Research Report 2035

A Tool Concept to Support Military Advisor Training Academy Instructors

Julia E. Brown
Kara L. Orvis
Chad A. Weiss
Aptima, Inc.

Alissa C. Fleming
U.S. Army Research Institute

December 2022

United States Army Research Institute for the Behavioral and Social Sciences

U.S. Army Research Institute
for the Behavioral and Social Sciences

Department of the Army
Deputy Chief of Staff, G1

Authorized and approved:

MICHELLE L. ZBYLUT, Ph.D.
Director

Research accomplished under contract
for the Department of the Army by

Aptima, Inc.

Technical review by

Nicole T. Harrington, U.S. Army Research Institute
Nathaniel L. Keiser, U.S. Army Research Institute

DISPOSITION

This Research Note has been submitted to the
Defense Information Technical Center (DTIC).

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. REPORT DATE *(DD-MM-YYYY)*	2. REPORT TYPE	3. DATES COVERED *(From - To)*
December 2022	Final	October 2020 – September 2022

4. TITLE AND SUBTITLE

A Tool Concept to Support Military Advisor Training Academy Instructors

5a. CONTRACT NUMBER
W911NF-21-F-0003

5b. GRANT NUMBER

5c. PROGRAM ELEMENT NUMBER
622785

6. AUTHOR(S)

Brown, Julia, E.
Orvis, Kara, L.
Weiss, Chad A.
Fleming, Alissa, C.

5d. PROJECT NUMBER
A790

5e. TASK NUMBER

5f. WORK UNIT NUMBER
505

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

Aptima, Inc.
12 Gill St. Suite 1400
Woburn, MA 01801

8. PERFORMING ORGANIZATION REPORT

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)

U. S. Army Research Institute
for the Behavioral & Social Sciences
6000 6TH Street (Bldg. 1464 / Mail Stop 5610)
Fort Belvoir, VA 22060-5610

10. SPONSOR/MONITOR'S ACRONYM(S)
ARI

11. SPONSOR/MONITOR'S REPORT NUMBER(S)
Research Report 2035

12. DISTRIBUTION/AVAILABILITY STATEMENT:
Distribution Statement A: Approved for public release; distribution is unlimited.

13. SUPPLEMENTARY NOTES
ARI POC: Dr. Alissa C. Fleming, Foundational Science Research Unit

14. ABSTRACT

As the need for U.S. Forces to train foreign partners has grown, the U.S. Army has met this need with the creation of Security Force Assistance Brigades (SFABs) that train and assist Foreign Partners. The Combat Advisor Training Course (CATC), hosted by the Military Advisor Training Academy (MATA), trains Soldiers and officers to serve as advisors in the SFABs. The cadre at MATA currently use paper-and-pencil assessment to record performance, which makes it difficult to transition information about a student's performance between phases of training. Cadre would benefit from a digital tool to record their observations, to quickly display a summary of results, and to easily share information between instructors within and between blocks. The purpose of this research was to develop an understanding of the instructor workflows and develop a concept for a digital tool which could support their assessment and feedback activities. The research team conducted multiple interviews with CATC instructors and spent two weeks on site to observe the course, where they conducted cognitive walkthroughs with instructors during their downtime to elicit feedback on tool concepts. Throughout the interviews and on-site observation, close attention was paid to specific challenges mentioned by instructors and observed in the course. These challenges were then translated into requirements for the tool concept design. Prototypes, a concept map, and key components of functionality were designed to meet these requirements. These findings are specific to the development of a tool for MATA instructors and are not generalizable. However, the information gained about SFABs and their training could benefit future related efforts.

15. SUBJECT TERMS
Teamwork, Assessment, Instructor tool, Security Force Assistance Brigade

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
					Stefanie P. Shaughnessy
a. REPORT	b. ABSTRACT	c. THIS PAGE	Unlimited Unclassified	29	19b. TELEPHONE NUMBER
Unclassified	Unclassified	Unclassified			571-585-1790

Research Report 2035

A Tool Concept to Support Military Advisor Training Academy Instructors

Julia E. Brown
Kara L. Orvis
Chad A. Weiss
Aptima, Inc.

