern and Classical Languages, Physical Education, and Spanish. All interviews were filmed over a period of two days. I would arrive in the teachers classroom with my equipment, set up, and spend about twenty minutes with the teacher. It was important to me that these teachers felt valued and respected as experts in their content areas. I worked hard to stay within the time limits I had communicated, and act as an engaged and sympathetic interviewer to help them articulate their ideas.

Interview Clips

Figure 2.12 Post-Production of Instructional Videos

Graphics and Music

As stated in my pre-production list, my approach to this project was to use tools that are accessible to most teachers. I used Canva to create the graphics for these videos and for some of the music.

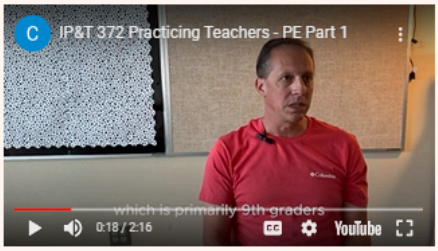
Editing

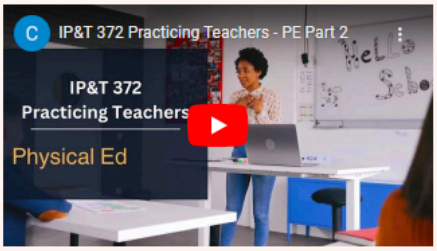
I used CapCut to edit clips together, add music, include transitions, generate captions, and export videos to YouTube.

Instructional Video

Part 1 videos allow students to hear about challenges that practicing teachers face in the field. After listening to these videos students work with colleagues in the class to apply the steps of Computational Thinking by decomposing the problem, recognizing patters, abstracting the problem, and eventually creating algorithm design and planning solutions.

Part 2 videos follow up on this work, allowing students to hear what the practicing teacher has done to resolve challenges, and then reflect and evaluate their own solutions.





Design Process and Evolution

Image by Hans Meier from Pixabay

Arctic terns undertake one of the longest migrations of any animal on Earth. Some of these resilient sea birds have been tracked traveling nearly 60,000 miles round trip. Instead of following a straight path between their breeding and wintering grounds, Arctic terns cut a winding course known as a "meandering migration" (Sartore, n.d.). An Arctic tern's flight on a map might look erratic or inefficient. Similarly, a “migration path” charting the course of my design project on some sort of design process and evolution map, might bring the meandering migration of the tern to mind. However, terns strategically adjust their flight path to take advantage of favorable winds and tide patterns, which help propel them forward to their ultimate goal. Although the tern’s path may seem to be longer than necessary, it really highlights their responsiveness to their ever-changing environment. Similarly, my design path is the result of my ability to respond and adapt to an ever changing set of circumstances.

My design project has undergone significant change from my proposal to this final report; indeed, the overall project for redesigning the IP&T undergraduate courses is still ongoing, and continues to evolve and develop. As mentioned in the “Purpose” section of this report, the story of this project is a story of responsiveness and adaptation.

The Journey Begins

The journey of this project began with a carefully mapped route from start to finish. The original timeline proposed for this project was to begin in March of 2023 and end in June of 2023. Figure 3.1 is the project timeline that was submitted with my project proposal. In March of 2023 I began meeting on a weekly basis with a professor in the IP&T department and an expert designer from BYU Online to begin the process of mapping out the redesign of IP&T 372. I contributed to these meetings by sharing my initial work in the empathy phase of design. This included student survey data, learner personas and environmental analysis. These meetings were an amazing opportunity for me to watch an expert designer facilitate the process of a course redesign. He generously shared forms and procedures with me that are now part of the product precedents that I refer to as an instructional designer. Figure 3.2 is an example of the process and procedures resources that I was introduced to. This process helped me move through subsequent phases of the design process as it became necessary to adapt in response to changing circumstances. With our small design team of three, we created a timeline for redesigning IP&T 372, and planned to pilot the course in the fall 2023 semester.

Figure 3.1 Project Timeline As of March 2023

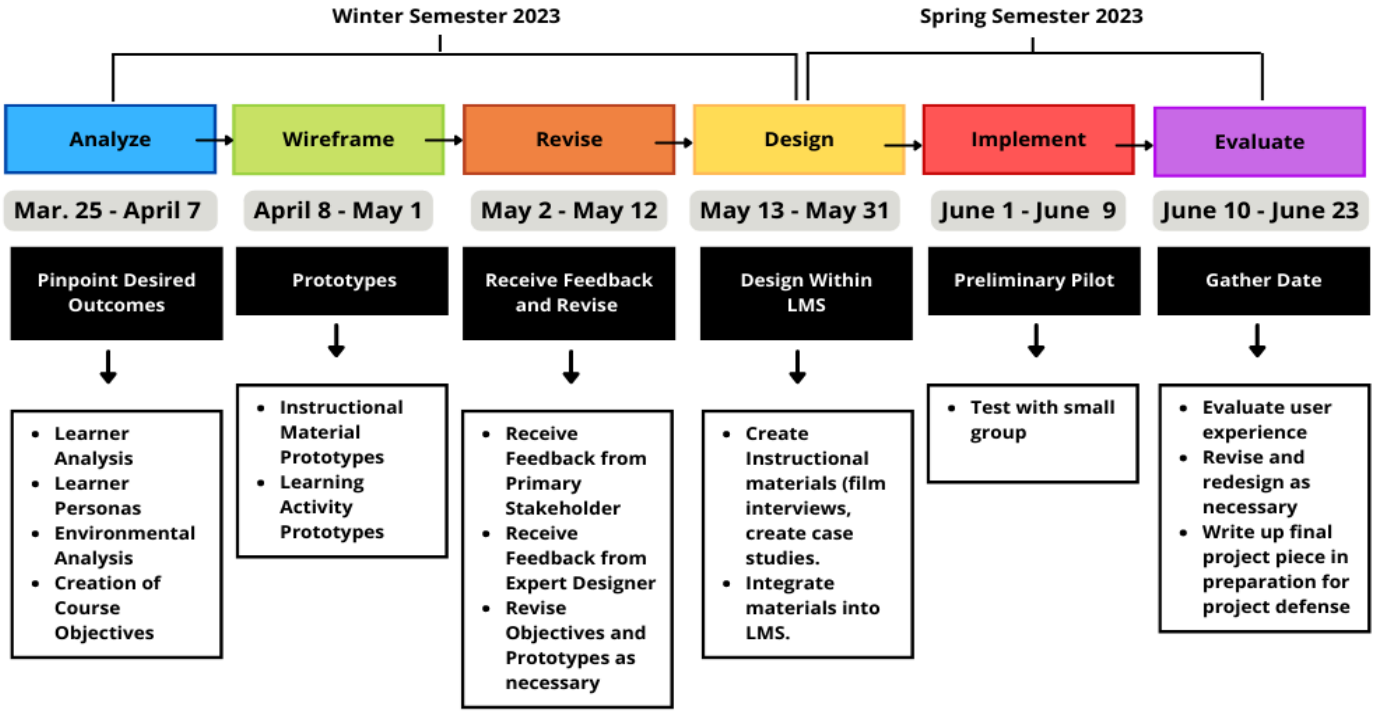


Figure 3.2 BYU Online Design Process

The Winds Of Change

As I was beginning the “wireframe” phase of my design, the trajectory of the project took a huge turn. After careful deliberation, IP&T department leadership and stakeholders came to the decision that not only IP&T 372 would be redesigned, but that the time had come for all three IP&T undergraduate courses to undergo redesign. This new direction brought significant change to the next phase of my project.

I was now working with a new client, new stakeholders and a revised end goal. In response to these changes I adjusted my course. My initial empathy/analysis work was still useful and important to the design moving forward, however it became necessary to revisit the creation of course objectives. The priority for my client was to identify new course objectives for all three IP&T undergraduate courses that were vertically aligned, and that aligned with ISTE standards for educators. This brought an exciting opportunity to work with a larger redesign team that consisted of several IP&T faculty, Masters students, and an expert designer from BYU Online.

I worked with a fellow IP&T Masters student to create a Google Sheets format that allowed us to collaborate effectively with professors and stakeholders to map current coursework alignment with the ISTE standards (see Figure 3.3). This analysis led to several important insights. First, we learned which ISTE standards were being met within the current curriculums and which were not. Second, it gave us an important look at the vertical alignment between the curriculums for the three IP&T courses. The information from the standards alignment analysis would later become a critical data piece for our client as he worked to combine the three separate courses into two. It was also critical information for me at a later point of my project, as I worked on creating learning objectives for the unit that I would eventually redesign.

As we compiled this data, I worked concurrently with my client to analyze how to improve course materials. I prototyped learning activities, materials, and LMS designs. I created two separate Sandboxes on Canvas. In one sandbox, I prototyped a fully asynchronous version of IP&T 372 complete with weekly activities and instructional videos that was shared with my client and other stakeholders. Figure 3.4 and 3.5 provide a snapshot of that work. Here are the links to the asynchronous instructional from week six that appear in figure 3.5: (1) Nearpod, (2) Video Instructions. In the other sandbox I worked on creating modules for CT and Design Thinking (DT) that were aligned with ISTE standards and that incorporated PBL and intentional group design.

At this point in the ongoing work of the redesign team, IP&T department leadership made the decision to change the IP&T undergraduate offerings from a three course series to a two course series. I again found myself facing a new path on my journey.

