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ORIGINAL PAPER

Instructional Design for Socially Distanced Compliance Audit

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Abstract
The COVID-19 pandemic made being socially distant an essential practice to upskill employees. As employers incorporate measures to keep employees socially distant from one another, they also need to consider technology to make this practice possible. Our project with a large state-wide, multi-campus food bank (FB) in the pacific northwest occurred during the late summer and early fall of 2020. The FB partnered with our group of three graduate students and one faculty member to improve self-audits of their coolers. This project used technology and rapid prototyping to design an instructional intervention that allowed social distancing in a workplace where employees were required to be present. We conducted a front-end analysis including training requirements, learner and environmental analysis and task analysis. This article describes the process of the analyses and design of instructional materials that allowed the FB to scale their audit process to their other warehouses.

Keywords Electronic job aids · Graduate students · Instructional design · Iterative design · Model · Performance improvement · Rapid prototyping · Workplace during COVID-19

The COVID-19 pandemic made being socially distant an essential practice to upskill employees. Typically, this means learning from home. However, more than 41 million people in the US work in spaces that risk exposure to COVID-19 at least once a month, and reducing these exposures helps protect workers and the communities they serve (Baker et al., 2020). As employers incorporate measures to keep employees socially distant from one another, they also need to consider technology to make this practice possible (Hughes, 2021) such as video training materials that can be watched at home in place of instructor-led training. Our project with a large regional, multi-campus food bank (FB) in the pacific northwest occurred during the late summer and early fall of 2020 during some of the tightest restrictions and mandates relating to the COVID-19 pandemic. This project used technology and rapid prototyping to design an instructional intervention that allowed social distancing in a workplace where employees were required to be present. An earlier needs assessment indicated that the FB needed both instructional (Freeman, 2020) and non-instructional interventions (Stefaniak, 2018) to improve its performance. These interventions included standardizing training, providing performance support tools, and creating feedback loops, as shown in Fig. 1.

The existing self-audits were not regular, systematic or documented, potentially posing a risk to the health and safety of their clients and employees. These changes would ensure required health and safety measures for FB accreditation.

In August of 2020, the FB partnered with our group from a large metropolitan research university in the pacific northwest to improve self-audits of their coolers. The project scope was identified through ongoing consulting work as part of a strategic partnership between two university instructors and a client who worked for the FB, dating back to 2018. During the academic year of 2018—2019, the outputs of this partnership included two completed organizational performance improvement needs assessment projects that were conducted as part of a needs assessment graduate course. These projects uncovered opportunities

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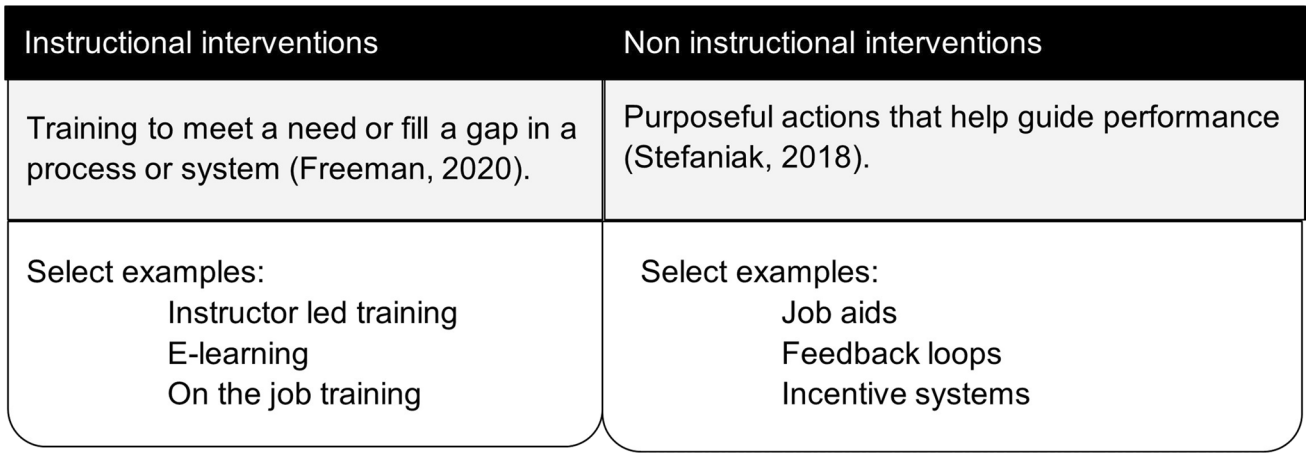


Fig. 1 Comparison of select instructional and noninstructional interventions. *Note.* The figure shows the categories, definitions, and examples of instructional and noninstructional interventions

to integrate standardized training, feedback loops, and job aids, to improve key organizational warehouse outputs and outcomes. The project we describe in this article is one in a series of projects to build that system of standardized training, feedback loops, and performance support tools.

The first three authors were enrolled in a graduate introductory instructional design course, whereby the design of the course required us to work with a real world client and instructional design project scope. We chose to work on this project specifically from a list of multiple different project descriptions with three different clients. The specific project description, humanitarian context, and available project roles are what drew them to sign up for this project. The fourth author served as the faculty instructor of the course. This author selected this project from a larger menu of other available projects with the client because it aligned with the department's instructional design course objectives, the instructional flow of the course, and the service-learning program designation requirements at the university.

Following the guidance of the Learning and Performance Support Instructional Design (LeaPS ID) Model, we collaborated to conduct a front-end analysis including training requirements, learner and environmental analysis and task analysis (Giacumo et al., 2020). We then developed performance requirements including the objectives, conditions and criteria in collaboration with the client. This led us to develop a task analysis. Through iterative design via rapid prototyping this became an electronic job aid (Google Form) for employees conducting warehouse audits. The job aid is accessed by capturing a QR code or web link on the employee's personal device to reduce shared touchpoints and maintain social distancing, which was critical to the health and safety of the workers and their communities during the COVID-19 pandemic (Baker et al., 2020). We also collaborated to create an instructional plan and performance assessment instrument to support the new expectation of all employees conducting warehouse audits.