Alissa C. Fleming
U.S. Army Research Institute

Foundational Science Research Unit
Stefanie P. Shaughnessy, Chief

December 2022

ACKNOWLEDGEMENT

We would like to thank the Military Advisor Training Academy (MATA) personnel who provided their time and allowed us to attend and observe training. Without that support we would not have achieved our research objectives.

MATA INSTRUCTOR TOOL CONCEPT

EXECUTIVE SUMMARY

Research Requirement:

The Combat Advisor Training Course (CATC), hosted by the Military Advisor Training Academy (MATA), trains Soldiers and officers to serve as advisors in the Security Force Assistance Brigades (SFABs). Instructors play a key role in the CATC. Thus, the purpose of this research was to develop an understanding of the instructor workflows and develop a concept for a digital tool which could support their assessment and feedback activities.

Procedure:

The research team conducted multiple distributed interviews with CATC instructors, followed by two weeks at the training site to observe the course and meet with instructors and course leadership. During the two-week course observations, the research team conducted cognitive walkthroughs with instructors during their downtime to design and elicit feedback on two complementary tool concepts. Following the interviews, a concept map and wireframes were developed to build out a more holistic tool concept.

Findings:

Throughout the interviews and on-site observation, close attention was paid to tasks and challenges mentioned by instructors and observed in the course. These tasks and challenges were then translated into requirements for the tool concept. Prototypes, a concept map, and wireframes were designed to meet these requirements. Two prototypes were developed during the on-site observations and focused on instructor assessment activities. One prototype depicted an instructor using an Apple Watch to make quick ratings using example individual advisor assessments. The other prototype depicted an instructor using an iPad with more functionality and example team assessments. To continue development of the tool concept, a concept map and wireframes depicting the tool were developed and briefed to MATA leadership a few months after the observations were made. The wireframes represented additional instructor activities related to logging in, course administration, and constructing and presenting after action reviews. The concept map provided details regarding the relationship and information flow between the different functions of the tool. In general, the instructors and MATA leadership thought a digital tool would be helpful to the instructors.

Utilization and Dissemination of Findings:

These findings are specific to the development of a tool for MATA instructors and are not generalizable. However, the information gained about SFABs and their training could benefit future related efforts to design a tool for instructors by providing initial requirements for software development.

MATA INSTRUCTOR TOOL CONCEPT

CONTENTS

LIST OF TABLES

LIST OF FIGURES

A Tool Concept to Support Military Advisory Training Academy Instructors

The U.S. Army established Security Force Assistance Brigades (SFABs) in 2018 to meet the growing demand for U.S. Forces to train and advise foreign partners. Advisors in the SFABs work as small teams to execute strategic missions in austere, isolated environments. The Combat Advisor Training Course (CATC), hosted by the Military Advisor Training Academy (MATA), trains Soldiers and officers to serve as advisors in the SFABs. The 54-day (8 week) course is a prerequisite prior to deployment where students learn technical and tactical skills needed to work as advisors. The course aims to teach Soldiers and officers the knowledge, skills, and attributes to assess, advise, support, liaise, and enable Foreign Security Forces (FSF).

Instructors play a key role in the CATC. They prepare educational materials; deliver training; manage scenario-based events; observe, assess, and grade students; and provide developmental feedback. Prior research activities conducted by the U.S. Army Research Institute (ARI) had uncovered that MATA instructors were experiencing some challenges with instructor handoffs between blocks of instruction and were largely utilizing pencil and paper-based tools to conduct assessments and take notes. The purpose of this research was to develop an understanding of the instructor workflows and investigate whether MATA instructors would benefit from a digital tool that supported their work activities related to assessment, after action reviews (AAR), and course administration. If there was such a need, this research would develop a concept for such a tool.

