

Evaluation Report for an Asynchronous Articulate Training

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Abstract

The development of a self-paced eLearning module to influence behavior using realistic and relevant tools and activities needs to be carefully designed and skillfully executed. Using grounded design, the instructional designer needs to align Instructional Theories with the appropriate Instructional Design Model. I have developed such a project using the robust Articulate Storyline 360 platform to recreate real-world scenarios, set in various medical situations, to ensure non-medical employees stay safe from bloodborne pathogens. The Instructional Design Model used was Cathy Moore's Action Mapping and the Instructional Theory used was Goal Based Scenarios. Both have an emphasis on real-world engagement. A focus group was arranged to implement and to evaluate this training. The data was collected and analyzed using Ritchie & Spencer's 5 stages of framework analysis. The results of this report serve as the foundation for the training revision recommendations and reflections.

Introduction

In 2018 I was promoted to an instructional designer within my company. I began the process of learning to apply what I was learning in my graduate courses. I was tasked with learning the Articulate 360 suite, with an emphasis on the eLearning authoring tool, Storyline. In the fall of 2020, I was excited at the opportunity to practice my Storyline skills and my instructional design skills by developing a training using two tools I utilize at work, Storyline AND Action Mapping, for a graduate course at the University of Cincinnati. Here is some background on my project. My company employs sign language interpreters, who interpret in medical settings and must be trained in bloodborne pathogens safety before they can begin serving in that capacity. OSHA (Occupational Safety and Health Administration) requires employers to communicate safeguards to workers who may be exposed to blood or other infectious materials (Bloodborne Pathogens-Standards, n.d.). After the AIDS epidemic in the 1980's, the CDC issued guidelines for reducing the risk of exposure of blood and bodily fluids, and OSHA's advisory notice to employers went into effect in 1991 (Jagger et al, 2008). My graduate course required me to choose a topic and design a course using Articulate Storyline and then create an eLearning. I chose Bloodborne pathogens as the topic of my eLearning training, and sign language interpreters as the target learners. I wanted to build an experience in Storyline for sign language interpreters to learn about Bloodborne Pathogens, while also meeting the employer mandate of communicating this information to their employees.

Since this graduate project included Action Mapping by Cathy Moore, which is a way of training to change behaviors (Moore, 2021), applying the Goal Based Scenario (GBS) instructional theory was the perfect match. GBS focuses on developing skills by practicing them in realistic scenarios (Schank, et al, 1993). Combining the instructional design model of Action

Mapping and the Instructional theory of GBS shaped the design and development of this eLearning.

Evaluating trainings is also something we implement in my current place of employment. Our trainings are an iterative process going through internal reviews, Alpha reviews, and Beta reviews, each time making revisions based on user feedback. Although the evaluations of trainings at work are not as rigorous as the data collection of this report, the method I chose to evaluate this training mirrors user insight and their feedback. According to Rabiee, (2004), focus groups are used to gather information about ideas, opinions, and feelings, represent the targeted audience, and focus on a certain topic. To analyze the qualitative data I collected, I chose to use an evaluative objective of appraising the effectiveness of the training, identifying what affects a successful delivery, how might it affect behaviors, and what barriers arose (Ritchie & Spencer, 1994). To do this, I implemented the 5 key stages to qualitative analysis by Jane Ritchie Liz & Spencer. Based on data collected and documented in tables, recommendations for revisions have emerged.

Instructional Design Model and Instructional Theory

The development of this project relied on Cathy Moore's Action Mapping model as the foundation of the design for building the eLearning in Articulate 360 Storyline (see Appendix A). In *IDD&E: Essentials* (2017), Action Mapping is listed as a resource under Instructional Design Models. Instructional Design Central (2021) also lists Action Mapping as an Instructional Design Model stating that this design model creates trainings that are focused on changing what people do, not their knowledge, using action-packed materials and 100% dedication to improving performance. In a SlideShare presentation, Cathy Moore says, "Our job is to help people solve problems in the real world" (2009, slide 92). The training I developed is geared toward real-

world scenarios, focused on behaviors, or what an interpreter should do, in medical environments to stay safe from bloodborne pathogens. The goal of Action Mapping is to create realistic practice activities, instead of simply presenting information or facts (Moore, 2021). Action Mapping starts with (1) a measurable goal, (2) then identifies the behaviors that will be reached through that goal, (3) designs realistic practice activities for each behavior, and (4) finally compiles essential information needed for each activity (Moore, 2021).

Aligning with this real-world Instructional Design Model, is the instructional theory Goal-Based Scenario (GBS). Schank et al (1993), stresses the goal of GBS is to master a set of target skills by practicing within the context of an authentic setting. Furthermore, supporting a learner through realistic simulations with a coach in the background is an optimal design within GBS (Schank et al, 1993). Schank (1993) highlights the importance of avoiding abstractions and instead allowing students to have access to real cases, situations, and stories within real contexts. Action Mapping is the perfect complement to GBS, because according to Franssen, Lowry, and Franssen (2017) action mapping's focus is not on abstractions, or knowledge-based outcomes, rather the focus is on observable and measurable behaviors that one performs on the job. The Bloodborne Pathogens training is designed to engage students in real-world scenarios, and change their behaviors, or improve a targeted set of safety skills.