Our goal for this project was to improve consistency with the cooler self-audits. We also decreased the number of times supervisors would need to conduct major audits of the cooler to ensure they were within the regulatory agency's guidelines for cooler warehouse safety. We increased the speed of addressing severe issues to prevent improper food storage and workplace accidents. This ensures the FB can pass safety inspections and maintain accreditation. Further impacts of this project include scalability for the FB. During our implementation period, the FB was preparing to move to a new warehouse that had a larger cooler. Our job aids were specific enough to be used, while general enough to work for the new cooler setup. The Google Form included a section to specify which cooler, or cooler section, was audited. This allows for additional coolers to be audited utilizing the same Google Form regardless of size or location.

Organization

Our client for this project was a large state-wide, multi-campus non-profit food bank (FB) in the pacific northwest. The client had been in operation for more than 35 years at the time of this project. In fiscal year 2021, the organization provided meals to over 195,000 community members living with food insecurity. The FB distributes food through a well-established network made up of hundreds of partners. These partners include educational facilities, organizations for the unhoused or food-insecure, churches, and other food pantries.

Opportunity

Findings from a previous needs assessment indicated that the FB would benefit from both instructional and noninstructional interventions to improve their cooler safety self-audit performance. Our client agreed to sponsor a project to create materials to support feedback loops such as standardized performance observation checklists and assessment protocols, standardized training materials such as instructor guides, and on-the-job performance support in the form of job aids. Additionally, we created interactive electronic forms to help train their employees on how to use these new processes. The FB reported that their self-audits were not regular, systematic, or documented, which pose risk to the health and safety of their clients and employees. The FB also wanted to safeguard their accreditation as outside auditors periodically formally assess the cooler operation.

From Theory to Practice – Analyzing the Performance Gap

The Van Tiem et al., (2012) HPT model, Mager et al. (1997) Performance Analysis Flow Chart, and Rummler's Nine Performance Variables (2004) among others, start with an analysis of the performance gap before designing any interventions. Therefore, we started with a performance gap analysis. The current performance was an informal, pen and paper audit with no reporting function. The client's goal for this project was to get employees and volunteers to conduct cooler audits daily. Figure 2 outlines the desired performance and indicates the actual performance.

Importance of Closing the Gap

Closing this gap will help the FB meet its organizational mission by safeguarding the health and safety of the clients served and ensure the foodbank is audit-ready all the time. Being prepared for a formal audit is imperative to the integrity and accreditation of the FB. Further, workplace accidents or clients falling ill due to improperly stored food would damage the reputation and result in major Occupational Safety and Health Administration (OSHA) and Food and Drug (FDA) repercussions, in addition to unintentionally causing harm to individual contributors or beneficiaries. The FB has a strategic initiative to support safety performance within the organization. Our project supports that initiative by providing training and job aids intended for self-audits. The tools we created ensure employees and volunteers are taking inventory of environmental issues on a regular basis, thus reducing accidents and food waste.

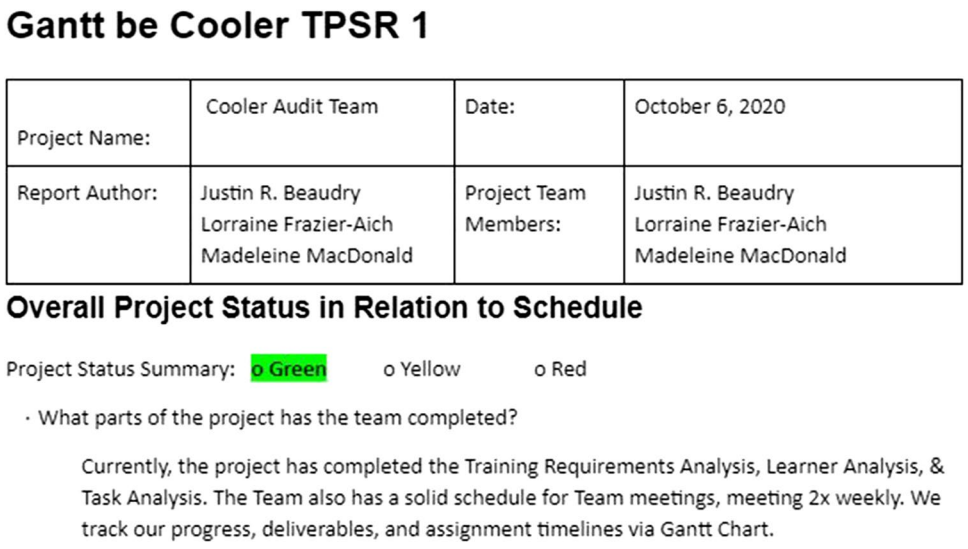
Collaboration

The academic institution has a long-standing collegial relationship with the FB in supporting their performance improvement projects. Faculty from the university regularly consult and partner with leaders at the FB to offer their expertise. Students, under faculty leadership, participate in performance improvement projects (e.g., including this instructional design project) while partnering with the FB as a client. This provides real-world experience for students to practice their emerging skills while giving the FB valuable technology (i.e., processes and tools) to aid in fulfilling their mission.

We, the graduate students in this project team, served as the primary instructional design and project management consultants under the leadership and supervision of our faculty course instructor, who served as the senior project manager and consultant. The team worked closely with one of the key compliance managers of the FB throughout the project. Each meeting was conducted over Zoom, recorded, and transcribed with permission from the client. The recordings were only used to verify information or for informal review by internal team members in case of an absence.

	Target Population	Performance	Standard
Desired Performance	We want our employees and volunteers	to conduct daily self-audits	that are correct and ensure we meet the guidelines for food safety and maintain our American Institute of Baking accreditation.
Actual Performance	What our employees and volunteers	are doing now is conducting audits from time to time only on an informal level	without corrective feedback loops, which risks the health and safety of the clients we serve.