CATC Overview

The CATC is broken down into four blocks of training. Training includes instruction on principles of Security Force Assistance (SFA); cross-cultural communication; human behavior and building rapport; use of interpreter; and engagement, influencing, and negotiation. Tactical skills reinforced at CATC include advanced medical, communications, fire support, force protection measures, survival, and personnel recovery. The types of training methods employed at CATC include classroom instruction, practical exercises, and field training exercises (FTX). The blocks of training are as follows:

Block 1

The first block of training largely consists of classroom instruction. During this 2-week block, students learn the foundations of advising, including the role of the advisor, force protection, assessments and training development, culture, and basic mission planning. Students also conduct their first Key Leader Engagement (KLE) with their FSF counterparts.

Block 2

Training in the second block is focused on two primary areas—medical and fires—with one training week devoted to each topic area. The medical portion begins with the Tactical Combat Casualty Care (TC3) certification. This certification is required to deploy with an SFAB unit. Students receive instructions on how to perform care under fire, tactical field care, casualty evacuation, and how to treat burns. They also learn how to assess base camps. To receive their

certification, students must earn 70% on the medical exam. This phase of Block 2 also includes a mass casualty (MASSCAL) event and daily medical physical training (PT). The fires portion of Block 2 includes classroom instruction on joint firepower application and advising FSF counterparts on fires-related tasks. Not all Soldiers selected for SFABs come from an MOS (Military Occupational Specialty) that worked with firepower; thus, all students learn basics about ground, fixed, and rotary wing assets. In addition to the classroom instruction, there is also a written test to culminate Block 2.

Block 3

During the third block of training, students are separated from their teams and sent to advisor tracks. This 2-week block of training is where they learn specialized skills to complement their teams. For example, someone from an MOS with a heavy weapons focus may be sent to the logistics track to complement those skills. The specific specializations are as follows: foreign weapons, non-standard logistics, advisor battle staff, and senior leader.

Block 4

The final block of training is the FTX. The FTX is also two weeks, consisting of FTX1 in the first week and FTX2 in the second. Throughout the FTX, civilian role players perform as the FSF counterparts and translators. Overall, there are about 100 role players, 20% of whom are only fluent in either French or Dari when conversing with students, with the remaining 80% conversing in English. FTX1 is conducted in the MATA village, a training environment made to look like a foreign base. During the first week, students work on establishing rapport and training their FSF counterparts. The scenario is also adjusted based on how students perform; for instance, poor performance can lead to protests in the village or sabotaged equipment. During FTX2, students work closely with FSF counterparts to plan and conduct a large-scale operation. They also help their FSF set up an aid area and work with non-government agencies (NGOs). FTX2 also includes a protest among villagers, as well as multiple media interactions. The FTX culminates in an overnight field exercise.

The optimal attendance for a class is 60 students, and the maximum attendance is 72. Students are assigned to small ad-hoc teams of 8 to 12 at the beginning of the course. These teams are referred to as Military Advisor Teams (MATs) and there are typically four per class. During Block 4, more senior students are pulled from their MATs to create a Battalion Advisor Team (BAT). Instructors assign students to common advisor roles for the FTX. Sometimes, due to smaller team sizes, students are required to fill more than one role. The roles are as follows:

- Team Lead (usually officer—observed CPTs as most common)
- Assistant Team Lead (NCOIC)
- Senior Ops (enlisted, SFC)
- Senior Support (enlisted, SFC)
- Assistant Ops (enlisted, SSG/SGT)
- Fires (enlisted, SSG/SGT)
- Logistics (enlisted, SSG/SGT)
- Engineering (enlisted, SSG/SGT)
- Medic (enlisted, SSG/SGT)

- Intel (enlisted, SSG/SGT)
- Maintenance (enlisted, SSG/SGT)
- Signal (enlisted, SSG/SGT)

Upon completion of FTX2, students begin out-processing from the course. They are counseled based on their performance throughout the entire course. At any point in the course, a student may be recycled and sent back to attend the next class to recomplete a block of training. Upon graduation, students are sent back to their SFAB units.