Figure 3.3 Standards Alignment Document

ISTE Educator Standards	IP&T 371	IP&T 372	IP&T 373	H. Project	Unit/Module	Learning Activity
2.1 Learner - Educators continually improve their practice by learning from and with others and exploring proven and promising practices that leverage technology to improve student learning. Educators:				*As Proposed. Subject to change		
2.1.a Set professional learning goals to explore and apply pedagogical approaches made possible by technology and reflect on their effectiveness.	☑	☑	☐	☑	371-11 372 - 4	https://edtechbooks.org/k12handbook/lifelong_learning/simple **Hatch Projcet** - This is basically the purpose of the whole project **372** - Instructional Video Unit - Students explore how instructional video could aide their pedegogy and reflect on their effectivnesss in creating an instructional video
2.1.b Pursue professional interests by creating and actively participating in local and global learning networks.	☑	☐	☐	☐	371-11	371: PLN Participation and Profile
2.1.c Stay current with research that supports improved student learning outcomes, including findings from the learning sciences.	☐	☑	☐	☐	372 -Unit 1	**372** - Computational Thinking, Design Thining Maker Spaces - Students explore research about how this type of learning and instruction improve learning outcomes for students
2.2 Leader - Educators seek out opportunities for leadership to support student empowerment and success and to improve teaching and learning. Educators:						
2.2.a Shape, advance and accelerate a shared vision for empowered learning with technology by engaging with education stakeholders.	☑	☐	☐	☑	371-1	Effective Technology Integration **Hatch Project** - Students engage with practicing teachers and with ther classroom colleagues to create more effective technology infusion.
2.2.b Advocate for equitable access to educational technology, digital content and learning opportunities to meet the diverse needs of all students.	☑	☐	☐	☐	371-6	Universal Design for Learninng
2.2.c Model for colleagues the identification, exploration, evaluation, curation and adoption of new digital resources and tools for learning.	☑	☐	☐	☑	371-12	Evaluating Online Resources **Hatch Projcet** - This is the main purpose of PLC meetings as outlined in originial project proposal
2.3 Citizen - Educators inspire students to positively contribute to and responsibly participate in the digital world. Educators:						
2.3.a Create experiences for learners to make positive, socially responsible contributions and exhibit empathetic behavior online that build relationships and community.	☑	☐	☐	☐	371-9, 10	Online Professionalism (change to focus on the students) https://edtechbooks.org/k12handbook/online_professionalism/simple Online Safety
2.3.b Establish a learning culture that promotes curiosity and critical examination of online resources and fosters digital literacy and media fluency.	☐	☐	☐	☑		**Hatch Project** - Students will engage in creative problem solving and explore online resources to find the best solutions.
2.3.c Mentor students in safe, legal and ethical practices with digital tools and the protection of intellectual rights and property.	☑	☑	☐	☐	371-13, 14 372 - Unit 4	371: Copyright and Open Educational Resources 372 - Creative Commons and Copyright
2.3.d Model and promote management of personal data and digital identity and protect student data privacy.	☑	☐	☐	☐	371-9, 10, 11	371: Digital Presence; Digital Footprint Inventory; Getting to Know AUPs and Terms of Use
2.4 Collaborator - Educators dedicate time to collaborate with both colleagues and students to improve practice, discover and share resources and ideas, and solve problems. Educators:						
2.4.a Dedicate planning time to collaborate with colleagues to create authentic learning experiences that leverage technology.	☑	☐	☐	☑	371-3, 4	371: Crowd-source activity; also could incorporate the breakout room activity for lesson plan 1 that I use in my sections of the course (which would probably be a better match than the crowd-source activity alone) **Hatch Project** - Student participation with peers in PLC
2.4.b Collaborate and co-learn with students to discover and use new digital resources and diagnose and troubleshoot technology issues.	☐	☐	☑	☐	373	373 Project - Learning Playlist
2.4.c Use collaborative tools to expand students' authentic, real-world learning experiences by engaging virtually with experts, teams and students, locally and globally.	☐	☐	☐	☐		
2.4.d Demonstrate cultural competency when communicating with students, parents and colleagues and interact with them as co-collaborators in student learning.	☐	☐	☐	☐		
2.5 Designer - Educators design authentic, learner-driven activities and environments that recognize and accommodate learner variability. Educators:						
2.5.a Use technology to create, adapt and personalize learning experiences that foster independent learning and accommodate learner differences and needs.	☑	☐	☑	☐	371-4, 7 373	371: Lesson Planning with Technology & UDL (adaptations requirement in lesson plan 1; also UDL lesson plan fits this somewhat) 373 Project - Personalized Learning Playlist 372 -
2.5.b Design authentic learning activities that align with content area standards and use digital tools and resources to maximize active, deep learning.	☑	☐	☑	☐	371-4, 7 373	371: Lesson Planning with Technology, UDL Lesson plan (both lesson plan assignments mostly fit this, but could use a bigger emphasis on "active, deep learning") 373 Project - Quiz, Playlist, Discussion
2.5.c Explore and apply instructional design principles to create innovative digital learning environments that engage and support learning.	☐	☐	☑	☐	373	373 Project - LMS unit
2.6 Facilitator - Educators facilitate learning with technology to support student achievement of the ISTE Standards for Students. Educators:						
2.6.a Foster a culture where students take ownership of their learning goals and outcomes in both independent and group settings.	☑	☑	☑	☑	371-7 372 - Unit 5	371: UDL lesson plan does this somewhat, but could focus more on the specific parts of this standard **372** - Selecting standards focus - students select badges based on the standard they most desire to improve their skills in. **Hatch Project** - Students will work independently and in groups to identify growth goals for themselves as instructors
2.6.b Manage the use of technology and student learning strategies in digital platforms, virtual environments, hands-on makerspaces or in the field.	☐	☑	☑	☑	372-3 373	373 Project - LMS unit **372** - Partially covered in the "Passion Project" assignment where they learn about makerspaces, and write a brief paper about them **Hatch Project** - Cell phone behavior and use plan
2.6.c Create learning opportunities that challenge students to use a design process and computational thinking to innovate and solve problems.	☐	☐	☐	☑	372-2	**372:** Collab Board 2, Understand Computational Thinking Badge **Hatch Project** - Students use CT or DT to solve an insturctional problem
2.6.d Model and nurture creativity and creative expression to communicate ideas, knowledge or connections.	☐	☐	☐	☑		**Hatch Project** - Students will present questions, ideas and findings to peers
2.7 Analyst - Educators understand and use data to drive their instruction and support students in achieving their learning goals. Educators:						
2.7.a Provide alternative ways for students to demonstrate competency and reflect on their learning using technology.	☑	☑	☐	☐	371-4, 7 372 - Unit 3	Lesson Planning with Technology & UDL **372** - Makerspaces/STEAM
2.7.b Use technology to design and implement a variety of formative and summative assessments that accommodate learner needs, provide timely feedback to students and inform instruction.	☑	☐	☑	☐	371-4, 7 373	Lesson Planning with Technology & UDL 373 Project - Quiz/Data Practices
2.7.c Use assessment data to guide progress and communicate with students, parents and education stakeholders to build student self-direction.	☐	☐	☐	☐	373	373 Project - Quiz/Data Practices
					372 - Unit 5	**372:** It should be noted that 372 has a corresponding set of badges for each of 7 general standards, but students choose 1 of those 7 to focus on

Figure 3.4 Prototypes Dashboard

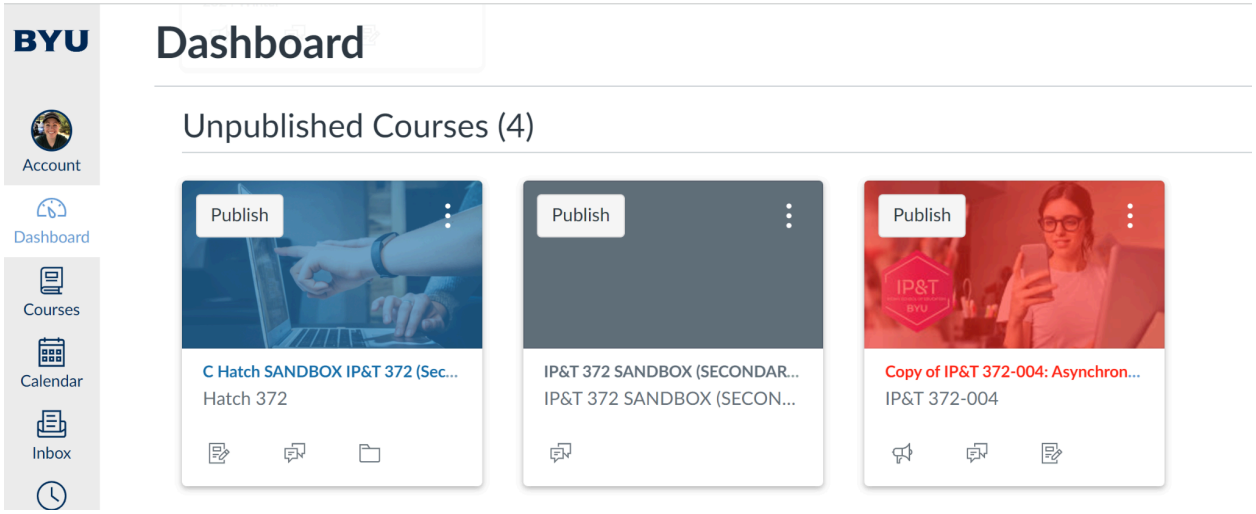


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Figure 3.5 Prototype of Fully Asynchronous Course - Unit 4

UNIT 4: Instructional Video

Date and Mode	Unit 4 Readings	Unit 4 Assignments	Unit 4 Badges
Week 6: October 9-14 WEEK 6 Materials Nearpod slides for Copyright and Creative Commons Instructional Video Badge Instructions	R4.1 Copyright and Creative Commons in Multi-media Projects	A4.2 Select Your Instructional Video Badge Option	Start working on your Chosen Instructional Video Badge
Week 7: October 16-21	N/A	A4.3 Unit 4 Check-in	Continue working on your Chosen Instructional Video Badge
Week 8: October 23-28		N/A	B4.1 Instructional Video Badge Choice Due by Oct 28

The Turn Of The Tide

The change from a three course series to a two courses series meant that (1) the course I was helping to redesign would be merged with the two other IP&T courses, and (2) the timetable for this project was now extended far beyond my original proposed timeline. The new target date for piloting the redesigned courses was August of 2024—an entire year later than the date that I had proposed to finish my project, and many months outside of the suggested timetable for completion of a Masters project. This required further adaptation.