Fig. 2 Desired and actual performance. Note. This figure shows the gap between the desired performance and actual performance, intended population, and standards of performance



Gantt be Cooler TPSR 1

Project Name:	Cooler Audit Team	Date:	October 6, 2020
Report Author:	Justin R. Beaudry Lorraine Frazier-Aich Madeleine MacDonald	Project Team Members:	Justin R. Beaudry Lorraine Frazier-Aich Madeleine MacDonald

Overall Project Status in Relation to Schedule

Project Status Summary: o Green o Yellow o Red

· What parts of the project has the team completed?

Currently, the project has completed the Training Requirements Analysis, Learner Analysis, & Task Analysis. The Team also has a solid schedule for Team meetings, meeting 2x weekly. We track our progress, deliverables, and assignment timelines via Gantt Chart.

Fig. 3 Example of part of our team TPSR 1. Note. This is the first page of our TPSR, which includes our project, names, date, status summary, and our response to the first question

Team Management

Constraints

Fall 2020 was fraught with uncertainty. The environment around us was hostile on many levels and it was hard to concentrate on completing anything; much less a project such as this. We had the benefit of working virtually together with a virtual client. This was by design because our team was spread across four states and three time zones. We are also novices and conducted this project as an experiential service-learning project under the instruction of our faculty. Doing anything the first time can be frustrating and time-consuming. Doing this under the additional pressures experienced in 2020 required even more organization and resilience than usual.

How Did We Do It?

Remaining positive by adopting a growth mindset was our first strategy for navigating graduate work in 2020 (Barbouta et al., 2020). Each of us had varying degrees of instructional design and project management experience, and we leveraged our combined knowledge and faculty instructor support to ensure success. The first three authors used this project to create opportunities to connect multiple times a week over Zoom to work through our deliverables, build rapport with each other, and support each other in our individual experiences. These virtual meetings also allowed us to share hobbies, jokes, and foster connections that are traditionally experienced over the water cooler or across cubicles in physical workplaces. The fourth author clarified expectations and joined our Zoom meetings on occasion, to provide feedback and guidance, and assure us that we were heading in the correct direction (Rao, 2016).

Building a team charter was our first step in beginning this project. The team charter defined roles, communication methods, goals and what not to do, in alignment with Rao's (2016) suggestions on how to collaboratively build effective teams. It discussed file management, success factors and outlined our conflict recognition and resolution plan. Outlining these elements at the formation stage was pivotal in helping us understand the role we played as part of the team and addressed potential pitfalls up front (Tuckman, 1965).

Organizing our time and understanding the individual components that made up our deliverables were vital to the success of our project. We employed project management best practices to ensure we remained on track and completed deliverables on schedule (Barbosa et al, 2021). The first author of the team developed and managed a project-specific Gantt chart and used it as a guiding tool during each team meeting.

We also conducted team progress status reports (TPSR) to reflect on and improve our team performance (Giacumo et al., 2020). A portion of our first TPSR is shown in Fig. 3.

TPSRs were completed periodically and reviewed by our faculty instructor. These formative evaluations reported our project schedule, the tasks we had completed, teamwork successes and areas of opportunity and any roadblocks to our progress (Giacumo et al., 2020). We also referred to the five stages of team development (Tuckman, 1965) in our TPSRs to acknowledge when we were performing optimally and when we were struggling and could use some support. This holistic and realistic approach to managing our virtual team instructional design project was one of the factors that produced a successful end product (Giacumo et al., 2020). This project was nominated and won an Association of

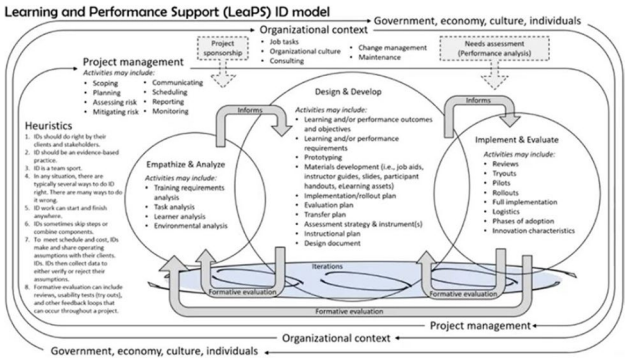


Fig. 4 ID model explainer video. Note. This video explains the LeaPS ID model

Educational Technology Communitcations (AECT) Honoring Educational Revolutions in Online (HERO) Practice Award for Workforce Learning.

Methodology

Models

Synchronous Analysis Model

To begin, an organizational and performance analysis was conducted as part of a previous needs assessment project by some of our colleagues, including one of the authors. The results of that data collection process were analyzed with the Synchronized Analysis Model (Marker, 2007). This model is an expansion of Chevalier's updated (2003) Behavioral Engineering Model, and is used during a cause analysis to identify the causes of performance on three levels: job, organizational, and external. The needs assessment revealed that there were knowledge gaps and feedback systems gaps at the worker and organizational levels. Therefore, we endeavored to create training materials, a job aid, and a performance assessment instrument, which could be utilized by managers and leads to upskill employees and volunteers in the organization.

LeaPS ID Model

The primary model used throughout this project was the LeaPS ID Model. This model is a hybrid ADDIE-based model incorporating elements of both Gagne's and Merril's work (Giacumo et al., 2020). It was created to integrate design thinking with a more modern iterative, highly contextualized, culturally responsive, agile approach to a systematic and systemic instructional design process. We had a limited time frame available to complete this project, thus we chose to use this ID model for a few reasons. First, this model helped us take an agile approach (Villachica et al., 2021). Second, it provided us with clearly defined steps within our process (Giacumo et al., 2020). The model is shown in the following video (Giacumo et al., 2020), linked in Fig. 4.