When developing this eLearning, I was struck by a slideshow presentation by Cathy Moore. In Moore's slideshow (2009), there was mention of a training designed to help restaurant servers safely carry trays without dropping them. Weight distribution was a key factor in safely carrying a big tray of food. The Action Map identified this as a goal and then created an eLearning activity simulating a tray and food items to be placed on the tray. The learner could

drag and drop items onto the tray and depending on the weight distribution, they would get feedback on if their tray tumbled or was safely distributed. This is a real-world type of scenario.

I wanted to create something like the server and the tray scenario in my training. I wanted to simulate medical environments and let the learner discover if they were safe from exposure or were at risk. Similar to the Action Map design, Schank and Cleary (n.d.) say for a designer to create a GBS, they need to follow 6 steps: (1) Identify the target skills, (2) develop a mission that uses the target skills, (3) choose an area of focus, (4) create a story around the mission, (5) design the operations, (6) build the learning environment based on the target skills (See Table 1 below).

Table 1

Six Steps for Creating a GBS Design

Objectives and Design	Steps for Creating a GBS					
	Target Skills	Mission	Focus	Cover Story	Operations	Build Environment
	Objectives					
Row 1	Identifying and avoiding potential BBP hazards	Help Samantha stay safe from BBPs for her interpreting assignment	Hazards in medical rooms (surgical rooms, dental office, labs, etc.)	Samantha needs to prepare for her interpreting assignment. Help her take steps to stay safe	Pre-assignment, during the assignment and post assignment	eLearning developed in Articulate Storyline
	Tasks for the Learner					
Row 2	<ul style="list-style-type: none"> • Define BBPs • Review routes of entry 	<ul style="list-style-type: none"> • Determine proper attire • Identify potential hazards • Action steps when exposed 	Enter a lab, a dental office, and a surgical room and do a scene survey to identify the potential dangers in each	Pick out Samantha's clothes, decide what she should bring, and decide the steps to take when she is exposed	<ul style="list-style-type: none"> • Select shirt, pants, and shoes • Pack a bag to bring (food and necessities) • Spot hazards in all medical rooms • Act when exposed • Check personal belongings 	<ul style="list-style-type: none"> • Clothing scenario • Dental office scenario • Lab scenario • Surgical Center scenario • Surgery scene scenario

With the design and creation of this project, several scenarios, interactions, and activities were created. One activity requires the learner to identify which items are safe to use on the job, and which items could put them at risk. This was a drag and drop activity like the restaurant tray. Some of the items were contact lenses, lip balm, bottled water, and eye makeup. Since eyes and

mouth are routes of entry for bloodborne pathogens, they would receive feedback indicating they might be at risk if they chose those items to bring or use on the job. Another item was a Band-Aid. Since broken skin is a route of entry, the learner would receive positive feedback that they were staying safe from exposure. Another activity that used GBS's theory of mastering skills in the context of a realistic environment was the scene surveys. Doing a scene survey requires a learner to enter a simulated medical room and visually scan the room for potential dangers. One room was a dental office, and the learner needed to identify not only the obvious hazards like the cleaning instruments, but also the waste receptacles and a bowl of apples that was on the counter. Immediate feedback comes up when they find a potential danger. This eLearning is not designed for reading information simply to gain knowledge, rather it is designed to be interactive with real-world scenarios with a goal of staying safe.

Data Analysis and Results

I collected data by recording a focus group conducted using Zoom's digital platform. The focus group consisted of 6 seasoned sign language interpreters, all who have medical interpreting experience, and all but two have taken a Bloodborne Pathogens training. While most took the training on computers, it was discovered during the focus group that two of the participants had taken the training on a mobile device, which created visual challenges (see Table 2 below). The focus group session generated 17 pages of transcripts and preliminary notes taken. I chose to utilize a framework specifically designed to sort, organize, and interpret qualitative data. Following steps, the framework categorizes information into manageable units of data which eventually leads to an interpretation. According to Srivastava & Thomson (2009) this 5-step procedure that Jane Ritchie Liz & Spencer developed, specifically to handle the large volumes of qualitative data like this. Rabiee (2004) notes that using these 5 interconnected stages of the

analysis process allows for themes to develop from the conversations among the participants, as well from the research questions. Ritchie and Spencer (1994) outline these 5 stages: familiarity with the data, identifying the thematic framework, indexing, charting, and interpretation. They go on to say that this process relies on the analyst to conceptually determine meaning, salience, and connections to the data (Ritchie & Spencer, 1994). In this project, this “Framework analysis” will be applied to analyze the data I have collected from my focus group. The objective of this qualitative method is evaluative, assessing the effectiveness of the Storyline eLearning training.