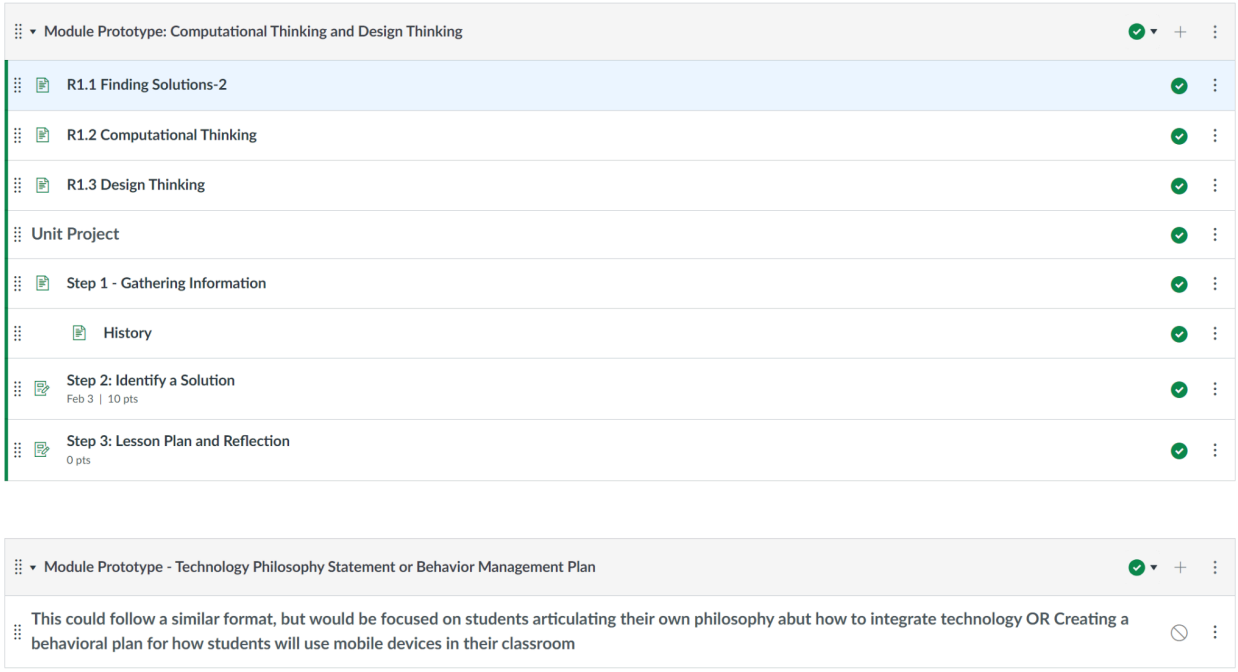
As a result of these new circumstances, rather than redesigning an entire course, my project purpose was now to redesign a single unit. This unit could be used in either of the two IP&T courses that would be piloted in fall of 2024. It was decided that I would co-teach a section of

IP&T 372 in the Winter of 2024, and pilot a redesigned Computational Thinking unit in that section. My client would be my co-teacher, and would be able to see how the redesign fit within the existing curriculum and how it might form a part of the redesigned courses.

The Final Destination

The design phase for this redesigned unit included filming interviews, creating learning materials and refining LMS design. I continued to work in the Canvas sandbox to prototype and refine. See Figure 3.6 for an early prototype of the module view of the redesigned IP&T 372 Unit. I was able to complete my final design within the existing IP&T 372 course in time for it to be piloted in February of 2023

Figure 3.6 Module Prototype



Product Implementation

My unit design was piloted in the Winter 2024 semester. As described above it was integrated into an already existing course, IP&T 372. Students accessed the unit as a synchronous online module within a Canvas course. Our class met synchronously via Zoom every Tuesday from 4:00–4:50 PM, MST during all three weeks of the unit. My unit followed the procedures established for the course within the course syllabus: namely, that students were to read all materials listed for the week prior to Tuesday's synchronous online meeting, and all assignments were due by 11:59 PM on the Saturday of the assigned week.

In order to access the course students needed access to a computer, laptop or phone that had reliable internet access, access to the online Canvas course, and access to Zoom meetings. In order to complete and turn in the assignments in the unit students needed access to their Google Drive, Google Slides and Google Docs.

I worked with my client to create a Google Slides presentation that walked students through all of the necessary steps to participate successfully in the essential aspects of the online course. These instructions were for the entire course, which included my redesigned unit.

Assessment of Student Learning

Procedures

The overall learning objective for students was to complete the Understanding Computational Thinking Badge with a score of eighty percent or better. Procedures for determining the degree to which students met learning objectives involved a series of formative and summative assessments. These assessments were administered as assignments within the unit. Each week students were responsible to complete one or more tasks that were then either graded or informally assessed by the instructor. At the end of the unit, students were also surveyed about their learning experience and asked to reflect on whether or not they were able to reach the unit's learning objectives.

Formative and Summative Assessments

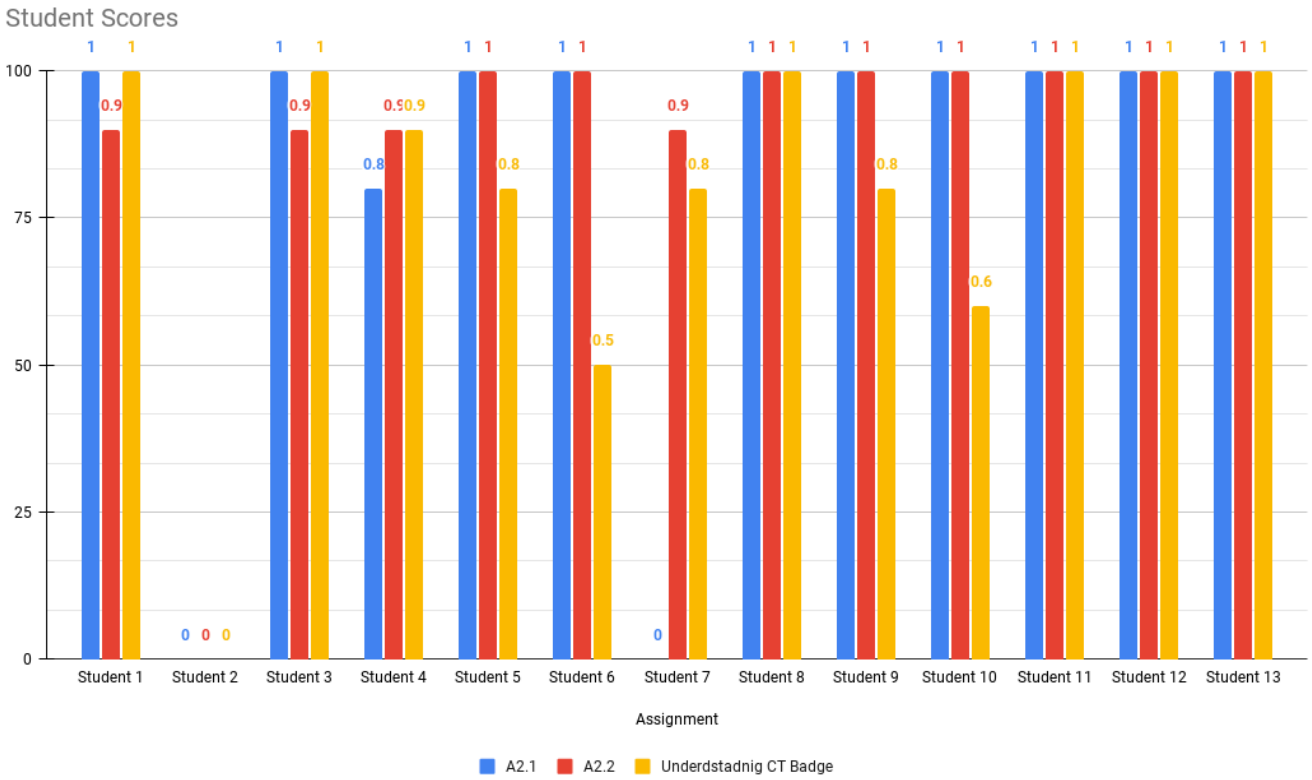
The unit contained two primary forms of formative assessment: (1) student participation in PLC meetings during synchronous class time, and (2) student participation in class discussion during synchronous Zoom meetings. As one of the course instructors, I informally assessed students during these activities; I observed students in their PLC meetings, and looked for evidence of student understanding or lack of understanding of the initial steps of CT. I then used that information to inform in-class instruction. For example, I saw that many students were struggling to understand the concept of decomposing a problem. In their PLC meetings many students were identifying broad problems, such as "this teacher's problem is that students don't participate in class activities", and then failing to continue the decomposition process to find specific roots of the problem. I used that information to inform my instruction during synchronous class time. As such, I spent more time going over examples of problem decomposition that demonstrated how to break down a broad problem into smaller pieces and choose a single element to focus on when seeking a possible solution. The formative assessments of the redesigned unit are a key opportunity to respond to student's learning needs and give students real-time feedback.

