STEM Online Kit

Design Process Document

1. Introduction

This design process document explains the methodology that I adopted in planning and designing a learner activity page within a comprehensive online STEM educational kit. Click to view the full educational kit and navigate to the **'challenge tab'** to view the learner activity page

2. Background

The overall kit educates learners about the field of Biological Anthropology, and how it can lead to pathways in STEM careers, through the lens of a current scientist in that field. However, the learner activity page (which is the challenge tab) within the kit engages learners to experience the type of work and problems that the scientists solve in their job, by utilizing biological anthropology, scientific tools, and methods.

3. Target Audience and Learning Environment

The kit is primarily designed for high school students learning in a classroom environment and having access to computers, printers, and basic stationery. Since the educational kits are available as a free public resource, they can be used by a diverse range of young adult learners as well.

The kit serves as an introduction to learners who have limited/no exposure to the field of biological anthropology and inspires them to explore the area.

Learners who might already be familiar with or interested in the subjects related to this field will gain a new perspective on how biological anthropologists utilize scientific tools and technologies in the industry to solve societal problems.

4. Learning Objectives

- Learners will experience how biological anthropology can be braided with chemical and biological tools to address societal questions that intersect health, environment, and culture.
- Learners will explore the field of biological anthropology and see how it integrates with STEM tools, methods, and technologies
- Learners will be able to relate their interests in subjects like biology, chemistry, environment, culture, and humanities to possible STEM careers in the future

5. Design Process and Methodology

The design process for the 'learner activity page' involved me executing the following steps

Analysis - Background study about the field of biological anthropology and its application to real-world, learned about the work of the scientist (biological anthropologist and analytical chemist) from company websites, and blogs, read about the tools that the scientist uses in his job, made notes from the scientist interviews about the type of problems solved, and personal insights.

Drafted the learning objective and activity concept (storyline) considering the learners' age, context, accessibility, level of interactivity, available time and budget, and overarching goal. Presented the activity concept in the kick-off meeting and received inputs from the team.

Design - Adopted the Design Challenge model to create a problem-based scenario for learners to investigate, collaborate and create solutions. The problem-based scenario is a simulated situation, influenced by the type of challenge that the scientist solve in their real job.

Drafted the activity outline and provided inputs for design (graphic, interactivity) at this stage. Presented the design draft in the review meeting to elicit feedback from internal teams.

Development - Used the Rapid Instructional Design model to lay out the activity into separate sections and created a script for each section. Developed the instruction flow such that it facilitates learners to gain the background knowledge to investigate the problem, discuss questions, choose tools, collaborate, and reflect on their solutions.

Added sections to provide an opportunity for learners to apply their gained knowledge into practice to motivate learner engagement and meet the desired learning outcome. Presented the developed draft in the second review meeting and addressed feedback. Uploaded the final content in Squarespace.

6. Assessment

Due to the diverse and wide scale of learners using the online kit, there is flexibility for both learners and educators to use the kit according to their own classroom and learning needs. Therefore there is no explicit assessment section in the kit. However, the reflection questions and outcomes that the students create from the activity are used as a formative assessment to validate learning, clarify misconceptions, and most importantly meet the desired learning objectives.