Iterative Design

Iterative design and rapid prototyping were used in many facets of the project given the fairly short time frame (i.e., one semester) our team had to complete this project. Iterative design is supported by the LeaPS ID Model (Giacumo et al., 2020), used to guide our project. The best example of this is the paper-based and electronic job aids we created. Both the paper and electronic job aids themselves began their lifecycle as two separate documents.

The first document that contributed to our job aid was a spreadsheet. The spreadsheet had the questions that needed to be answered by the audit for supervisor knowledge. Having the spreadsheet separate would allow us to see which questions would need to be branched based on the answers provided. We eventually used it to create an electronic job aid as part of a pilot opportunity to decrease the shared touch points

Fig. 5 One portion of the cooler audit task list. Note. This task analysis shows three subtasks and the steps required to complete each of the subtasks required to conduct a cooler audit

iii. Racks
  1. Look at product to ensure compliance for storage requirements
  2. Ensure food is stored above allergens
  3. Clean or dispose of any product that has been contaminated
    i. Record observed issue and action taken
    ii. Take picture with camera if issue needs follow-up

iv. Wall/floor junctions and corners
  1. Observe and remove any pest or pest debris
    a. Record observed issue and action taken
    b. Take picture with camera if issue needs follow-up

v. Floor
  1. Place product stacked on floor or in walking area on appropriate racks
    a. Ensure food is stored above allergens

and support better social distancing in the warehouse. The client had only used paper-based job aids prior to our project and was willing to pilot an electronic approach because it would streamline the process and decrease touch points.

The next document was a classic task analysis. Part of this work articulated the accurate, complete, and authentic tasks, subtasks, and steps (Villachica et al., 2021) required to conduct a cooler audit and reminders as shown in Fig. 5.

After we finalized the task analysis with images provided by our subject matter expert (SME) and confirmed its applicability to all 4 site locations with the client, we would then turn it into a paper-based job aid. The job aid would need to support the desired performance of the employees and volunteers who would be responsible to conduct cooler audits. In it, we added additional images, visual design, and branding. It would be integrated into training materials for new employees, volunteers, and available next to the cooler in the warehouse. As we evaluated both documents' effectiveness, our team was able to quickly make changes before the final document was created as a Google Form by combining these two documents into a final form. This form served as our electronic job aid. The client bought a tablet so that the employees and volunteers could later pilot the electronic job aid.

Backward Design

While designing items for the job aids, we leveraged the Backwards Design model from McTighe and Thomas (2003). The Backwards Design model focuses designers on working with clients to articulate desired results first, then create the assessment criteria, and finally create instruction. Our team adopted this model by focusing on articulating what the end results of a successful cooler audit would return as results and then backfill the information into a job aid and an accompanying instructor guide for use in learning and performance support environments. There is a criticism of this approach that you are teaching to the test, instead of teaching the material needed to pass the test. However, in our case we need the end result of the audit performance to be consistent regardless of which employee conducts the daily audit and our assessment is aligned with the authentic performance observation context. The backwards design process is shown in Fig. 6 (Martin et al., 2019).

Front End Analysis

After we worked with our client-partner to articulate the actual and desired performance (Gilbert, 2007), the team completed our front-end analysis process outlined in the LeaPS ID Model under Empathize & Analyze (Giacumo et al., 2020). This included the development of documentation including:

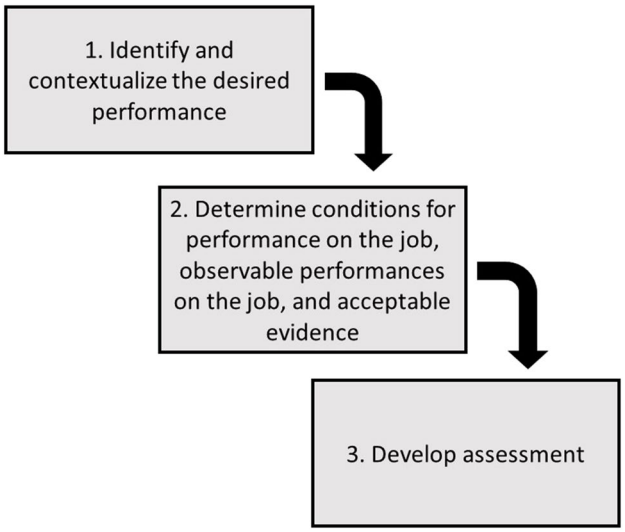


Fig. 6 Our backwards design process. Note. This figure describes what we did during each step of our backward design process

1. **Training Requirements Analysis**, which analyzed the performance gap and its alignment with FB's strategic goals, along with what needed to happen to secure sponsorship that would enable us to create materials that would be valued, implemented, and maintained.
2. **Learner and Environmental Analysis** to describe at a high level what food bank employees and volunteers already know, need to know, and the contextual factors that can affect learning (e.g., motivation, the learning environment, and the transfer to performance environment).
3. **Task Analysis** a procedural analysis based on the different sections of the cooler, paying special attention to those items that posed a risk to health and safety.

The client evaluated each component of the project and gave feedback. We used this feedback to make revisions. We iterated until our analyses vividly described the environmental and behavioral supports (Chevalier, 2009) of the performance problem.

Learner Analysis

A thorough analysis of the learners was conducted by reviewing the previous needs assessment and interviewing the client. Data was gathered during an interview between the team and the FB client. This interview took place in September of 2020. Notes were taken during the recorded interview and also transcribed. We referred to both the needs assessment project findings that we previously shared and the interview transcript during the creation of the learner and environmental analysis.