The unit's summative assessments are A2.1, A2.2 and the Understanding Computational Thinking Badge. A2.1 and A2.2 are assignments that scaffold the process of CT. A2.1 requires students to listen to a practitioner in their field of study discuss challenges that they are facing and then move through the CT steps of decomposition, pattern recognition and abstraction. Students demonstrated their understanding of these initial steps by filling out a Google Doc template (see figure 2.6). A2.2 required students to complete the steps of the CT process (algorithm design, and evaluation) and articulate their findings to the class in a three minute presentation. Students received grades and feedback on A2.1 and A2.2 before completing the badge assignment. These two summative assessments showed students where they were meeting the learning objectives and where they needed to reevaluate their thinking and search for more information. The submission form and rubric for the Understanding Computational Thinking Badge are found on the badgr.com site. The Understanding Computational Thinking Badge is found under the issuer Badgrschool.

Figure 4.1 below is a visual breakdown of student grades on all three summative assessments in the redesigned unit. This chart shows several important pieces of data:

- 83% of students who attempted the badge received a score of 80% or higher.
- 17% of students who attempted the badge received a score lower than 80%. Student 6 received a 50% because the badge was only partially completed. Student 10 completed the badge, but did not demonstrate mastery of concepts.
- One student did not attempt any portion of the assignments in this unit.

Figure 4.1 Student Scores On Summative Assessments.



Analysis of Student Feedback

In the initial steps of my project I analyzed student survey data and reached the conclusion that many students came into IP&T 372 with no clear idea of the objectives of the course, or how it would be valuable to them in their career as an educator. Based on these conclusions I suggested to my client that PBL would be a learning design theory that would fit well into the course redesign.

At the end of the unit students were surveyed and asked to reflect on how they could apply what they learned in their work as teachers, which learning activities they found to be the most helpful, and what things would have helped them learn even more effectively.

Samples from student responses:

- “I liked A2.1 and 2.2 because I had to actually apply the concepts from Computational Thinking, which helped me better understand them. It's nice also talking to other students about the process in class.”

- “I really liked the readings and devotional readings this week, because they talked about computational thinking very simply and used real-world examples that allowed me to better understand the topic. I enjoyed the exercise where I could apply these concepts to my own teaching and courses.”

- “I feel that the assignment as a whole on computational thinking is great as well as the activities. The videos are great because for the first time in a technology class we have something that is somewhat geared towards physical education even though it is a problem we are facing all the time in the classroom.”

- “I think that it might have been a better use of our time to just post the power points we made and then to go through and look through others from the class and comment on them. I just have a hard time listening to powerpoint after powerpoint.

- “The only thing that is more difficult to figure out is the grouping system and meeting groups. Especially when they are so small— part of me wonders if I learn more from a larger group or if it were more a general response than just within the few people we have.”

- “I was a little bit confused on the assignment where we watched the video and had to break down the problem in the table. I think maybe doing an activity like this in class would be helpful just to help grasp the idea before we go and do it ourselves.”

- “I loved having the opportunity to listen to the problems of other teachers in our field of study and practice using computational thinking to find a solution. I felt that this activity was very hands-on as well as SUPER relatable and realistic. I was able to put myself in the shoes of that teacher and think about how I would go about solving this problem.”

According to their feedback many students were able to see that the activities of the unit contributed to the acquisition of skills that are directly transferable to their work as practitioners in the classroom. Based on student feedback, I conclude that for most students the use of PBL design in the unit contributed to knowledge building that they saw as authentic and useful. Some students had constructive feedback about group work. While some felt that groupings were too small, others felt that certain whole class activities were too large. The grouping system is something that needs more refinement. I firmly believe that there is power in intentional groupings and using group work in online classes to create learning communities.

Product Evaluation

Online Course Design

In addition to assessing student learning, my unit design was evaluated by experts in the field of online instructional design. I worked with a senior instructional designer from BYU Online, and with a member of his team to receive feedback on my project. They put my unit/module through

the same initial evaluation process that is used to assess all of BYU Online's courses when they are piloted. Appendix B is a copy of the design rubric with expert feedback and designer notes. I was able to use this evaluation to make important improvements to my course design. After meeting with the experts in the field I revised the language of course objectives and improved accessibility. I was also able to take the feedback from this rubric to my client. Several pieces of feedback referred to elements of the course design that were outside of the scope of my project, but provided useful information to my client.

Outcomes

The outcome of the unit was that eighty-three percent of students were able to successfully meet the course learning objective. Students were also able to see real-world value in the learning process and apply the concepts of CT to real-world situations. My client was able to experience the unit as it was being piloted. He attended all Zoom meetings, had real-time access to student work products, and has been given access to all BYU Online evaluations.

As the project of redesigning all IP&T undergraduate courses continues to evolve, the work I have completed in this project will be subject to additional revision. However, this project has provided my client and other stakeholders with an important prototype that can be used to inform their learning design as they prepare to pilot the new IP&T 300 level courses.

Budget and Timeline

In my original proposal I estimated that my project would span 13 weeks and cost a total of $3,575. I arrived at these figures by mapping out the project timeline using the organization map shown in Figure 3.1, and adding together the working hours that would be required. I estimated that I would bill 130 hours as a research assistant earning eighteen dollars an hour. At this rate the total cost to the university would have been $2,340. I estimated that I would be working with a designer from BYU Online for one hour every one to two weeks. BYU Online instructional designers at the time of my inquiry were paid ninety-five dollars an hour. Thus, the maximum cost for an expert designer on this project would be $1,235. Other than the cost of labor there were no significant costs in my proposed budget. IP&T 372: Integrating K-12 Educational Technology 2 was operating as a fully online course prior to the redesign, and therefore would cause no change in the hosting fees paid by BYU.

Remember the Arctic tern? Because this project took so many turns the timeline and budget are both well outside of what I originally proposed. This project ended up spanning a year, requiring many more resources and much more manpower than what my original proposal factored.

My work on this project is between 250 and 300 hours. I met one on one with a senior designer to specifically talk about my project for a total of about 2 hours. I also met with a junior designer for an hour. Other than the hourly wages of those working on the project there are no other significant costs. I made small investments in tripods, camera mounts, microphones and lighting equipment, totalling around 50 dollars. For the work that impacted my project specifically I estimate a cost of $5,000. Of course, the cost of the overall redesign of these courses will be much higher.

Annotated Bibliography

Domain Knowledge

To successfully complete my project, I needed to strengthen my knowledge of CT, ISTE standards for educators, filming for instructional videos and facilitating online learning. The sources listed below were the resources that shored up my foundations as I moved through the work of my design.

Graham, C. R., Borup, J., Short, C. R., & Archambault, L. (2019). K-12 Blended Teaching: A Guide to Personalized Learning and Online Integration (1st ed.), 1. EdTech Books. https://dx.doi.org/10.59668/2

As part of my project, I became an instructor in an online course that blends synchronous and asynchronous online work. I had many questions about how to design for and teach in this environment: e.g. What are strategies for effective online discussion? What are the best practices for using asynchronous technologies and activities? How can I help students feel connected to me as the instructor in online spaces? Although this chapter is geared towards K-12 educators, the principles were very applicable to my post-secondary class. Graham et al. provide evidence-based strategies for both designing and teaching in blended learning environments. I found their work on facilitating online discussions to be particularly useful as I worked to create authentic group interactions in my course design.

Hunsaker, E. (2020). Computational Thinking. In A. Ottenbreit-Leftwich & R. Kimmons (Eds.), *The K-12 Educational Technology Handbook*. EdTech Books. https://edtechbooks.org/k12handbook/computational_thinking

This chapter in the book *Educational Technology Handbook* uses a combination of text, video and instructional graphics to define CT. It details the advantages of including the teaching of CT into both elementary and secondary classrooms citing studies that link CT to improve student engagement, motivation, problem-solving and academic performance. This chapter was key to my understanding of what CT is and how it can be taught. Hunsaker provides multiple resources to help instructors who want to teach CT. This chapter was integral to the creation of student readings about CT and was made available to students as a supplemental reading should they desire to learn more.

Trust, T. (2018). 2017 ISTE standards for educators: from teaching with technology to using technology to empower learners. *Journal of Digital Learning in Teacher Education*, 34(1), 1–3. https://doi.org/10.1080/21532974.2017.1398980

In this article, Smith discusses revisions made to the International Society for Technology in Education (ISTE) standards for educators. The author highlights the significant changes in educational technology since the initial standards were published in 2008, emphasizing the emergence of new devices, tools, and online platforms. The article explains how the 2017 ISTE Standards shift towards using technology for learning, collaboration, leadership, and student empowerment. Each of the seven themes of the standards (Learner, Leader, Citizen, Collaborator,

Designer, Facilitator, and Analyst) is discussed in detail, with examples of how educators can integrate technology to meet these standards. CT is part of the ISTE standards for students, but in this project my objective was to familiarize myself with the ISTE standards for educators, and create a unit that aligned with those standards, requiring students to use skills that ISTE had identified as essential competencies for educators.

Schroeppel, T., & DeLaney, C. (2015). *The Bare Bones Camera Course for Film and Video*. Allworth.

Schroeppel and DeLAney give a practical guide on filmmaking for beginners. The book covers a wide range of topics essential for understanding camera operation and video production, starting from basic terminology and equipment to more advanced concepts like composition, lighting, sound, and editing. This guide was the perfect resource for me as a beginner in creating instructional videos that involved the art of storytelling through film. I referred to this guide when creating the asynchronous videos that became a key piece in my redesign of IP&T 372

Learning Theories

The guiding question to my theoretical research was: what design moves will facilitate the formation of communities of practice in an online course that blends synchronous and asynchronous instruction? The research detailed below led me to the conclusion that asynchronous technologies, such as Google Apps, Perusall and Voicethread can facilitate teamwork in asynchronous spaces, and that careful group design is a key part of instructional design when the designer wishes to encourage communities of practice.

