Instructional Design Proposal:
Hazard Communication Standard Training

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Problems in Instructional Design for Computers
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Abstract:

This instructional design proposal outlines the creation of a comprehensive Hazard Communication Standard Training course, designed for General Industry employees in corporate settings. This course's main objective is to equip employees with essential knowledge and skills to ensure a safe and healthy workplace, in accordance with Occupational Safety and Health Administration (OSHA) regulations.

The course content centers on OSHA's definition of hazards as potential sources of harm, injury, or adverse health effects. It follows OSHA Hazard Communication Standards and aligns with the United Nations Globally Harmonized System of Classification and Labelling of Chemicals (GHS). The core aim is to provide a foundational understanding of workplace hazards related to chemicals present in the work environment. This encompasses awareness of potential exposures in normal working conditions and foreseeable emergent situations, along with the safe and appropriate handling methods.

It is important to note that this General Industry training is distinct from specialized industry training, such as Maritime, Construction, Agriculture, and Federal Employee Programs, as stipulated in the Training Requirements in OSHA Standards 2015. This course will be accessible online, facilitating ease of access for employees across diverse locations while adhering to the imperative goal of promoting workplace safety and compliance with regulatory standards.

Need for Project:

The occupational Safety and Health Administration (OSHA) is a division of the U.S. Department of Labor. This federal agency requires that employers provide their employees with a safe and healthy workplace and the training to manage dangerous conditions. This CBI training is necessary to comply with the training requirements in OSHA standards for General Industry workers Title 29, Code of Federal Regulations Part 1910, Subpart Z: Toxic and Hazardous Substances, Standard Number 1910.1200, Hazard Communication.

Due to the diverse locations of employers, the potential number of employees that could be impacted, and the need for this training to be completed annually, Computer-based training would be ideal because employees would have the opportunity to learn the content in flexible sessions that encourage retention by allowing learners to revisit material if necessary. An asynchronous CBI approach for corporate training provides instruction at convenient times for both employee and employer. Additionally, Employers will be able to use the post-training data to verify compliance with OSHA’s requirements.

There are several teaching and learning challenges that exist when addressing OSHA’s requirement of safety training with employees. Because the training is for all employees, the range of learner’s abilities and background knowledge is broad. Attitudes and beliefs related to safety vary among individuals from diverse cultural, racial, and ethnic backgrounds, each with

unique perspective on safety. Motivation is another challenge since the content is required learning rather than interest driven. Communication styles and language proficiency levels vary, requiring inclusive course content accessible to all.

Target Audience:

This computer-based training is designed to accommodate the diverse needs and backgrounds of our target audience. The target audience for this course consists of employees of multiple experience levels (entry to senior roles) working in professions that come in contact with hazardous chemicals or materials. Regardless of work experience, the content featured in the training will be relevant and beneficial to all. Although this course is designed for the corporate setting, it can also be used as a base to train employees working in construction, manufacturing plants, laboratories, or healthcare facilities in conjunction with any additional training requirements outlined by OSHA for these specialized industries.

User Personas:

Cheyanne: Cheyanne is 23 years old and recently finished earning her bachelor's degree. As a new hire in the production department of a manufacturing company, she has never participated in any OSHA training sessions before. As a recent college graduate, she is accustomed to learning independently and is comfortable with receiving instruction through her laptop or a smartphone device. However, regarding the theme of this training, Cheyanne is new to this sort of information and wants to feel confident with her abilities to understand and apply her learning properly. Cheyanne believes she is the most successful when she is given clear instructions and learning objectives. To reach high levels of confidence and satisfaction in her learning, Cheyanne wants to participate in sequential learning that starts with beginner information then progresses to more complex concepts. She also prefers educational content that is interactive and filled with visuals to help hold her attention and apply her learning to her daily tasks.

Omar: Omar is a 47-year-old manager responsible for overseeing safety compliance in multiple departments at his company. He is a more senior employee and has years of experience dealing with the OSHA Hazard Communication Standards. It is his job to make sure that the employees he oversees are fully aware of these standards and participate in the mandatory training sessions. Due to the large number of employees and demanding work schedules, Omar is concerned that the traditional model for training employees on the OSHA standards can be disruptive to the daily responsibilities of the company. Omar prefers to introduce a style of instruction that is easy to access on a variety of electronic devices and features brief yet informative modules that can be started and stopped at any time. For employees like himself who are already accustomed to the OSHA Hazard Communication Standards training sessions, this instructional tool should include recent updates to hazard standards or key information that can easily be communicated and shared between others in the company.