Our learner analysis followed andragogical theory to consider the adult learner's previous experiences (Merrill,

Learner Characteristic	Findings:	Data Source/ Method:	Instructional Implications: Ideas about what the training should do
Ages	18+ Estimate the average is between 40 - 50	Interview with client	Training should focus on more direct approaches, respecting the knowledge gained through age. Less focus on introductory "how to be an employee" type situations.
Language	English	Interview with client	Training does not need to be concerned about translation into other languages.
Experience	Some long-term employees, some employees with past cooler experience, some employees have non-cooler warehouse experience.	Interview with client	Initial training should be built under the assumption basic warehouse knowledge is already acquired, but cooler knowledge will be a net new. This should ensure all employees are on the same level playing field.
Gender	Mostly males. six males / one female	Interview with client	Training can likely lean slightly towards males in graphical elements, or ambiguous silhouettes. Pronouns should stay neutral (they/them) to stay neutral. Training should stay neutral as it pertains to culture, in case the differences become prevalent later.
Diversity	Volunteers are mostly retired and represent the state's census demographics	Interview with client	
Skills – Auditing the cooler Self-Check each entrance.	Want the skill set to be done the same every time an employee walks into the cooler	Interview with client	Standardized materials that also include mnemonics and bright snappy job aids can help form a good base to avoid a lackadaisical approach due to repetition.

Fig. 7 Learner analysis. Note. This table shows learner characteristics and instructional design implications

2002). We asked about the demographic makeup (age, gender, language, etc.), experience, skills, and receptiveness to changes in their job requirements in the past and incorporated them into the design of the learning experience.

The learners in this analysis were identified as current employees or volunteers all over 18 years of age with an average age ranging from 40's to 50's. All learners are fluent English speakers and have a variety of education levels from high school equivalent to postgraduate degrees. Some learners have prior experience in warehouse and food pantry settings; others have no prior experience. Employees and volunteers are mostly men. Learners are receptive to further training but do not like paperwork.

Cultural Considerations for Learners

Empathy is an important component of the LeaPS ID Model (Giacumo et al., 2020), and the team considered the characteristics of the learners and how their demographics and experiences may affect the way they receive training. Our ideas on how to approach our design based on the demographics of the learners are outlined in Fig. 7.

Three Contextual Factors for Learners

From our experience working as instructional designers, we understand that training is often the first or only considered solution when bridging a performance gap. In this project, we identified that the learners were receptive to new training through discussions with the compliance manager. However, current employees understood that the content covered in the training and job aids were requirements of their job; they just were doing the audits infrequently, to a variety of standards, and without documentation. Therefore, we realized that to deliver the desired results we would need to deliver more than just training alone. Hence, we took a whole systems approach to training and performance improvement. This meant that our performance improvement solution package would be multifaceted.

The client shared that they want employees to perform the self-audit process consistently and with fewer errors. The current performance determined that employees may look at the environment but not *see* the issues in front of them. Also, according to the client, the audits were not being performed consistently. This led us to ensure job aids gave visual examples of desired cooler assessment results (e.g., free of leaks, temperature below 41 degrees Fahrenheit, allergens correctly organized) as shown in Fig. 8.

The second contextual factor considered by the team was that the FB was moving to a larger cooler storage facility. This would certainly increase the length of time it took to do self-audits, and the cooler would have a new layout. While this would not change the type or frequency of tasks, it was important to ensure training materials were generic enough to apply to the current and future environment. Therefore, we chose backgrounds of warehouses that were generic to use in the job aid as shown in Fig. 9.

Third, we understood that some employees and volunteers did not conduct cooler audits regularly and thus we knew we needed to help build feedback loops in the system. Therefore, we built a performance assessment tool. This tool would help managers implement accountability feedback loops through standardized observation, and spot checks would help ensure a standardized approach and accountability.

Fig. 8 Cee what really could fail mnemonic. Note. This mnemonic was included in the job aid to assist employees' memory recall when inspecting the cooler from top to bottom

Results

Design Considerations

Based on the understanding of the learners, the following design considerations for training were identified:

- Direct approach that respects knowledge gained through age (less focus on "how to be an employee")
- Since learners were English-speaking, no need for translation
- Use language accessible to both long-term and new employees
- Gender and diversity-neutral pronouns and culturally representative
- Skills—standardized job aids to ensure consistency and reference materials were available on the floor for infrequent volunteers, bright, snappy job aids that are simple to consistently use so learners do not use it a few times and then sweep it under the rug. Mnemonics can provide support to move through the audit sheet quickly.
- Job aids that are generic enough to use in their current and future environments
- Initial training in person and job aids as daily reminders for self-audits.

Fig. 9 Example image we created for the job aid. Note. This image shows the factors to consider in a cooler audit

Fig. 10 Delivery mode and rationale

Delivery Mode	Rationale
Initial employee training **Delivery Style:** Instructor-Led Training (ILT) (preferably in person and on-site) **Note**: While the COVID pandemic is still present, precautions should take place as needed and required by laws. **Materials**: Facilitator Guide, Performance Assessment Instrument, Training Manual	In order to ensure all employees are on the same initial ground floor, an initial ILT training should take place. This training will discuss overall needs and reasoning for the audits as well as the importance of American Institute of Baking (AIB) Certification. Discussion on how to properly self-audit during walk-throughs of the cooler systems. How to use Job Aids and other provided material.
On-Site Job-Aids **Delivery Style:** Poster Presentations **Materials**: Multiple poster-style job aids to be created to remind employees of the importance of proper self-auditing behaviors.	These on-site job aids will serve as daily reminders for employees to think about cooler safety and self-audits, daily. Possibly, suggesting a way to allow the posters to rotate, so that people do not see the same posters all the time. Utilize mnemonic devices, if possible, to aid memory (Ex. Please Excuse My Dear Aunt Sally – math order of operations)

- Use performance assessment instruments to increase accountability and build stronger, more standardized feedback loops.