Table 2***Participant Background Information***

Background Information	Participant Identification					
	CO	DP	NM	MS	TE	MM
	Years of Interpreting Experience					
Row 1	26	13	26	18	24	16
	Medical Interpreting Experience					
Row 2	Yes	Yes	Yes	Yes	Yes	Yes
	Taken a Bloodborne Pathogens Training in the Past					
Row 3	Yes	Yes	Yes	Yes	No	No
	Testing Environment					
Row 4	Mobile Device	Computer	Mobile Device	Computer	Computer	Computer

Become familiar with the data

This first step requires immersion into the data by reading the transcripts, watching the video recording several times, reviewing observational notes, getting a generalized sense of the whole interaction, and noticing major themes as they emerge (Rabiee, 2004). Seventeen (17) pages of transcripts were created and reviewed, the recording of the one-hour Zoom meeting was viewed twice from beginning to end, and notes were taken to determine a general feel of the

meeting, as well as to determine major themes. The first generalization I came up with after the transcript review and the video recording review, was that the pre and post-test was a major topic. I started off with a keyword search of the transcripts to find what was discussed the most. I decided to search for terms related to testing and training. The words which were mentioned the most were words like “test”, “answer”, “click”, “like”, “question”, and “training”. The word that was mentioned the most was the “test”. See Table 3 below:

Table 3***Emerging Themes***

Number of mentions	Word mentioned					
	“Test”	“Answer”	“Click”	“Like”	“Question”	“Training”
	Frequency					
Row 1	38	36	32	29	27	21

Note. Numbers found doing a word search through the transcripts of the focus group.

Identify the thematic framework

The second step in this analysis process is to begin to develop categories and using descriptive statements to start an analysis (Rabiee, 2004). Ritchie and Spencer (1994) say this step has the analyst returning to key issues, concepts, and themes that seem to be important to each participant. Since one of the dominant words mentioned above was test, I decided to return to this concept. The pre and post-tests had 10 questions. I searched for the questions mentioned the most throughout the interaction and created a table to place data according to the test question and number. I made a column for each test question. I also included a “general” column for comments not related to a particular test question. I used descriptive statements when categorizing this data. I discovered the group continued to revisit test questions number 3, 6, and 7. A few examples from the “general” column noted that participants stated they did not do as well on the pretest as on post-test, struggle with written tests in general, and would have liked an

“All of the above” option. For questions 3, 6, and 7 the comments were related to discrepancies in the information presented in the training and the multiple-choice options that were considered “correct”. For example, a descriptive comment noted for question 3 was there was an emphasis on checking personal belongings in the training, but the options for personal belongings for this answer were considered incorrect. The interpretation step will narrow this to more specific ideas for solutions.

“Training” was another dominate word mentioned from the first part of this analysis. The group discussed the design and delivery aspects related to usability in their conversations. Another table was created to sort this data with five columns: participant, design/delivery positive, design/delivery constructive, design/delivery general, and content. The table highlights the framework of this theme. Often, one participant would bring up an area of confusion or struggle, and another participant would chime in with a similar sentiment or experience. Some examples of positive comments were the different voices for each character of the training, the variety of interactions available, the ability to skip ahead, and the scenarios presented. Some of the constructive feedback was not being able to identify a few pictures in the training, prefers a human voice to a robot voice, not being able to get out of an interaction because the “X” on the screen was overlooked, and not being able to click on words that were supposed to be clickable. The general column had remarks about, the next button always being displayed on the screen, and the search interaction has a finger icon that shows up when you find a hazard. Finally, the content column had comments regarding, the various interactions allowed for a more complete picture of risks, comprehensive understanding of information presented in the operating room, and the feedback given about the shoes one would wear. Further analysis through the framework steps will narrow down these concepts.

Indexing & Charting

The indexing and charting steps require the analyst to sift through data, sort quotes, make comparisons, and group similar quotes together (Rabiee, 2004). These two steps happened simultaneously during my analysis. I began to cut and paste quotes and move them around in different categories. It was during this step, that the data starts to evolve into new categories. A more detailed look at the quotes and comparing them revealed that some of the quotes originally thought to be about design and delivery, were really related to functionality and the coding taking place in the background of Storyline. For example, MM said they were confused about where to click on a slide. This was originally coded as design and delivery, but analyzing this further, and grouping it with similar comments, it became clear that this is a coding issue and not a delivery issue. MM was supposed to click on an individual letter according to the directions on the slide. MM clicked on the word next to the letter and got stuck. This can be fixed by making the clickable zone larger. Similarly, some data originally coded as design and delivery was really about accessibility. For example, CO points out that he couldn't see the pictures well under the category "Design/Delivery Constructive" feedback. Upon further analysis of the transcript and actual quote, it becomes an accessibility issue since the picture was not labeled with alternative text. The design of the picture doesn't necessarily have to change but making it accessible is essential. By the end of this step in the framework analysis, four categories are prominent: Pre/Post-test, Accessibility, Design/Delivery, and functionality. To prepare for the next step, a new table is formed to examine the meaning of the data in these four categories. This table includes three columns: a category column (Pre/Post-test, Accessibility, Design/Delivery, and functionality), a column for the quotes/comments, and a column for the meaning/interpretation.