Instructor Workflow

Instructors in the course have a wide range of responsibilities, but their primary responsibility is teaching and assessing students. During classroom sessions, instructors are responsible for delivering lectures and grading assignments. During PT and practical exercises, instructors are responsible for observing and capturing behavior. Throughout the entire course, instructors take notes and administer spot reports. Spot reports can be positive or negative and serve as a record of students' behavior. Typically, assessments and reports are not done in situ, but rather after an event has taken place.

Block 4 instructors are referred to as Observer Controllers (OCs) because they have the additional responsibility of controlling the scenario in the FTX. OCs work with the role players and translators to ensure the scenario stays on track and is responsive to the decisions the teams make. During this block of training, there are two OCs assigned to each MAT (one primary, one alternate); the BAT has four OCs assigned to them. The primary OC is responsible for the team and assessments, with the alternate filling in if the primary OC is unavailable. Table 1 shows a list of the assessments throughout the course.

Table 1

CATC Assessments

Assessment	Examples	Block 1	Block 2	Block 3	Block 4
Written Knowledge Tests	Standard evaluation of course content	X	X	X	
Peer Ratings	3 short yes/no questions and comments		X		X
Practical Pass/Fail Exercises	Joint firepower practical exercises, TC3 practical exercises, etc.	X	X		
Advisor Functions Checklist (OCs)	Internal/external by role				X
Advisor Attribute Assessment (OCs)	Patient, Empathetic, Sound Judgement, etc.				X
Spot Reports (OCs)	Standard Form (Positive and Negative)	X	X	X	X
Psychological Assessment	N/A	X			

Throughout each block, instructors provide feedback on what they observe. During graded practical exercises, instructors may be watching a student one-on-one, while other larger exercises such as the MASSCAL and Medical PT require instructors to observe multiple students at once. Typically, instructors provide daily feedback in a group setting at the end of the day. However, a student may request on-demand feedback. If there are safety hazards or issues an instructor would like to address immediately, they may interject in the scenario. Feedback is often communicated by referring to the advisor attributes. In Block 4, the presence or absence of these attributes is directly recorded. As provided in the CATC Standards and Overview (U.S Department of the Army, 2022, p. 3), the advisor attributes and their definitions are as follows:

1. **Disciplined—**An advisor must have self-control and upright character; Advisors must have a strong moral compass choosing the hard right over the easy wrong in the face of adversity and minimal oversight.
2. **Mature—**An advisor must be able to control emotions and actions in order to behave in a professional manner when dealing with others during stressful, complex, and uncertain situations.
3. **Sound Judgment—**An advisor must have the capacity to assess complex situations or circumstances and draw sound conclusions uninfluenced by emotions or personal prejudices.
4. **Initiative—**An advisor must display the self-motivation to act or take charge.
5. **Cool Under Pressure—**An advisor must display control, balance, and stability in all situations.
6. **Tolerance for Ambiguity—**An advisor must be comfortable operating with uncertainty, unpredictability, and limited guidance in various tough environments.
7. **Open-Minded—**An advisor must be able to see beyond their perspective to visualize a situation, regardless of personal biases, in order to succeed or fail.
8. **Empathetic—**An advisor must embody the ability to identify, comprehend, and relate to the indigenous partner force and other stakeholders.
9. **Situationally Aware—**An advisor must understand all relevant situational variables to assess how they affect the current and future environment.
10. **Patient—**An advisor must remain focused on long-term objectives when dealing with issues, setbacks, or obstacles to mission success.
11. **Morally Straight—**An advisor must display honesty and good character continuously while advising partnered forces regardless of the situation.

The job of CATC instructors is complex. Instructors rely on paper-based tools, and the basic course structure involving the four blocks of training can present challenges for the continuity of instruction. To assist them in their work, this research aimed to investigate the usefulness of a digital application to support instructors, specifically with regard to activities related to assessment and feedback.