Mode of Delivery

We collaborated with the client and developed training requirements detailing the objectives, conditions, and criteria (Mager, 1997) necessary to perform the major tasks required of an employee conducting an audit of the cooler. These included: Gather Resources, Access Checklist, Fill out Checklist while Observing Cooler; Complete Checklist and Report Critical Issues to the Supervisor. The next step was to create a Task Analysis, described as "the process by which a broad set of information is broken down and chunked into a series of subtasks." (Shipley et al., 2018). This added more detail to the subtasks of the performance requirements. Figure 10 below shows the delivery mode and rationale for each component of the training package that we created, aligned with the major tasks derived from our task analysis.

Task Analysis

In the task analysis we inventoried:

- each task, and which were critical, difficult or complex
- the goals, triggers and resources used for the task
- Standards that the completed task should meet
- Task duration, frequency and prerequisite skills

Fig. 11 Task characteristics and findings

Task Characteristic	Findings
Major tasks	Conducting Cold Storage Self-Audits
Goals for each major task	Maintain compliance with food safety requirements and preparation for third-party audits and onsite inspections
Cues that trigger task performance	Monthly third-party audit, daily checklist, observation of non-compliant issue
Resources people use to complete the task	Job aid checklist outlining all items to inspect, writing utensils, camera for recording images of major issues (optional), flashlight to illuminate corners and dark spaces
Standards that the completed task should meet	Checklist is completed and all items are in compliance, monthly third-party audit returns no major issues
Task duration	30 minutes
Task frequency	Once per day or as needed when non-compliant issue is observed
Prerequisite skills	Reading and writing, ability to walk, bend, stoop, and visually observe environment, knowledge of camera (optional)

Fig. 12 Example Task List

Task List

1. Gather Resources
   a. QR Code
   b. Internet Connectivity
   c. Online Checklist
   d. Smartphone or Tablet with QR Code Reader
   e. Kaspersky QR Code Scanner App
   f. Paper Copy of Checklist as Needed
   g. QR Code affixed to outside of cooler

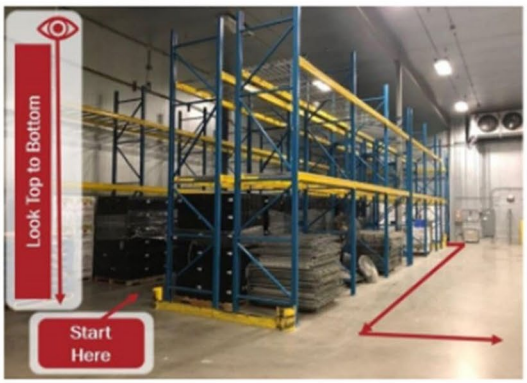
2. Access Checklist
   a. Open QR Code reader on phone or tablet

> ⚠ **Hot Tip: If you do not have a QR Code reader, download Kaspersky QR Scanner for Android or iOS**

   b. Scan QR Code on outside of cooler to open online checklist

   c. If can't scan QR Code, retrieve paper checklist

3. Fill Out Checklist while Observing Cooler
   a. Fill in basic information
      i. Include name
   b. Read instructions
      i. Begin on one side of the cooler and walk through each row of racks while conducting inspection



The purpose of this task analysis is to break down the steps that exemplary performers (Giacumo et al., 2020) follow when conducting a cooler audit. This step will ensure success in the design and development stage as we continue to follow the LeaPS ID Model. The task characteristics and findings are outlined in Fig. 11.

The task analysis became the job aid for employees conducting audits in the cooler. Because employees were not open to more paperwork and the client wanted audits to be documented, we transformed the job aid into a Google Form (survey) that employees submit upon completion. Once completed, the Form was automatically sent to the supervisor's inbox so she could review any issues. Data was also plotted in an excel spreadsheet automatically so she could view recurring issues.

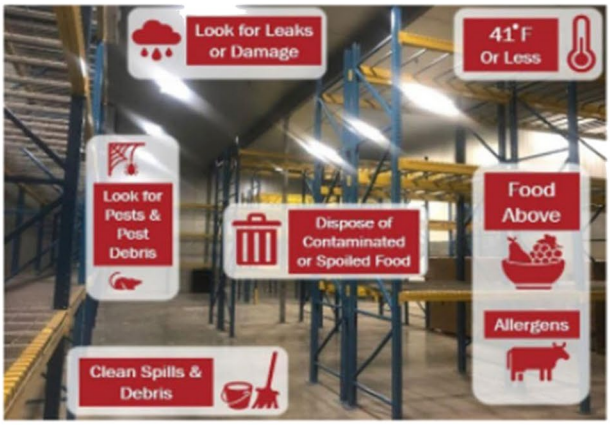
Task List

We also produced a task list, which is like a recipe but for a desired performance that is relatively routine. We

Fig. 12 (continued)

c. Inspect from top to bottom while observing the ceiling, walls, racks, corners, and floors

d. Look for any of these issues while inspecting



4. Document Cooler temperature (should be 41 degrees Fahrenheit or below) in the checklist

5. Ceiling/Overheads
   a. Using the checklist, check off any leaks, condensation, falling material, pests, dust/dirt accumulation, mold, mildew, structural damage, and cracks.

If	Then
There is an observed Issues	Describe issue in checklist
If action can be taken	Describe action taken in checklist

used a hierarchical list to organize each step and substep (Villachica et al., 2021). The entire task list went through the process of auditing the cooler and included rough drafts of supporting images as visual aids. If/Then statements were used to help users address issues found during audits. Difficult or complex tasks were highlighted with a "Caution" note and icon. Part of the task list is shown in Fig. 12.

Technology-Focused Job Aid

Our project with FB took place during the late summer and early fall of 2020. This fell in line with some of the tightest restrictions and mandates relating to the COVID-19 pandemic. Our team quickly shifted gears to look for ways to minimize shared touch-points within our solution.

Fig. 12 (continued)

6. Walls
    a. Using the checklist, check off leaks, condensation, pests, dust/dirt accumulation, mold, mildew, food residue, structural damage, and cracks.