Interpretation of the data

This is the final step. This is where the analyst makes sense of individual quotes and analyzes the relationship between quotes (Rabiee, 2004). The analyst can find associations and develop strategies from the key objectives and features (Ritchie & Spencer, 1994) This is an essential step in determining recommendations for the next iteration. With the new categories, and similar quotes grouped together, meaning and relationships can be interpreted. This interpretation becomes the foundation for change and improvement. Context is important for each of these quotes. All the tables and data collection, including the transcripts and the recordings, must be available for this part of the analysis. The first category of this new table is the pre and post-test. There were 11 quotes I interpreted to mean, “Alignment of the test and training are important”. One example quote regarding alignment is, “I actually missed a few on the post test, too. I made notes of the ones that I missed, because I was like, ‘I know I read that somewhere.’” (MM). Another example of alignment is TE’s comment, “There were a few that I got wrong in the post-test and I feel like maybe those things should have been bolded in the training for emphasis on what we need to learn.” The next category is accessibility. This was a smaller category, and all three quotes were interpreted as “Need to follow UDL principles”. Two of the quotes were related to one picture of the training that was too small to identify on a cell phone, and one quote had to do with the contrast of the picture which made it difficult to decipher what was on the slide. The next category is the design and delivery. Three interpretations came out of this category. The first one appears four times and was the most prominent, and I labeled it as, “Prefers a more natural sounding voice rather than a computerized voice”. Some examples were, “I like that sort of natural cadence [of a real human voice]” (DP), and, “I was listening, and I was really glad to have it when **you** were talking, and then when it talks like a robot, I kind of ignored it and read it on my own.” (TE), and, “I like the various characters having different voices, but

the robot voice is terrible.” (MM). The final category is functionality. There was no common theme for this category. Interpretations included things like, “Check triggers/coding”, “Add a back button”, and “Make clickable zones larger”. One example of “Checking triggers” is a quote from TE, “I clicked on three things all at once, and all three computer voices talked at the same time and overlapped each other.” This can be fixed by ensuring the triggers that activate one audio stop when another audio is selected. Here is a quote illustrating the need to add a back button on the slides, “Having the choice to go back. I didn't realize that I'm used to having that until I didn't have it” (MM). This can be solved by adding a button that navigates backwards on each slide. Another quote from MM shows the need for larger clickable zones, “The D-R-D. The three letters: decontaminate, report, and document. I don't know why I click on whole words. I didn't click the letter. I clicked on that word. I didn't just click the letters, you know, but it didn't take me anywhere.” Storyline has a way to expand the area for clicking. The area needs to be stretched from the single letter, to the entire word.

Recommendations

After the interpretation of the data was complete, I created a new table of items to be revised (see table 5 below). It was helpful to have the new categories, as well as the meaning or interpretation associated with each quote to ensure the correct changes are going to be implemented.

Tests

The pre and post-test needs some attention, especially questions 3, 6, and 7, but a complete overhaul would be the best way to ensure complete alignment. As suggested by one participant (MM), who went back and checked slide information after taking the post-test, make sure verbiage matches on each question. There was also confusion in the way things were

worded. For example, one question asked about how one can become infected, and the wording should be changed to “What are the routes of entry”.

Accessibility

The biggest complaint that came out of the training was that the images (one in particular) were hard to see. Per UDL guidelines, since some learners may have a visual disability, and ensuring access means images and graphics should be accompanied by descriptions, in either text or spoken formats (Offer alternatives for visual information, 2018). And even though no disability was disclosed, UDL guidelines suggest optimizing strategies for teaching and learning that will benefit all people (The UDL Guidelines, 2018). Two participants were on phones and could not see the tiny pictures clear enough to make the proper selection. This universal design would benefit mobile users as well as users with a visual impairment.

Design/Delivery

Several areas for improvement came up as a result of this discussion (see table 4 below). While many aspects of the training were discussed in a positive light, the goal was to get recommendations for improvements. The focus group was in tune with this goal and the conversations gravitated to constructive feedback. One area is ensuring that all instructions and directions are explicit. Careful analysis showed that when one participant (NM) got stuck on a slide, it wasn't the function that needed to be addressed, rather the instructions were not explicit enough. She indicated she was waiting to be told how to get back to the content and did not realize there was a tiny red X to close out the screen. Another issue had to do with a cluttered layout on one of the slides. There was too much content crowding the screen on an interaction where participants were expected to select multiple items. The feedback came up in forms of talk bubbles, which did not disappear, and caused some confusion or slight frustration in finding the

remaining items. This was a design flaw. Another participant (TE) discovered that if she clicked on multiple things at the same time (which is not what the instructions indicate-another cause for extra explicit directions) that three computerized voices would talk at the same time. This is a programming fix but affects the delivery of the content. Participant (MM) is a learner who likes to review and double check information. There was no back button or previous button to take her back to the information she wanted to see. This affected the content delivery for her. I will need to add a back button. Participant (MM) clicked on the wrong section of an interaction (with written and audio instructions indicating where to click- yet another cause for explicit instruction changes). This can be fixed by making the area of the clickable field bigger. This affected content delivery for her. Many of the participants, with the exception of one (MS) didn't like the computer-generated voices. This is a major undertaking to find better quality text-to-speech automated voices that would interact with Storyline. There is possibly a substantial cost associated with purchasing this type of technology. Getting real voice actors to record each section would be time consuming, and perhaps costly as well. Since that is outside the scope of this project, the current computerized voices will remain in the training.