Performance Objectives:

According to the Occupational Health General Industry Training Requirements document, general industry employers must provide information and training on hazardous chemicals in their work area during the initial assignment with a recommendation for annual training thereafter (OSHA 2254).

Our training will meet the requirements outlined by OSHA by ensuring that after completing the course, users will be able to:

- Recognize hazard labels and symbols as outlined by GHS, including:
    - Describing the elements of a GHS label
    - Recognizing GHS hazard pictograms
    - Differentiating what hazard each pictogram represents:
    - Categorizing each pictogram by one of the GHS hazard categories
- Identify Safety Data Sheets (SDS) required to be posted for all potential chemical hazards present in their workplace, including:
    - Defining the purpose of an SDS
    - Locating the 16 GHS-mandated sections of every SDS
    - Discovering the specific information contained in each of the 16 section headings.
- Recall methods and observations to use in detecting the presence of or release of a hazardous chemical in their work area, including:
    - Outlining visual appearance
    - Recognizing odors of hazardous chemicals
- Take measures to protect themselves from hazards, including:
    - Summarizing appropriate work practices
    - Explaining emergency procedures
    - Recalling personal protective equipment (PPE) to be used
- Locate specific hazard information for their employer, including:
    - Resources
    - Contacts

CBI Content:

- Introduction of the topic and a link to the specific OSHA standard
- Explain the purpose of the training:
    - In compliance with OSHA Hazard Communication Standards
    - Right and Responsibility to be aware of and understand:
        - Hazards
        - Safe work procedures
- State Clear overall objectives. Learners should be able to
    - Recognize hazard labels and symbols.
    - Identify Safety Data Sheets (SDS)

    - Summarize methods and observations to use to detect the presence of or release of a hazardous chemical in their work area.
    - Take measures to protect themselves from hazards.
    - Locate specific hazard information for their employer.
- Outline the basic structure of the course:
    - Amount of time form completion
    - 10 question quiz at the end requiring 80% to pass and complete the course.
    - Breakdown of sections
        - **GHS**
        - **SDS**
        - **Detecting hazardous chemicals**
        - **Protecting themselves**
        - **Locating Information**
- **GHS:** Recognize hazard labels and symbols as outline by GHS, including:
    - Describing the elements of a GHS label
    - Recognizing GHS hazard pictograms
    - Differentiating what hazard each pictogram represents.
    - Categorizing each pictogram by one of the GHS hazard categories
- **SDS**: Identify Safety Data Sheets (SDS) required to be posted for all potential chemical hazards present in their workplace, including:
    - Defining the purpose of an SDS
    - Locating the 16 GHS-mandated sections of every SDS
    - Discovering the specific information contained in each of the 16 section headings.
- **Detecting hazardous chemicals**: Summarize methods and observations to use to detect the presence of or release of a hazardous chemical in their work area, including:
    - Outlining visual appearance
    - Recognizing odors of hazardous chemicals
- **Take measures to protect themselves** from hazards, including:
    - Summarizing appropriate work practices
    - Explaining emergency procedures
    - Recalling personal protective equipment (PPE) to be used
- **Locate specific hazard information** for their employer, including:
    - Resources
    - Contacts
- **Knowledge Check**: 80% required to pass and complete the course:
    - 10-15 questions presented in a variety of interactive questions (multiple choice, multiple selection, sorting, matching, etc.) pulled from the information presented throughout the course.
    - Learners would be given the opportunity to attempt the quiz two times to achieve a passing score.
    - After two attempts, learners would be forced back to the beginning of the course to repeat it.

Time Scale for CBI:

- **Initial Training:** Employees will complete the initial Hazard Communication Standard Training when they are hired. This training typically takes 15-20 minutes to complete. It is a one-time requirement for new employees to ensure they have a fundamental understanding of workplace hazards associated with chemicals.

- **Annual Refresher Training:** It is recommended that employees refresh their knowledge of hazard communication annually. This refresher training is essential to keep employees up to date with any changes or updates related to chemical hazards and safety protocols. The duration for this annual refresher training is typically around 15-20 minutes as well.