If	Then
There is an observed Issues	Describe issue in checklist
If action can be taken	Describe action taken in checklist

7. Racks
    a. Using the checklist, check off any contaminated products, product spills, food residue, improperly stored allergens, unsafely stored products, debris, pests, dust/dirt accumulation, mold, and mildew.
    b. Move products so they are easy to access

⚠ **Ensure food is stored above allergens**

If	Then
There is an observed Issues	Describe issue in checklist
If action can be taken	Describe action taken in checklist

8. Wall/floor junctions and corners
    a. Using the checklist, check off any product spills, food residue, debris, pests, dirt/dust accumulation, and structural damage.

If	Then
There is an observed Issues	Describe issue in checklist
If action can be taken	Describe action taken in checklist

9. Floor
    a. Using the checklist, check off pests, food residue, food waste, spills, and trash.
    b. Clear pathways
    c. Place product stacked on floor or in walking area on appropriate racks or pallets

⚠ **Caution: Ensure food is stored above allergens**

If	Then
There is an observed Issues	Describe issue in checklist
If action can be taken	Describe action taken in checklist

10. Complete Checklist and Report Critical Issues to Supervisor
    a. Checklist
        i. Before submitting, make sure checklist is filled out completely
    b. Report Major Issues to Supervisor:
        i. Pests/pest feces/bug infestation
        ii. Leaking
        iii. Allergens stored above produce
        iv. Mold/mildew
        v. Falling materials
        vi. Spills
        vii. Temperature lower than 41 degrees

Instructional Design Feature	Corresponding Technology
Performance Trigger	QR Code
Job Aid	Google Forms
Reporting Tool	Google Sheets

Fig. 13 Design features and technological interventions that minimized touch-points. Note. This figure shows learner characteristics and instructional design implications

Fig. 15 Paper job aid vs. Electronic job aid. Note. The image shows that paper and pencil job aids create opportunities for COVID-19 exposure. Electronic job aids reduce touch points and safeguard the health and safety of FB staff and community

This presented an opportunity to use more technology within our solutions as shown in Fig. 13 below. Risk from COVID-19 was minimized by focusing on how we could implement electronic features to minimize shared spaces and devices.

Google Suite

Google Forms are not unknown tools. Google Forms, a part of the Google office suite, were already used by the FB, reducing the amount of time needed to train FB supervisors. Google Forms also interact with other Google tools, such as Drive and Sheets, making it easy for FB to analyze data from the Google Form and share it with other managers. This was important as the results of our learner analysis indicated employees did not want more paperwork and also had smartphones. The FB also had a limited budget to spend on technology. Thus, we designed a Google Form so that as employees fill out branching questions, they get alerts to contact supervisors immediately depending on the severity of issues found. Figure 14 shows an example of the results recorded by Google Forms.

QR Codes

To access the Google Form job aid, we created a QR code that was taped to the outside of the cooler so that employees could scan it with their smartphone to immediately access the form. QR codes, scanned from one's own personal device, reduce the risk of transmission in several ways as mentioned in Figure 15. First, employees are not sharing (touching) the same materials (clipboards and pencils) as they can scan QR codes with their personal devices. QR codes bring the user to the same website, regardless of the

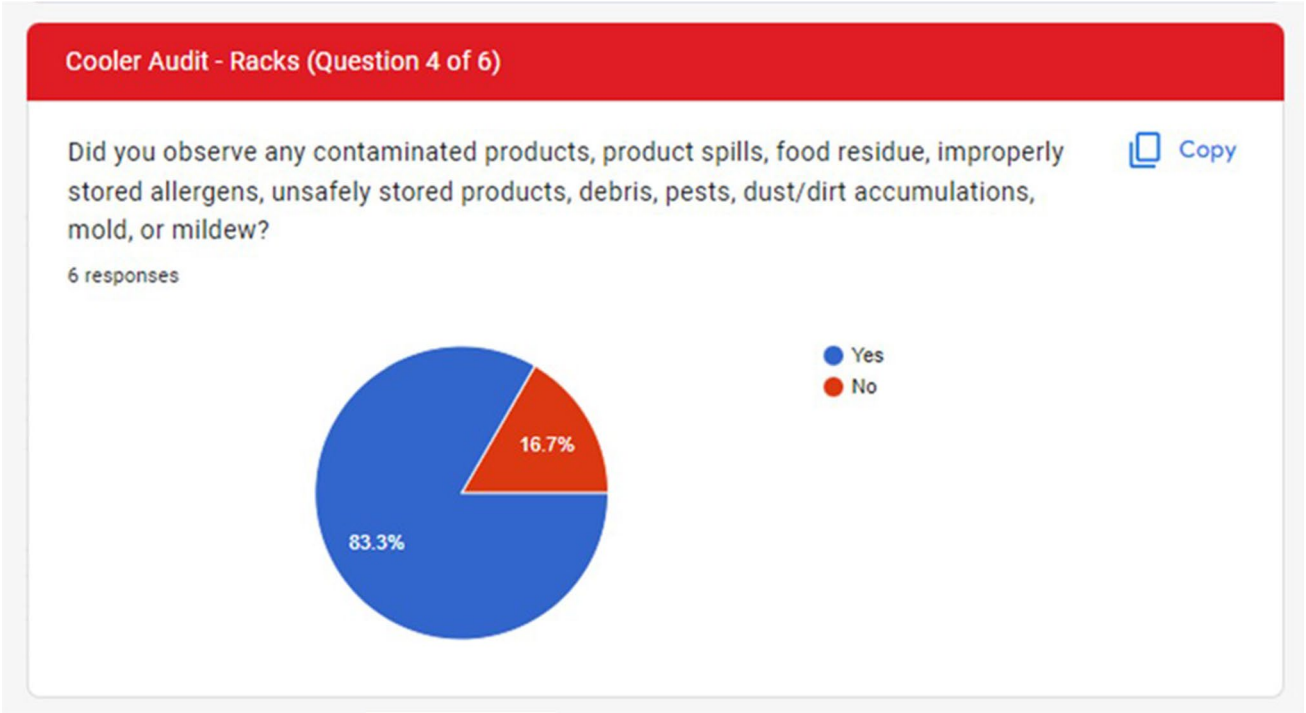


Fig. 14 Google form audit results. Note. This graph shows the responses collected through one of the audit questions