Before developing software for a functional digital tool, one first step is to create prototypes of the design and iterate on those (Dam & Siang, 2020). A prototype is a preliminary model or archetype used to demonstrate or test the user experience and various task flows. It is a physical representation of the solution. Prototypes are a means to test and validate ideas before sharing them with stakeholders and passing the final designs to engineering teams for the

development process. Prototypes can range widely in terms of fidelity, with lower fidelity prototypes typically being less expensive and time consuming to create, making them the chosen first step in this design process. Given that the research team began with limited knowledge of the course and the instructor tasks, emphasis was placed on developing hand drawn representations of the tool design and clickable computer-generated pictures and videos. This allowed the research team to focus on the instructor workflow, gathering of tool requirements, and making design changes easily in response to stakeholder feedback.

Method

The research team conducted two sets of interviews to gain a basic understanding of (a) how the course was organized and managed, (b) what individual and team assessment occurred throughout the course, (c) how feedback was captured and presented to students, and (d) instructor challenges related to capturing data regarding student performance. This was followed by two weeks of training observations and additional feedback from instructors.

Interview Participants and Procedure

The first set of interviews consisted of five 90-minute sessions on the phone, each with a single instructor and two researchers. Researchers interviewed one instructor for Blocks 1, 2, and 3, and two instructors for Block 4 (FTX). These interviews were meant to gain an understanding of the course. Specifically, questions were asked about the nature of each block; the students in the course; instructor experience; when, where, and how assessment occurred throughout the course; and any current challenges related to assessment, feedback, and course administration that a digital tool might help mitigate. This helped researchers to better understand the instructor workflow and preliminary requirements for a digital tool.

The second set of interviews consisted of four 90-minute sessions using Microsoft Teams, each with a single instructor and two researchers. Researchers interviewed one instructor each for Blocks 1 and 2, and two instructors for Block 4[1]. These interviews primarily focused on a related research effort to develop team observer-based assessments to be placed within the digital tool (Orvis et al., 2022). Throughout this set of interviews, instructors talked about the events within each block and how they related to the items. Although the data collected was focused on the development of the team assessments, it also helped the researchers better understand the course context and how instructors might want to use a digital tool.

FTX Observations and Interviews

The research team spent two weeks on site observing the Block 4 FTX. This included observation of eight training days. The first few days were spent rotating between MAT teams and the BAT to better understand variation in team performance. After the first few days, the researchers remained with the same MAT to observe how a single team was performing and progressing throughout the FTX. The research team observed the teams performing both internal

[1] During the first set of interviews, the researchers determined that Block 3 did not include opportunities for teamwork, as the focus is on individual advisor tracks. Because the focus of this research is on developing a tool for team-based assessment, instructors from Block 3 were not included in the second round of interviews.

(planning and syncs) and external (KLEs) team functions. The research team also sat in on AARs (After Action Reviews) conducted at the end of each day and observed multiple instructors conducting them in their own unique styles.

There were two OCs for each MAT (eight total) and four OCs for the BAT. Two instructors requested not to be interviewed or observed. The team also met with course leadership and the MATA psychologist to discuss ideas for the tool concept.

After four days of observation, the research team began developing preliminary prototypes (hand drawings and computer-generated drawings) for an iPad tool concept and a second Apple Watch tool concept that would serve as complementary applications. One of the researchers conducted cognitive walkthroughs with OCs during their downtime to elicit feedback on the prototypes. The cognitive walkthroughs consisted of asking the cadre questions related to how they would utilize the proposed tool. Overall, the feedback from OCs was positive. The workflow resonated with OCs, and they expressed excitement at the prospect of a tool that connects them with other groups and demands very little attention. During these initial cognitive walkthroughs, we also identified new user requirements that would be represented in the subsequent prototypes. These features included things like free notation, and image and video upload.

While the researchers primarily observed the Block 4 FTX, they also observed the MASSCAL event in Block 2. Multiple teams conduct this event one after another in a staggered fashion, with an AAR after the scenario for one team overlapping with the planning portion of the next team. The researchers split up for this observation so that two researchers were able to observe the AAR and one researcher was able to observe the planning portion for the next team.