Blau, I., & Shamir-Inbal, T. (2018). Digital technologies for promoting ‘‘student voice’’ and co-creating learning experience in an academic course. *Instructional Science, 46*(2), 315-336. https://doi.org/10.1007/s11251-017-9436- y

In this case study, authors concluded that the use of Google Apps for Education positively impacted classroom community by creating an “equalization effect”, among students and between the students and the instructor (p. 332). Digital technologies allowed students not only to collaborate while learning course content, but also to use Google Apps for Education to edit and update course content. Together students created learning outcomes through continuous dialogue facilitated by the technology-enhanced interaction between groups of students, and between students and the instructors. Blau and Shamir (2018) found that the overall effect was to promote students’ voices and create a community of practice with “diminished differences between the students”, and one which “opened the window for more equal learning experiences and active participation in the course activities” (p. 332).

Flener-Lovitt, C., Bailey, K., & Han, R. (2020). Using structured teams to develop social presence in asynchronous chemistry courses. *Journal of Chemical Education, 97*(9), 2519-2525. https://doi-org.erl.lib.byu.edu/10.1021/acs.jchemed.0c00765

In this exploratory study, a structured collaborative teams approach was applied to two asynchronous chemistry courses at two different institutions: a public two-year college and a public four-year institution. The researchers found that groups became more self-sufficient and

interdependent as the semester went on, needing less support or direct intervention from the instructor. Students were also able to complete the same work as peers in face-to-face classes with no significant deviation in performance, and students working with the team approach in an asynchronous course were able to complete that same work in a faster time frame. The structured groups had four rotating roles (manager, recorder, reflector, and encourager), group sizes were kept to a maximum of four members, and groups were carefully selected rather than randomly assigned. In addition, instructors modified groups in the first two weeks of class to maximize the desired group dynamics, and group roles were rotated at the start of each new module.

Jiang, W. (2017). Interdependence of roles, role rotation and sense of community in an online course. *Distance Education, 38*(1), 84-105.

In this qualitative study, Jaing (2017) hypothesized that designing highly structured groups within an asynchronous online undergraduate communications course at a public university would lead to an increased sense of community among students. Groups were designed with eight to ten randomly assigned students. Within each group were four different discussion roles (starter, wrapper, moderator, and participant) which would rotate each week. Student roles were designed to be interdependent, and descriptions of student roles were carefully outlined in course materials. Student interviews at the end of the study revealed that when group norms were followed there was indeed a greater sense of community for the students in that group. However, when students failed to participate or participated late, their group mates reported feelings of sharp contrast to the desired sense of community; such as isolation, lack of feedback, and frustration (p 99-100).

Kerrigan, J., & Andres, D. (2022). Technology-Enhanced communities of practice in an asynchronous graduate course. *Journal of Educational Technology Systems, 50*(4), 473-487. http://dx.doi.org.erl.lib.byu.edu/10.1177/00472395221079288

In their 2022 study, Kerrigan and Andres found that the use of Perusall and Voicethread in combination with Google Slides improved interactions both among learners and between learners and content. According to Kerrigan and Andres (2022), the combination of Google Slides and Voicethread can be used to create a virtual community of practice by allowing students to co-create products and presentations. Authors of this study also found that dividing students into small groups of three or four members and assigning them to complete readings and annotations through Perusall allowed for “peer-to peer learning in small CoPs”, which eliminated the problem of a few dominant voices silencing other students during whole class discussions (p. 484).

Instructional Design

Moust, J., Bouhuijs, P., & Schmidt, H. (2021). Introduction to Problem-Based Learning. Taylor & Francis Group.

I was introduced to this book as part of my coursework in IP&T 515: PBL. When I began my design project I returned to Chapter 2: Learning through problems. This chapter discusses types of problems used in the design PBL, the three most common being: explanation problems, strategy problems and dilemma problems. The authors explain that strategy problems are those that “focus on the activities of a professional practitioner”(38). I used this as a guide when creating the

design for my practicing teacher videos and the activities that students would use to learn from problems faced by these practitioners.

Svihla, V. (2021). Problem Framing. In J. K. McDonald & R. E. West (Eds.), Design for Learning: Principles, Processes, and Praxis. EdTech Books. https://edtechbooks.org/id/problem_framing.

In this chapter authored by Svihla (2021) and included in the book *Design for Learning: Principles, Processes, and Praxis*, the focus is on the concept of problem framing within the context of learning design. Svihla emphasizes the essential importance of properly defining and framing problems, particularly in the realm of educational design, where solutions are not always straightforward. The chapter provides a detailed exploration of problem framing, including its definition, importance, and practical implications for instructional designers through vignettes and examples. This quote from the chapter was a guiding light for me as my design went through multiple challenges and changes: “While problem framing is typically treated as something that happens at the beginning of a design project, it is important to remember that it is a process that continues until the design is finalized”. I found problem framing to be a process that was fairly continuous for me during the course of my design.

West, R. E., & Borup, J. (2021). Teaching With Asynchronous Video: Strategies for Online Practitioners. EdTech Books.

One of my design objectives was to use asynchronous videos to allow students to work through a strategy problem, and participate in meaningful discussions during synchronous meetings using these asynchronous videos as context. I referred to *Teaching With Asynchronous Video* to make decisions about how I would edit videos and integrate them into my redesigned course. The chapters “Let’s Discuss Discussions” and “Improving Problem-Based Learning with Asynchronous Video” were especially helpful. For example, my decision to have students meet in person for PLC discussions rather than using asynchronous methods for video annotation was influenced by this source's guidelines for when *not* to use asynchronous video. Additionally the insights on how to use video as a “trigger” for PBL were utilized in the way that I incorporated the filmed teacher interviews into the course.

Design Knowledge and Critique

The experience of working on a long term design project results in substantial design knowledge growth. It is experiential learning, and experience exposes us to complexity in a way that engages the embodied learner. It requires us to use every tool that we possess, and to search out tools that we have not previously obtained in order to find answers, solutions and a way forward. The following sections relay understandings and rules of thumb that I have gathered over the course of my design project.

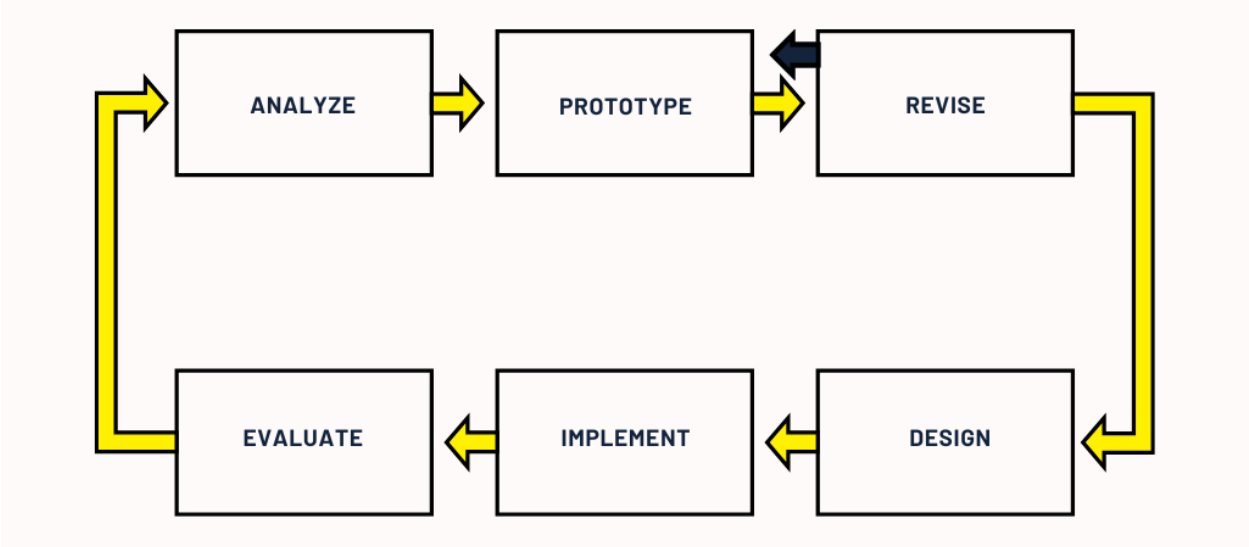
What I learned about project scope

Course design at the university level is a large scope undertaking. To be done well it requires time. Looking back on my project, all the way back to my initial proposal, I did not grasp the

scope of what I was proposing to do. This was a weakness in my analysis, but it yielded valuable insight.

There are many reasons why designers create and utilize design models such as ADDIE, but one of the reasons is that having a process model helps manage undertakings that feel overwhelming. Early in my project I created a design model that worked for me. As simple as it may seem, I credit its uncomplicated touchstones with keeping me on track (see Figure 5.1). I'm not suggesting that other designers adopt my model. I am advocating for finding a model that helps anchor your process. Something that will bring you back to an actionable next step when you feel lost because there will be times when you feel lost.