Assessment Checklist

Did the learner:	Trial 1	Comments
(1) Gather Resources		
Get their smartphone/tablet or retrieve a paper checklist/writing utensil if internet connectivity is down?	☐Yes ☐ No	
(2) Access Checklist		
Access the online or paper checklist?	☐Yes ☐ No	
(3) Fill out Checklist while Observing Cooler		
Write their name?	☐Yes ☐ No	
Enter the Temperature of the Cooler?	☐Yes ☐ No	
Ceilings/Overheads		
If issue present, checkmarks, describes, and notes action taken?	☐Yes ☐ No	
Walls		
If issue present, checkmarks, describes, and notes action taken?	☐Yes ☐ No	
Racks		
If issue present, checkmarks, describes, and notes action taken?	☐Yes ☐ No	
Checkmarks "pests", describes, and notes action taken **upon observing (fake) rats?**	☐Yes ☐ No	
Checkmarks "allergens", describes, and notes action taken **upon observing milk above produce?**	☐Yes ☐ No	
Wall/floor junctions and corners		
If issue present, checkmarks, describes, and notes action taken?	☐Yes ☐ No	
Floor		
If issue present, checkmarks, describes, and notes action taken?	☐Yes ☐ No	
Checkmarks "spill", describes, and notes action taken **upon observing water spill?**	☐Yes ☐ No	
(4) Complete Checklist and Report Critical Issues to Supervisor		
Fill out checklist completely?	☐Yes ☐ No	
Report critical issues of pests (fake rats) allergens (milk above produce) and spills (water) to you?	☐Yes ☐ No	
Report other critical issues they noted in the checklist (above) including pests, leaks, allergens, mold, mildew, falling material, spills, and temperature below 41°?	☐Yes ☐ No	
Tally the number if "no" responses	____ of "no" responses	
Are 3 or more "no" responses?	☐Yes ☐ No	No = Mastery Yes = No Mastery. Provide remediation.

◂**Fig. 16** Performance assessment checklist. Note. This checklist show the criteria and ratings (i.e., yes, no) for specific important behaviors and gives a way to evaluate the overall demonstrated performance

user or device. For those whose camera did not scan QR codes, we also included instructions for downloading a QR scanner and provided paper copies. Second, we decreased the need for employees to pass around tools (e.g., job aids, pens etc.), and therefore come within six feet of each other. Third, all Google Form self-audit results were automatically sent to supervisors, reducing the need for employees to personally hand-in results of their audits.

The QR code and Google Form were selected as tools because they were free and easy for the FB to edit if needed in the future. We used common tools in a unique way that did not cost the employer, created automated data collection, and was easy for employees to use.

Operating Assumptions

Operating assumptions are a set of statements that IDs use to collaborate with stakeholders in making decisions and to communicate constraints of the instruction (Villachica et al., 2021). Defining operating assumptions helped us outline the scope of our instruction and identify events that may trigger revision.

- Assume the tasks outlined in the audit will not undergo major changes after job aids and training are implemented
- English will continue to be dominant language spoken
- Job aids and training will be consistently used by leadership, new employees, and current employees
- Any person conducting audit possesses the skills and tools needed to perform the task
- Those using job aids and introductory training for the cooler are responsible for additional tasks outside of the cooler (warehouse, transportation)

Performance Assessment Instrument

Based on the results of the front-end analysis, we decided to create a mobile-responsive job aid with a paper job aid as a backup in the case of technology failure. The next step in the LeaPS ID Model is to develop a performance assessment instrument and instructional plan. The goal of this step is to measure "the learner's ability to do what you want them to do as described in the objectives" (Giacumo et al., 2020).

Harless (1986) and Clark (2008) suggest job aids supplemented by wrap-around "quasi-training" motivates employees and creates buy-in for the new expectation of conducting daily audits. In order to fulfill Harless' suggestion, we created a plan to support supervisors in training learners to conduct correct audits of the cooler.

Our instructional plan provided training materials for implementing the job aid, including a short training session for employees to practice accessing the job aid and learning how to appropriately respond to questions in the form. In addition, we provided a video tutorial for managers on how to access the data, change or add questions, and scale the form to fit other sections and departments. We also knew that FB experienced high turnover, and while fixing that issue was not part of the scope of this work—we believe this technology will be helpful in onboarding new employees. Figure 16 shows the assessment the instructor will use to observe the learners as they practice conducting audits of the cooler.

Discussion

Our project improved consistency with the cooler self-audits. This improved consistency decreased the amount of time supervisors would need to spend with their major audits of the cooler to ensure they were within the International Baking Association's guidelines for cooler safety. Within the Google Form, employees fill out branching questions alerting employees to contact supervisors immediately depending on the severity of issues that were found. The increased speed of addressing severe issues would also help ensure safety by preventing improper food storage and avoid any potential waste caused by food spoilage.

Further impacts of this project included easy scalability for the Food Bank (FB). During our implementation period, the FB was preparing to move to a new warehouse that had a larger cooler. This challenge allowed our team to focus on making solutions that would be scalable in scope. Our job aids were specific enough to be used, while general enough to work for any cooler setup. The Google Form included a section to specify which cooler, or cooler section, was audited. This allows for additional coolers to be audited utilizing the same Google Form regardless of size or location. Our project is now being used as a model for other students who would make more responsive job aids for the FB.

Conclusions

We used a systematic and systemic approach to improving organizational and employee performance at the FB during COVID. This project was successful. The FB compliance manager reported that they implemented the training materials, assessments, and are pleased with

the improved audit performance observations they have made.

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Declarations

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