Functionality

Two of the participants completed the training on a mobile device (CO & NM). Both had trouble seeing the images, which were smaller than they would normally appear on a desktop computer. Storyline has a feature that will automatically adjust the layout of the screen to fit a mobile device or a tablet. I will check the settings to ensure it is compatible with smaller sized screens. Participant (DP) noticed that the timing was off on some of the voices and wording that was displayed on the screen. This function can be reprogrammed in the background. Two participants (NM & MM) indicated they got "stuck in a loop" during the scene survey section of

the training. This will need to be replicated in testing to see where the coding might be breaking down. One participant (MS) noticed one “next” button was cut off in the training. That could affect the function. That button will need to be identified and repositioned. Participant (MS) noticed a missing word from the displayed text on screen with what the computer-generated voice said. That can be identified and fixed fairly easily.

Table 4

Recommendations for Improvement

Tasks	Areas of Revision			
	Test	Accessibility	Design/Delivery	Functionality
	To be Completed			
Row 1	Re-write and make it more aligned with the training	Add descriptions on images	Make sure all directions are explicit	Check if the training is cell phone compatible.
Row 2	-	-	Redesign the scene survey so feedback talk bubbles disappear	Fix the timing on some of the slides
Row 3	-	-	Add back and previous buttons	Check scene survey section to ensure proper coding
Row 4	-	-	Redesign computer voice overlap	Align next button that is cut off the slide
Row 5	-	-	Redesign DRD interactive slide	Fix the missing word in the voice-to-text section

Reflection

Although I have been involved in the creation, implementation, and evaluation of eLearnings in my current job, I have not conducted a focus group, and laboriously dissected data to this degree. This was new to me, and quite challenging. The transcript was long, and the review and note-taking were time intensive. Rabiee (2004) notes that the large amounts of data generated during focus groups can feel overwhelming to a novice AND an experienced researcher, as well as the time it takes to analyze a full transcript of a 1-hour interview. I did experience the overwhelming feelings. I did experience the seemingly endless hours at the

computer sifting through the data. This gives me a new appreciation for researchers! While I see the value in this type of analysis, I fully expect to remain a novice.

A surprising and unexpected thing that came up was that two participants took the training on a phone (CO & NM). While I did not explicitly advise participants not to take it on a phone, I never thought they would. It would never occur to me to take it on a mobile device, but participant (CO) said, "...never underestimate, somebody's willingness to do things on their phone, that they would normally do on a computer." That is something that would need to be considered in future design implementations.

I learned a valuable lesson with the alignment of a test or quiz with the content of the course or training. Written tests are a sensitive area for me, as I typically don't perform well on those types of tests. I see why! The test creator must take careful measure to ensure that what is being asked can be answered, and what is in the training is explicitly on the test.

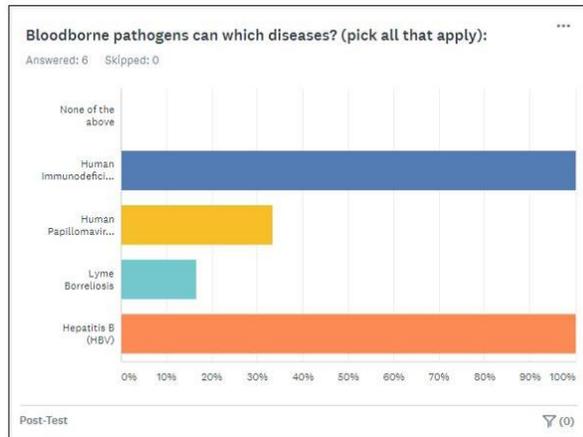
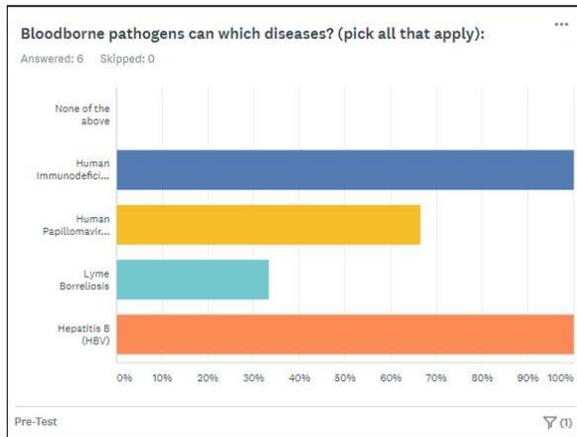
I do feel confident that the recommendations that came from the data collection are thorough and comprehensive due to the level of scrutiny that was given to each item, which was carefully categorized. Like I said, I do see the value in this laborious analysis of the data. It gives richness and depth to seemingly ordinary feedback.