Figure 5.1 Design Process Model



What I learned about online course design

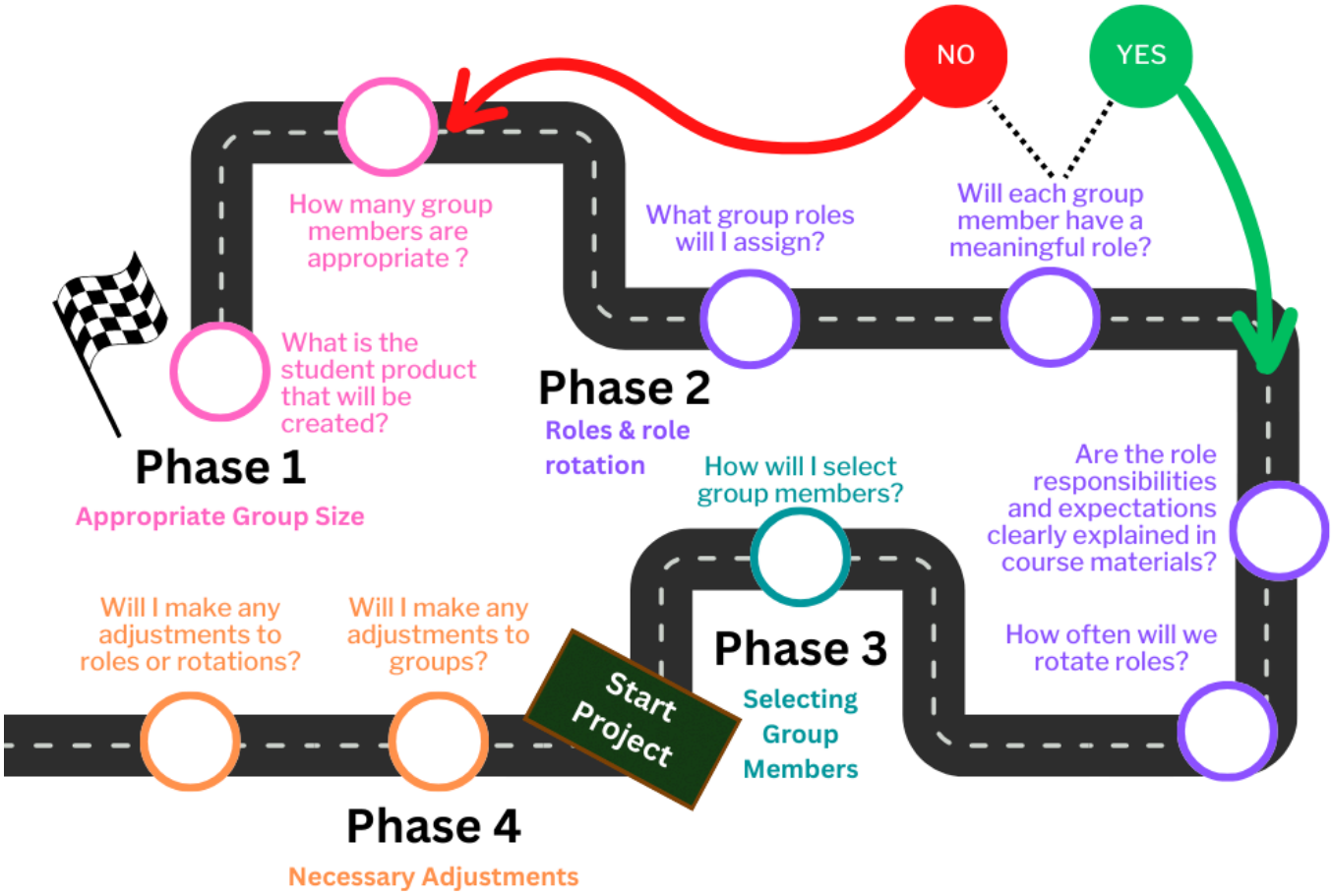
- It takes a team. The partnership between designers and content experts is essential: pedagogy and accessibility in symbiosis. A successful partnership leads to the best learner experience. Collaboration amongst content experts and designers is ideal. Instructional designers can facilitate this by being prepared in each phase of their design to present information and solicit collaborative feedback. The groundwork for this can be laid in the analysis phase of the design, thoughtful work at this stage builds a relationship of trust with stakeholders.

- Online courses are excellent places for PBL. We have the ability to create intentional project groupings. We have the ability to facilitate real-time group discussion and teamwork. Instructors have the ability to move between student groups and provide guidance. Online spaces give the affordance of both synchronous and asynchronous collaboration. The affordances of online tools enhance the ability of students to work both collaboratively and independently. Asynchronous video works well as a trigger for strategy based PBL.

- Student groupings should be intentional more often than random. Intentional student groupings hold great potential for creating the types of social connections that online

courses have been criticized for lacking. Group design is a part of online course design. The graphic in Figure 5.2 outlines guiding questions that can assist designers and practitioners to create these types of groups.

Figure 5.2 Guiding Questions for the Four Phases of Group Design



What I learned about thinking like a designer

- You can create more than you think with very basic equipment and resources. My instructional videos may not win any awards for filmography, but they were effective. Sometimes good instructional materials have a lot of bells and whistles. A lot of the time they don't, and they are still effective in helping learners reach their learning goals.
- Other people will see you struggle and perhaps fail. Stop fearing it. The process of design is a process of iterations, drafts and prototypes. Most of them will end up in the bin. Success comes when you stop being afraid to let people that you respect see you fighting the necessary battle.
- Be curious. Cultivate your imaginative exploration. Who knows what you might learn. Who knows what you might invent. Have fun in the process of discovery.

- Seek mentorship. Find people who are really good at what you want to be really good at. Ask for help when you need it. An experience that will always stay with me is when I asked a senior designer at BYU Online for help. I was so worried that I would be putting him out or annoying him by asking for his time when he was, of course, very busy. I *agonized* over how to approach asking him. I put it off for too long. When I finally asked, fully prepared for a rejection, the most wonderful thing happened. He said yes. Not only did he help me with the task I originally asked for assistance with, he gave me compassion and understanding which I desperately needed. He took extra time to correspond with me and give me project feedback. He enlisted another designer to help review my course. He even attended my portfolio defense. I am so very glad that I asked. His help made all the difference. I don't believe that this is a designer trait that is reserved for those beginning their careers. I am convinced that good designers will always seek out mentors and have the courage to ask for guidance. One of the weaknesses of my design process is that it took me too long to ask for help when I needed it.

Conclusion

When I proposed my project in the winter of 2023 I thought I saw my destination clearly. I was sure that I had mapped out the best way to get there. The place I ended up is different from the one I envisioned, and the path to reach it was not what I expected, but I did reach my goal. I designed instruction that is based in sound pedagogy and sound design theory. I helped my learners achieve their learning goals. I created a professional product. I worked well with my clients and provided them with data and products that help them achieve their aims. I earned design knowledge that only comes through experience. I feel proud to have contributed to work that will benefit BYU students now and in the future.

References

Leary, H. (2022). *Course Description* [IP&T 372: Integrating K-12 Educational Technology 2]. https://byu.instructure.com/courses/22276/assignments/syllabus

Sartore, J. (n.d.). *Arctic tern, facts and photos*. National Geographic. Retrieved May 18, 2024, from https://www.nationalgeographic.com/animals/birds/facts/arctic-tern

Appendix A

Below are the learner personas and environmental analysis that fit within the project constraints for this proposal. Learner Personas were created through a process of (1) Student survey data (see Figure 1.1). (2) Student assignment submissions. Primarily the end of semester assignment in which students expressed their philosophy about technology in the classroom and how that philosophy had developed over the course of the semester. (3) Personal interactions with students as a TA and later an instructor in the course. These interactions included two way communications in the comment section of course assignments in Canvas, emails back and forth with students, office hours Zoom meetings with students, and in class small group conversations with students via Zoom breakout rooms. Some learner personas are based on a compilation of students with similar backgrounds, traits and goals. Some are based on individual students with whom I had the most extensive and personal interactions. Personas contain quotes from student surveys, emails and assignment comments.

Figure A.1 Learner Personas

""I feel extremely comfortable with technology. I love to use it in my teaching as well as learning. I may not be someone that is 100% all tech in every aspect of my life (I'm a FACS major after all...it's a lot of hands on learning) but I think it is very effective when used appropriately."

Brooke

Age: 22
Major: Secondary Ed.
Focus: Physical Ed
Year: Junior

DESCRIPTION

Brooke is pursuing her FACS degree but also pursuing a job in sales. She hopes to finish her degree in the next couple years while working and starting a family.

PERSONAL CHARACTERISTICS

- Outgoing
- Adventerous
- Determined

HOBBIES AND INTERESTS

- Interior design
- Spending time with new husband
- Exercising
- Sewing

HOPES FOR IP&T 372

"I'm not really sure what to get from this class. After taking the Educating students with disabilities class, I felt like I had my eyes opened a lot more to how technology can be more than just a method of better getting a message across, it can actually be the difference between a child with disabilities understanding a lesson and not. So I guess I mostly hope to be up to date with what teachers are using now. I feel like there is so much out there that I don't know"

GOALS

- Balance work and school
- Finish Degree
- Find a job
- Start a family

CHALLENGES

- Only taking this one class this semester and feeling like it is hard to focus time on completing the work

NEEDS

- Connection between class and personal goals.

COMFORT LEVEL WITH TECHNOLOGY

Self score 5/5 - very comfortable

""Technology is a tempting for some teachers to replace instruction with certain elements and this is something I tend to disagree with unless it engages the students in their own learning process."

Mike

Age: 29
Major: Secondary Ed.
Focus: History
Year:

DESCRIPTION

Mike is a Social Studies teaching major and a French Language teaching minor he is excited to get into a classroom Mike is a little older than many of his classmates and feels further removed from the high school experience

PERSONAL CHARACTERISTICS

- Enthusiastic
- Questioning
- Can take offense at critical feedback.

HOBBIES AND INTERESTS

- History
- Spending time with his wife and two children
- Movies

HOPES FOR IP&T 372

"Mostly, I hope to become more familiar with educational technologies available to teachers to give myself a more rounded knowledge of what is out there. By knowing what is available, I can then select the tools that I feel would suit my classroom and students best.

GOALS

- Become more comfortable with different ed tech options

CHALLENGES

- Is busy balancing home, school and work.
- Sometimes becomes defensive when given corrections on work

NEEDS

- Opportunities to participate frequently in giving and receiving critical feedback.