Instructional Activities and Strategies:

Since this is a federally required training as part of the Occupational Safety and Health Standards (OSHA) for all employees at their initial assignment and recommended to be repeated on an annual basis, the computer-based module is designed to provide for learning to occur at times convenient for both the employee and employer without the need for instructor-led training.

The CBI will be extremely interactive, providing opportunities for users to participate in guided activities within the CBI, such as identifying the Globally Harmonized System (GHS) label elements for chemicals, categorizing, and sorting hazard pictograms, and reviewing an actual SDS to locate and compare the information contained in all mandated section headings. In addition, users can access and download resources outside of the CBI and locate and explore online material safety data sheets for their company.

The federal requirements are to inform and train employees on identifying and protecting themselves from potential workplace hazards. As a result, our training objectives are based on Cognitive Information Processing Theory where the user receives information from the CBI that they can store in their short-term memory to process and connect with other information already in their long-term memory.

Settings and Materials:

Setting

- **Location:** The Hazard Communication Standard Training will be delivered online, making it accessible from anywhere with an internet connection. This means it can be accessed by students from various locations, including their homes, workplaces, or any place with internet access.

- **Delivery Method:** The course will be hosted on the internet, allowing users to access it via web browsers. The completed Hazard Communication Standard Training will be packaged as a SCORM (Sharable Content Object Reference Model) file, ensuring compatibility with various Learning Management Systems (LMS).

Limitations of the Setting

- **Internet Access**: One limitation of an online setting is that it requires a stable internet connection for access. Users in areas with poor or no internet connectivity may face challenges accessing the course.
- **Hardware and Software Compatibility**: Users will need access to computers or mobile devices that are compatible with the course materials. Additionally, they must have web browsers capable of running the content smoothly.

Materials Used by Instructors and Students

- **Computer Materials**: Instructors and users will primarily use computers or mobile devices to access the course content. This will require compatible hardware and software for optimal learning.
- **Non-Computer Materials**: While the primary focus is on digital materials, there may be supplementary non-computer materials, such as printed handouts, safety data sheets (SDS) in physical format, or manipulatives. These non-computer materials can enhance the learning experience and provide hands-on practice where needed.

Course Development Tools

- **Articulate Storyline 360 will be used as the main course development authoring tool.** This software facilitates the creation of interactive, multimedia-rich content, including assessments and branching scenarios.

- **VoiceMaker**: VoiceMaker, an innovative text-to-speech technology, will be used to provide clear and natural-sounding audio narration for the course. This enhances accessibility and ensures that learners can easily grasp the content.

- **Flaticon**: Flaticon, a rich resource for high-quality icons and visuals, will be utilized to enhance the course's visual appeal. These icons will help in conveying complex concepts and information effectively.

Assessment:

Immediately after each course section's completion, users will be presented with between one to three knowledge check assessments to ensure the stated performance objectives for the section were met. Questions will be in various formats such as multiple choice, true/false, multiple responses, matching drag and drop, matching drop-down, and sorting drag and drop, allowing users to check the knowledge they just learned.

Users must score at least 80% on a final assessment to receive course completion credit. The final assessment will consist of 10-15 questions drawn from the bank of questions previously asked during the section knowledge checks. Each question will provide a link allowing users to display the related content in a pop-up window to assist with recall.

The final assessment will not be timed, but users will have two attempts to achieve the 80% score before they are directed to retake the entire course.

Tentative Group Members' responsibilities & implementation:

The background and skills possessed by the members of our group are diverse. We will continue to work as a team approaching the tasks related to this project cooperatively, utilizing the talents of each member to support the development of a quality training product.

Kirsten- Design and programming
Erin- Focus on learning goals, assessment, and planning
Dawn- Creation of course content
Taylor- Research of resources that support mastery of the learning goals.

This project will use Articulate Storyline 360 as the main multimedia authoring tool for course development. VoiceMaker and Flaticon will be used to incorporate engaging audio and visuals that enhance the learner's experience.

References

Occupational Safety and Health Administration U.S. Department of Labor. (2015). Training Requirements in OSHA Standards. Washington DC.

1010.1200 - *hazard communication*. Occupational Safety and Health Administration. (n.d.). https://www.osha.gov/laws-regs/regulations/standardsnumber/1910/1910.1200

6 types of safety hazards in the Workplace (with examples). Indeed Career Guide. (2023, March 10). https://www.indeed.com/career-advice/career-development/safety-hazards

https://osha.gov/sites/default/files/publications/osha2254.pdf