Appendix A: Action Map

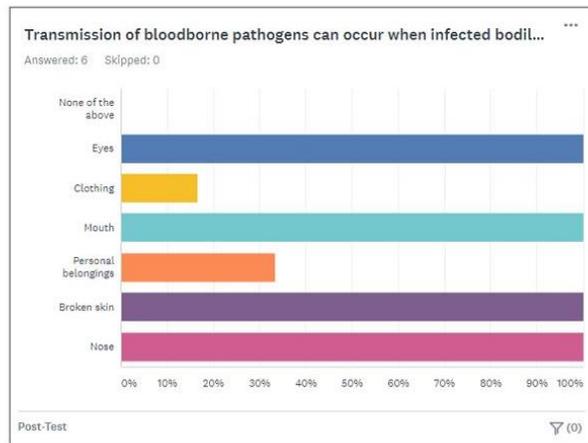
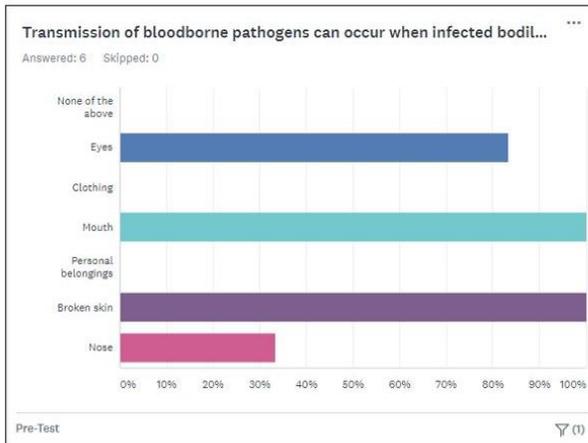


Appendix B: Test Results (Q 1-10)

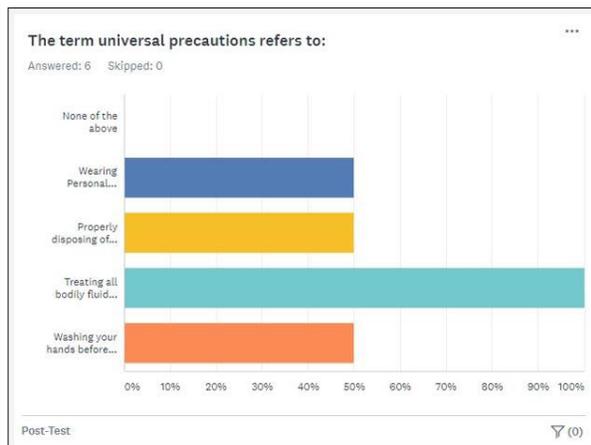
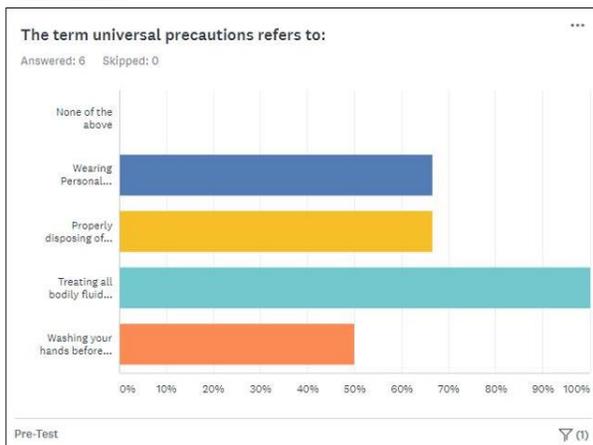
Question #1



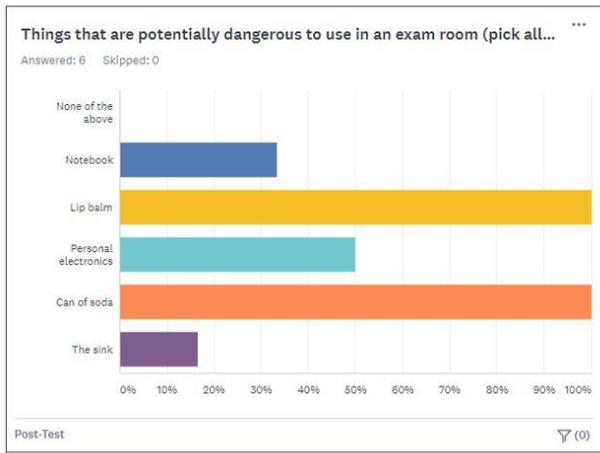
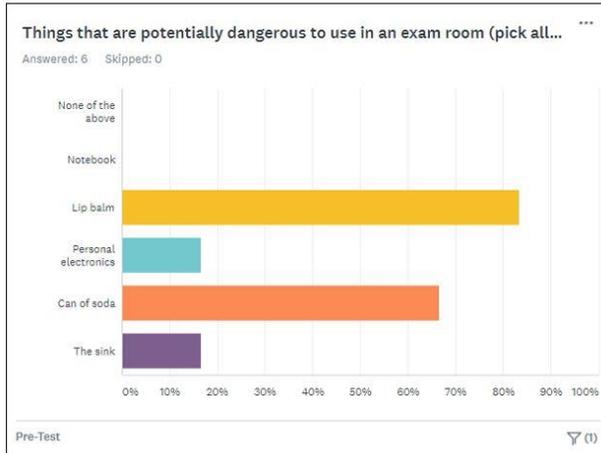
Question #2