COMFORT LEVEL WITH TECHNOLOGY

Self score 4/5 - comfortable

""Technology is a helpful tool to enhance our lives but can never replace human interaction. I use my phone to communicate with friends, family, and work, I use my laptop for entertainment and school,...Video games, as another example, have always been a point of bonding between me and my brother"

Courtney

Age: 21
Major: Secondary Ed.
Focus: Social Sciences
Year: Junior

DESCRIPTION

Courtney is interested in working with junior high students, she would particularly like to work at an alternative school. Part of that is because the class sizes will be smaller. She enjoys getting to know people and is good at remembering names.

PERSONAL CHARACTERISTICS

- Empathetic
- Self-Doubting
- Introverted

HOBBIES AND INTERESTS

- Video Games
- Movies
- Graphic Design

HOPES FOR IP&T 372

"Above all else, I want to learn educational tools from a teacher's perspective. Perhaps more particularly, I would like to practice collecting and interpreting data into something that I can use to better my future classroom.

GOALS

- Ask for help when needed
- Learn tech from teacher perspective

CHALLENGES

- "I have a weird fear of asking for help. It's something I'm striving to overcome"
- Anxiety/ tendency to become overwhelmed and unable to meet deadlines

NEEDS

- Opportunities to communicate with teacher and TAs in low pressure situations.
- Perhaps some check-in messages throughout the semester if zeros start to pile up.

COMFORT LEVEL WITH TECHNOLOGY

Self score 4/5 - comfortable

""I use technology on a daily basis. I use my phone, tv, and computer. I usually only use technology in education in regards to completing homework assignments and online lectures.

Abby

Age: 21
Major: Secondary Ed.
Focus: Phys Education
Year:

DESCRIPTION

Abby is competent with daily technology use but does not feel driven to incorporate a lot of tech into her teaching practice. In fact she thins it would be better for kids to have less tech exposure in general.

PERSONAL CHARACTERISTICS

- Active
- Hard working
- Stubborn

HOBBIES AND INTERESTS

- Sports
- Travel
- Nutrition

HOPES FOR IP&T 372

"I hope to gain the skills to integrate technology into a physical education class. I am unsure how that would work and if that would even be beneficial."

GOALS

- Not sure what her goals are for this class. Skeptical about it's worth to her teaching

CHALLENGES

- Preconceptions about technology in the classroom and in general.
- Limited familiarity with Ed tech from the teacher's end.

NEEDS

- Opportunities to use technology to solve issues that are relevant to her.
- See the connection between ed tech and her personal teaching goals.

COMFORT LEVEL WITH TECHNOLOGY

Self score 2/5 - not comfortable

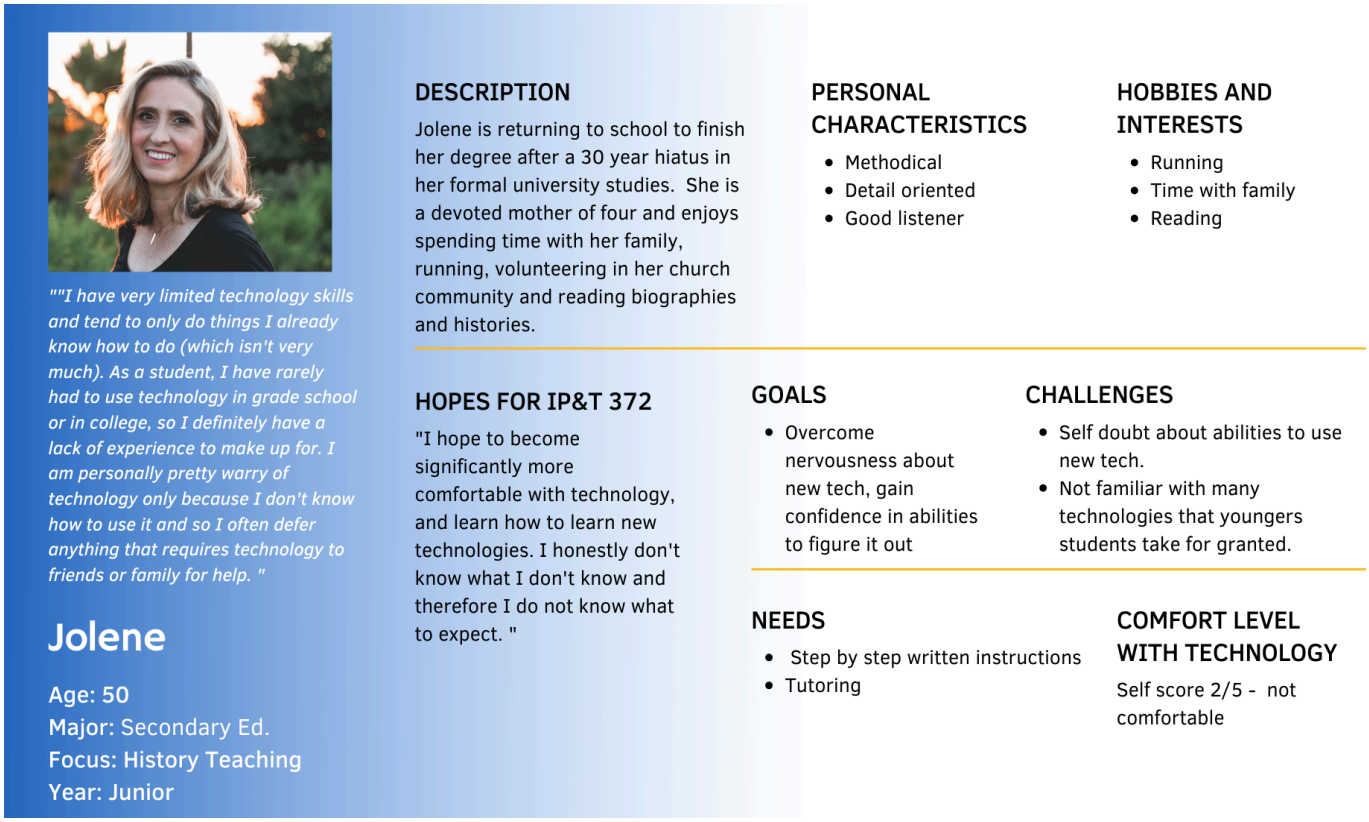


Figure A.2 Environmental Analysis

The Environmental Analysis is based on all of the interactions that contributed to the creation of learner personals, with the addition of participation in all online synchronous and asynchronous class meetings, navigating the course in Canvas as part of my responsibilities as a TA and instructor of the course, meeting weekly with the steward faculty member responsible for the course sections, and with other TAs to discuss the course in terms of design, implementation, and creating course materials as part of my responsibilities as a TA.

Environment and Needs Analysis

Major stakeholders	Learning need	Evidence they have for the need/gap between the learning need and current abilities
Client	Needs to be presented with the information that will come from my research	My evidence for these learning needs is the client's request for this information. The client has asked me to research specific areas, including student survey data, badge requirements within the course,and present her with information to inform her understanding about areas of strength and areas where there is room for growth within the course. The client has also asked me to present her with possible strategies and solutions based on my research and learning in the areas of online learning, problem-based learning and learning design.
Students	How to effectively integrate educational technology in a secondary ed classroom.	They have not yet been full time teachers in a K-12 environment. They are starting their student teaching
Students	See the value of the course	Based on survey data there are about 26% of students who do not have a solid understanding of the purpose of the course or who feel skeptical about its value to them
Students	Increased comfort with educational technology	survey data
Students	Increased exposure to ed tech	survey data
Students	Understanding of how to use technological tools to be more effective in teacher tasks such as gathering data, creating lesson plans etc...	Survey data
Students	How to improve student learning through ed tech	survey data
Students	Best practices for incorporating tech within specific content areas	Survey data

Understanding Student Needs

What in the environment could be causing the problem(s)?	**Have learners been given all the information they need to be successful?** • Students have been given sufficient information to be successful in the course syllabus and in the course materials and lectures.	**Have learners been given all the tools they need to be successful?** • Students should have access to all of the tools that they need to be successful. If they do not have them in their homes they should have access to them on BYU campus. • It is possible that if a student did not have access to campus they might be missing some tools that they need.	**Have learners been given good incentives to perform well?** • Learners have their grade as an incentive to perform well •Students have their success as a future teacher to motivate them - I believe this is an area for growth within the course design. This area of motivation could be increased and capitalized on more effectively
What about the learners could be causing the problems?	**Do learners have the personal knowledge to succeed?** •No. Students do not yet have all of the knowledge they need.	**Do learners have the physical/mental/emotional capacities to succeed?** • This is difficult to gauge. It may vary from individual to individual and each semester will be a new group of individuals. Some students struggle with the mental/emotional capacities	**Are learners sufficiently motivated to succeed?** • Some learners are sufficiently motivated to succeed •Some learners are not sufficiently motivated to succeed - here is an area for improvement.

Constraints

Type	Constraining factor	Effect
Environmental	Online classroom	Some students struggle with accountability in this environment. It requires different methods for creating classroom communities - a lot of pre planning is necessary.
Clients/ stakeholders	Client is teaching other courses, working on research and mentoring graduate students - she is beyond busy	We need to be careful to maximize the time she can dedicate to meeting. I need to take tasks off her hands that are not necessary for her to do in terms of the redesign and the background research.
Content	This is a one credit course	We need to keep the workload within the 3 hours a week constraint.
Legal/regulatory	Student Accessibility	All learning design must be compliant.
Time	Needs to be ready for student use by the beginning of August	Carefully monitor progress against timetables.
Distance	I am in NM my client is in UT	Focus on effective communication

Appendix B

Below Is the rubric evaluation of my redesigned unit given by expert designers at BYU Online. The color in the “Prototype Status” column is indicative of whether or not revision is needed. Green means that the element is meeting the BYU Online criteria. Yellow means that the designer had a question or gave a suggestion. There may not be a need to revise, but it is something to look at. Red indicates an area that needs attention and revision. In the far right column I have placed my notes indicating whether or not an item falls into the scope of my project, whether or not it has been addressed in the design, and in some cases where it was discussed with my client for attention in the ongoing redesign of the IP&T 300 level courses. See “Prototype Designer Response/Notes” section for progress updates on each item. This rubric was extremely useful in reporting back to my client and in making important revisions to the course after piloting

Design Readiness Scorecard

Select rows 2 & 8, then right click and "Unhide" to see instructions.