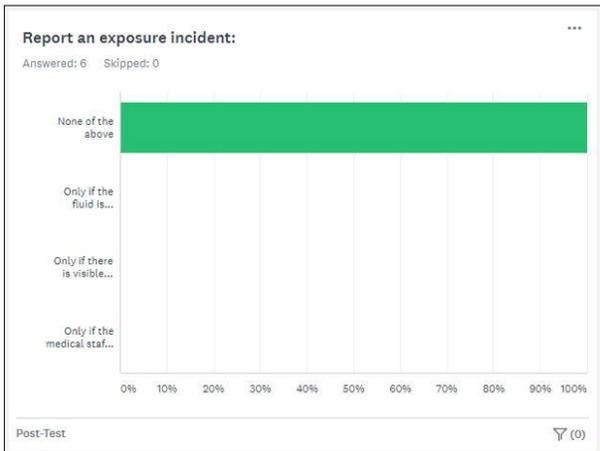
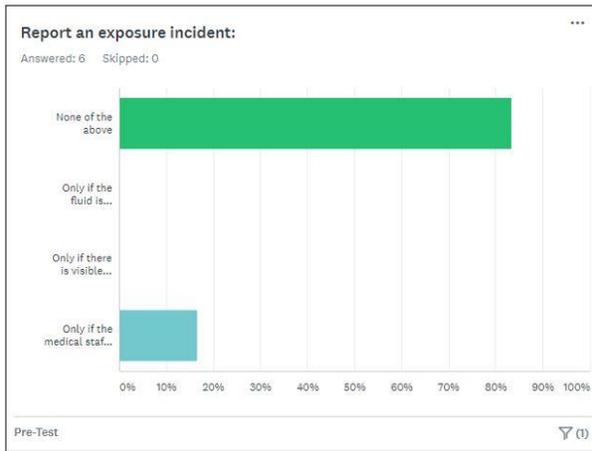
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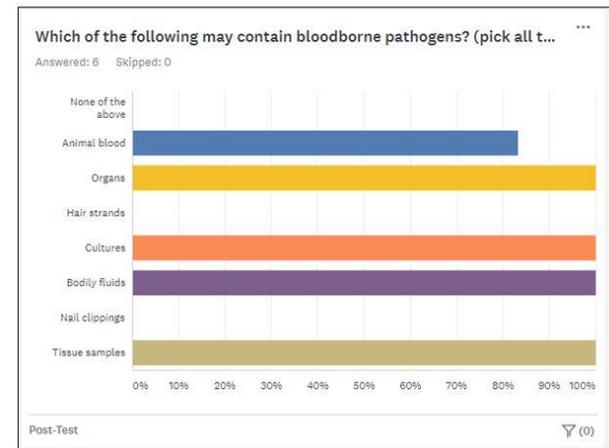
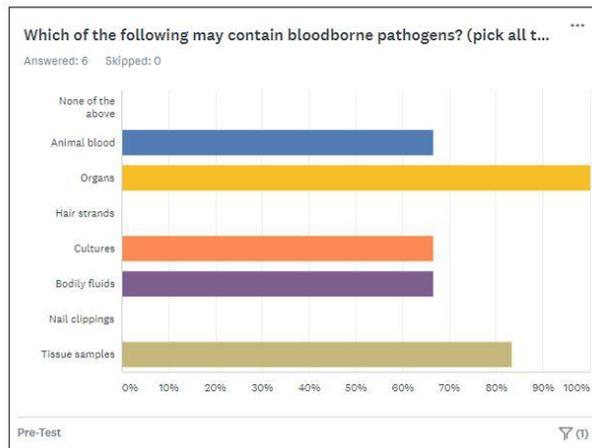
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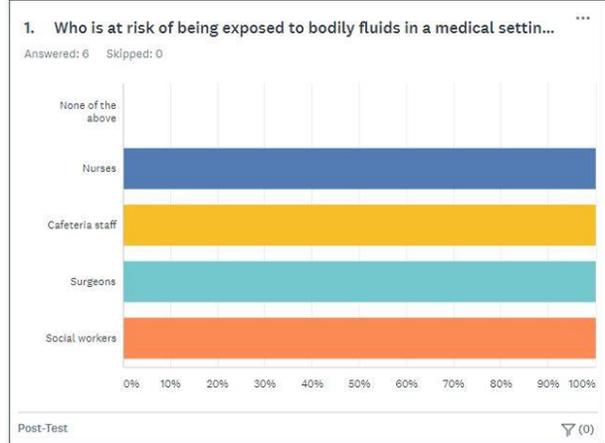
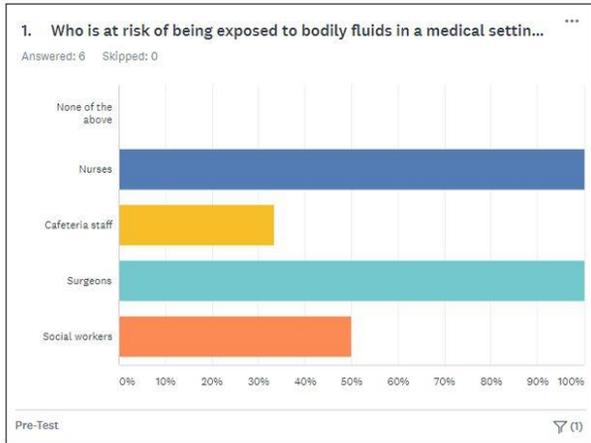
Question #5



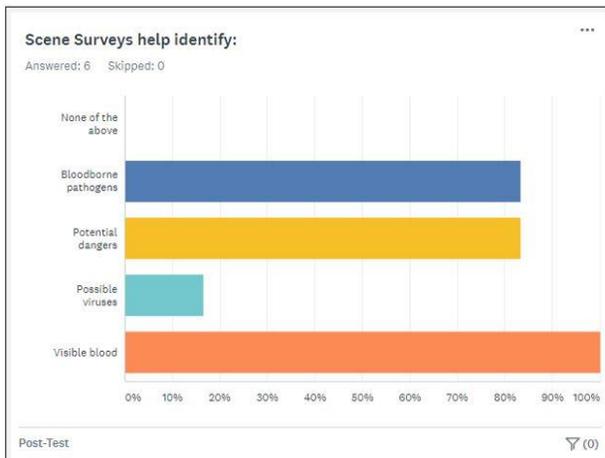
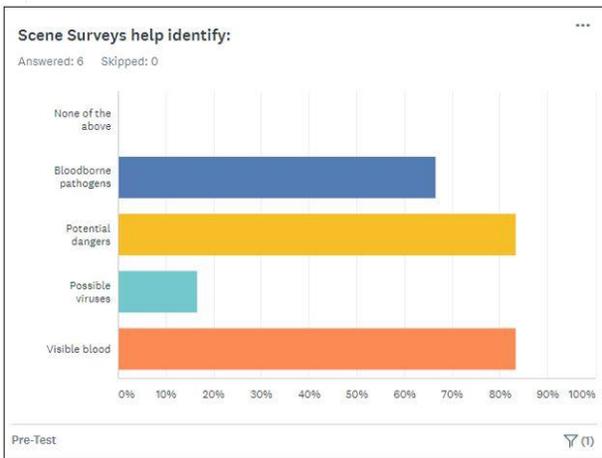
Question #6



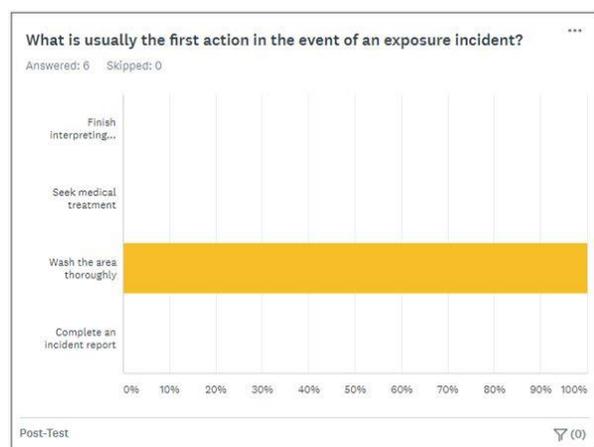
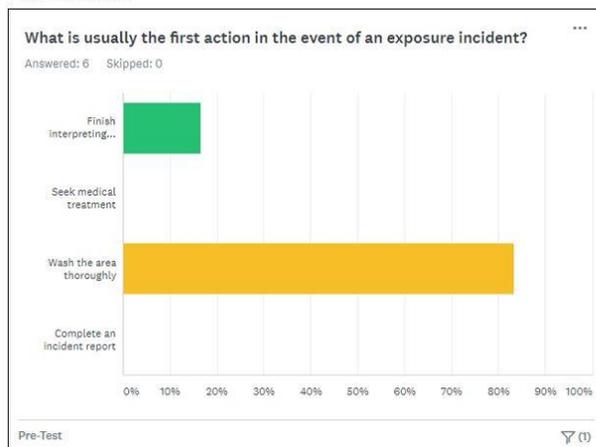
Question #7



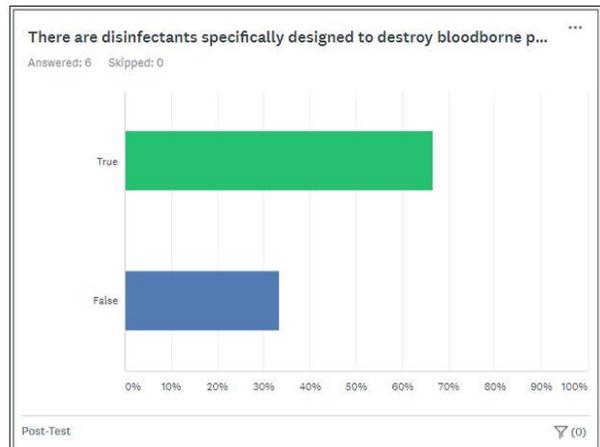
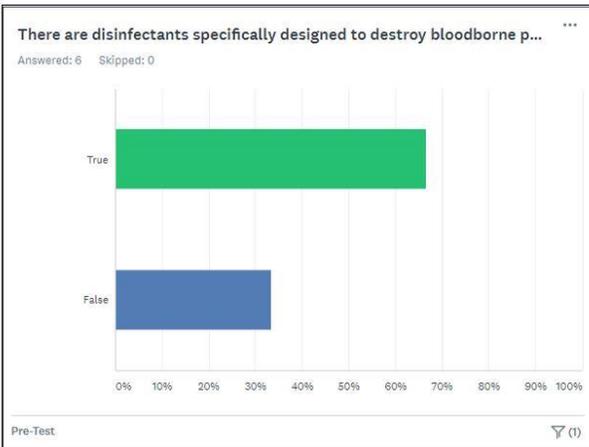
Question #8



Question #9



Question #10



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