			Review Stage	Prototype	
			Date		
			Modules	[1 - 3]	
Metric	Criteria	Potential Resources	Prototype Status	Prototype Reviewer Notes	Prototype Designer Response/Notes
1. Appropriate learning outcomes are used.					
1.05*	The course outcomes listed in the syllabus align with what is listed in the academic catalog.	BYU Learning Outcomes	Needs Attention	The course syllabus lists a single, broad learning outcome. The course catalog includes seven outcomes. While most of the catalog outcomes are, or at least could be, subsumed in the single syllabus outcomes, some (e.g., legal issues) are not. Overall, I feel like the catalog outcomes would serve as a better guide/basis for course design.	**OUTSIDE OF PROJECT SCOPE**
1.09	Course outcomes are effectively stated according to industry best practices.		Needs Attention	The syllabus outcome is fairly multi-barreled (e.g., design, develop, and evaluate). It does, however, include only observable language, so that's good. I do feel like the catalog outcomes are effectively stated and better keep the goals discrete.	**OUTSIDE OF PROJECT SCOPE**
1.1	Lesson/module outcomes align with course learning outcomes and are effectively stated according to industry best practices.		Needs Attention	Module 1 learning outcomes start out with "Learn" and "Understand." How will students show that they have learned, or understood? Ditto for the first outcome in Unit 2.	**ADDRESSED**
3. Activities and materials promote learning and engagement.					
3.03*	The course helps students meet the 4 Aims of a BYU Education. - Spiritually Strengthening, Intellectually Enlarging, Character Building, Lifelong Learning and Service	BYU Aims	Verified	Regular use of gospel-focused resources that tie to course content. Good job!	
3.04	The course provides active learning, could be experiential (real or simulated), content-based interactions, projects, collaborations.		Verified	Good explanation of the value of badges and competencies! I like the jigsaw reading (1.5). You may not need this for accoutability, but you could consider whether filling out your section should earn a few points.	
3.07	The course uses a variety of learning activities to promote learning.	EOC Surveys	Verified	Good little exercises such as "Computational What?" keep content pages from just being reading and watching.	
3.09	The course applies formative feedback (such as peer and self-assessment) as a tool for learning and teaching, where appropriate.		Verified	Good feedback messages on quizzes!	
3.11	If included, class discussion or journal prompts are open-ended or complex and require deep thinking to build understanding.		Verified		
3.13*	Courses are designed so students progress together throughout the semester as a cohort.		Verified	This course uses availability dates. The blended format also helps with this.	
3.14	Large blocks of information are divided into manageable sections.		Verified	Yes! Videos and text segments are of easily manageable lengths.	

3.15	The student experience is supported to empower learners to meet lesson/module and course learning outcomes (e.g., through scaffolding, defining vocabulary, activating prior knowledge, building learner schema, emphasizing critical features, providing graduated levels of support, providing multiple modes of representation).		Verified		
3.16	Extraneous or distracting information is kept to a minimum and/or clearly marked as decorative, a resource, or supplementary.		Review Suggested	Good explanation in Week 1 about linked (supplemental) vs. embedded (required) content. Occasionally, though, it can be hard to tell when something is "otherwise indicated" (e.g., "badge tutorial guide" on 2.1). An icon or some way of highlighting required linked content may be useful. The supplementary nature of the Online Learning Resources course (from Start Here in Week 1) was not entirely clear. I'd suggest putting "Optional Review" not only in the page title, but in the header of the page on items like PICRAT. This will back the optional nature more noticable to students who use the prev/next buttons.	**OUTSIDE OF PROJECT SCOPE**
3.17	Students have the opportunity to participate in meaningful interactions with the instructor and other students. These interactions are embedded into the course on a predictable and scheduled basis (usually weekly), and are designed to build a sense of community, foster collaboration, support open communication, and establish trust.	EOC Surveys	Verified	It seems the class meets in person regularly, in addition to the discussions, jigsaw activity, etc.	
4. Students can easily engage					
4.02	The course demand on student time is appropriate.	Pilot Self-Reported Time	Review Suggested	My gut is that this is appropriate. However, without many time estimates, it is hard to be sure. I recommend looking at this again after time estimates are complete.	**ADDRESSED**
4.03	The student load is evenly distributed throughout the course.	Pilot Self-Reported Time	Review Suggested	As above	
4.04	The organization of course content and activities is simple and clear so that learners can easily find and complete various course components.	EOC Surveys	Review Suggested	The module organization, which groups all content together and all assignments together across multiple weeks, is odd to me. Students are likely to use the prev/next buttons to navigate, and this structure makes that not work so well. They are told to use the home page for navigation, but there are two problems: 1) some students will miss that, or assume (reasonably so) that prev/next buttons will follow the home page, and 2) not all items in the module are linked from the home page. For example, in Unit 1 neither the readings overview nor the assignments overview pages are. UPDATE: I later figured out that they are linked, but this wasn't apparent at first; it just looked like column headers. To further encourage homepage-based navigation, I suggest disabling the navigation links for Discussions, Assignments, Quizzes, etc.	**Disscussed with client - client agrees and this will be addressed in redesgned courses.**

4.05	Assignment instructions and expectations are sufficiently clear for students to be successful.	EOC Surveys	Review Suggested	Mostly this is good. However, there are a couple of odd moments, such as: 1) "Answer the questions below" on the Getting to Know You quiz, when all that is below is a Take the Quiz button. (NOTE: The Likert scale question on this quiz won't work the way you want. You'll have to override grades and may get some students confused until you do.) 2) The Unit Check-Ins have no instructions or description at all, just the Take the Quiz button.	**ADDRESSED**
4.07	Students can access course materials.		Needs Attention	The only problem I saw is that the submit evidence page for the badge in Unit 2 doesn't work. It appears the link is broken. One accessibility sidenote: Google doc links in the course are generally not descriptive, but rather use the URL as the link text. For students with screen readers, this is bad feng shui.	**ADDRESSED**
4.08	Minimum technology requirements for the course are clearly stated, and information on how to obtain the technologies is provided.		Verified	This information is clearly stated in the syllabus.	
4.13	Reasonable and generous time estimates (calculated based on research, experience, and data collected during the pilot semester) are included for student reference.		Needs Attention	Some things have time estimates, but most do not. Those that do are usually things with videos. And, the time estimates seem based only on the videos (e.g., PICRAT), so they are not particularly accurate. Also, they were only given on individual pages/items. It would be good to have an overview page for each week, showing at a glance the time estimates for everything students will do that week.	**ADDRESSED**
5. The course serves the target audience.					
5.01*	The cost of course materials is appropriate for the target audience of the course.		Verified	As best as I can tell, everything is free.	
5.02	Language, symbols, analogies, and images in the course are understandable by and representative of diverse learners.		Verified		
5.05	The course schedule and use of synchronous work is appropriately flexible for the target audience to engage.		Verified		
Template/Style Guide Items for Early Review					
*	The course home page is the modules view and includes the course home header with the course title, banner image, and top navigation links as specified in the BYU Online Style Guide.	BYUO Style Guide	Needs Attention		**OUTSIDE OF PROJECT SCOPE**
*	The course uses LTI tools appropriately per the BYU Online Style Guide.	BYUO Style Guide	Verified		**OUTSIDE OF PROJECT SCOPE**
*	Every module starts with a course overview page with learning outcomes, a list of what to do that week (with time estimates) and other scaffolding information.		Needs Attention		**OUTSIDE OF PROJECT SCOPE**
*	Module title, item titles, etc. do NOT include highly variable information (e.g., due dates). The module may include sub-headers with days (but not specific dates).		Verified		
*	Module Requirements (e.g., "View, Mark Done, Submit") are included for each item in the module structure.		Verified		
*	All items in module structure include a progress bar at the bottom or top of the page.		Review Suggested	Each item has a progress bar, but with the way the modules are currently organized, it is relatively meaningless because it doesn' correspond to everything the student needs to do in a particular period of time.	**Disscussed with client - client agrees and this will be addressed in redesgned courses.**

*	Assignment instructions include rationale, succinct instructions, and a rubric (when human-graded).		Review Suggested	Discussion rubrics are PDFs. Consider uing native Canvas rubrics.	**Disscussed with client - client agrees and this will be addressed in redesgned courses.**
*	Assignments with multiple points of contact (e.g., peer reviews, discussion replies, reading benchmark) should include a reminder for subsequent items (e.g., a reminder to reply to peers or complete the peer review).		Review Suggested	The due date of discussions is the date when replies to peers are due. I recommend using a calendar item to indicate when original posts are due or, alternatively, setting the due date to the date for original posts and using a calendar item, a page, or a no-submission ungraded assignment to remind students of when replies are due.	**Disscussed with client - client agrees and this will be addressed in redesgned courses.**
*	File names are descriptive unless doing so would compromise the validity of an assessment (e.g., include Lesson # and descriptive title: "L1_protractor.jpg").		Exempt		
*	Links to other items within the course should be kept to a minimum (i.e., this does not impact links to external content). (*Reviewer Note: Some standard exceptions to this rule are listed in the BYU Online Style Guide* .)		Verified		