Results

During the interviews and observations, instructors indicated that a digital tool would be beneficial. As anticipated, instructors were relying on paper-based products for their assessment, feedback, and administrative activities. They also were keeping some of the written information in large tri-fold binders that were carried around in milk crates, which were bulky and hard to use. The following section describes qualitative data which informed the development of the digital tool concept.

Instructor Tool Requirements

Throughout the interviews and on-site observation, close attention was paid to specific challenges mentioned by OCs and observed in the course. Capturing challenges and designing a tool to address those is an important component of user adoption. Those challenges were then translated into requirements for the prototype design. One of the researchers reviewed the notes and developed a list of requirements, then reviewed the list with the two other researchers who led the interviews.

Ensure Note Taking is Efficient, Easy, and Useful

First and foremost, the high demands placed on instructors make it critical to have an efficient way of capturing notes so they can record any information they need to provide feedback to students and teams. One instructor mentioned they can be observing 12 to 16 students at one time. Traditionally, instructors take notes on their personal devices or within their notebooks, and then debrief the students at the end of the day. This method is great for the ability to capture notes on the spot, but it does not allow for archiving notes to view trends over time. This typical method of taking notes highlights the requirement for a readily accessible tool that allows for easy-to-capture notes while allowing instructors to review previous notes for the purposes of debriefs and counseling.

Improve Speed of Data Entry Through Quick Access Menus

Opportunities for improved efficiencies were mentioned by three instructors in interviews. For example, instructors noted they often observe recurring issues with the students and teams. To help reduce instructor burden of repeatedly entering the same feedback, a digital tool could include preloaded dropdowns for instructors to select commonly observed behaviors.

Improve Efficiency in Data Entry

The current process of scoring tests and assessments can be improved. As it stands, instructors use paper-and-pencil products to score assessments and then enter this information separately in a digital gradebook. One interviewee mentioned a gradebook that is integrated with digital assessments would help reduce time instructors spend grading and entering scores.

Replace Paper with Electronic Records

Currently, instructors are required to keep handwritten notes in folders. Each student has a designated folder and the folders for the entire class are kept in an unsecure filing system (i.e., milk crate) that is passed between blocks. There may be a verbal handoff between instructors from different blocks, but this does not always happen. Also, because the folders are not commonly co-located where the course activities are taking place, there is a lag between when the performance is observed and when it can be captured formally. As a result, the folders are often missing information or have limited notes. When there are notes, they are handwritten, and instructors sometimes have difficulty reading them. Four interviewees mentioned an electronic tool would be an improvement. One interviewee mentioned the accountability a digital tool can offer would be helpful to ensure information is being captured by earlier blocks.

Support Transfer of Information Between OCs

For Block 4, there are two OCs assigned to each team: a primary and an alternate. These OCs might have to fill in for one another for a short amount of time or an entire day. Because they are responsible for observing the same team, they need to be able to jump in where the other instructor left off and maintain situational awareness of what a team has done as well as what they are planning to accomplish. Storing notes in notebooks and on personal devices does not easily allow for the transfer of information between instructors responsible for the same group of

students. Similarly, instructors are assigned to a specific block of training. An instructor assigned to Block 3 will only observe a student's performance during that block, with no easy way of knowing what counseling may have occurred in earlier blocks of training. Due to the limited opportunities to observe students and teams over time, it is difficult to know if a student is regressing or progressing in terms of their individual performance. Three interviewees mentioned there are issues with the continuity of the training between blocks. It is also challenging to know how a team is progressing and building cohesion. It is important to have a way of transferring information between blocks so that instructors from different blocks can pick up where another instructor left off.

Instructor Tool Concept

Two complementary prototypes were developed on site during the FTX observations: an Apple Watch application (Figure 1) and an iPad application (Figure 2). Both prototypes focused on depicting instructor assessment activities. The Apple Watch images in Figure 1 depict a process for recording go/no-go ratings for individual task performance and comments for student roles within a team. A product of this design would enable an instructor to quickly rate the student, record a comment directly into their watch, and save their rating to move on to the next student. It also allows for haptic notification of scenario events that may need to be observed and rated.

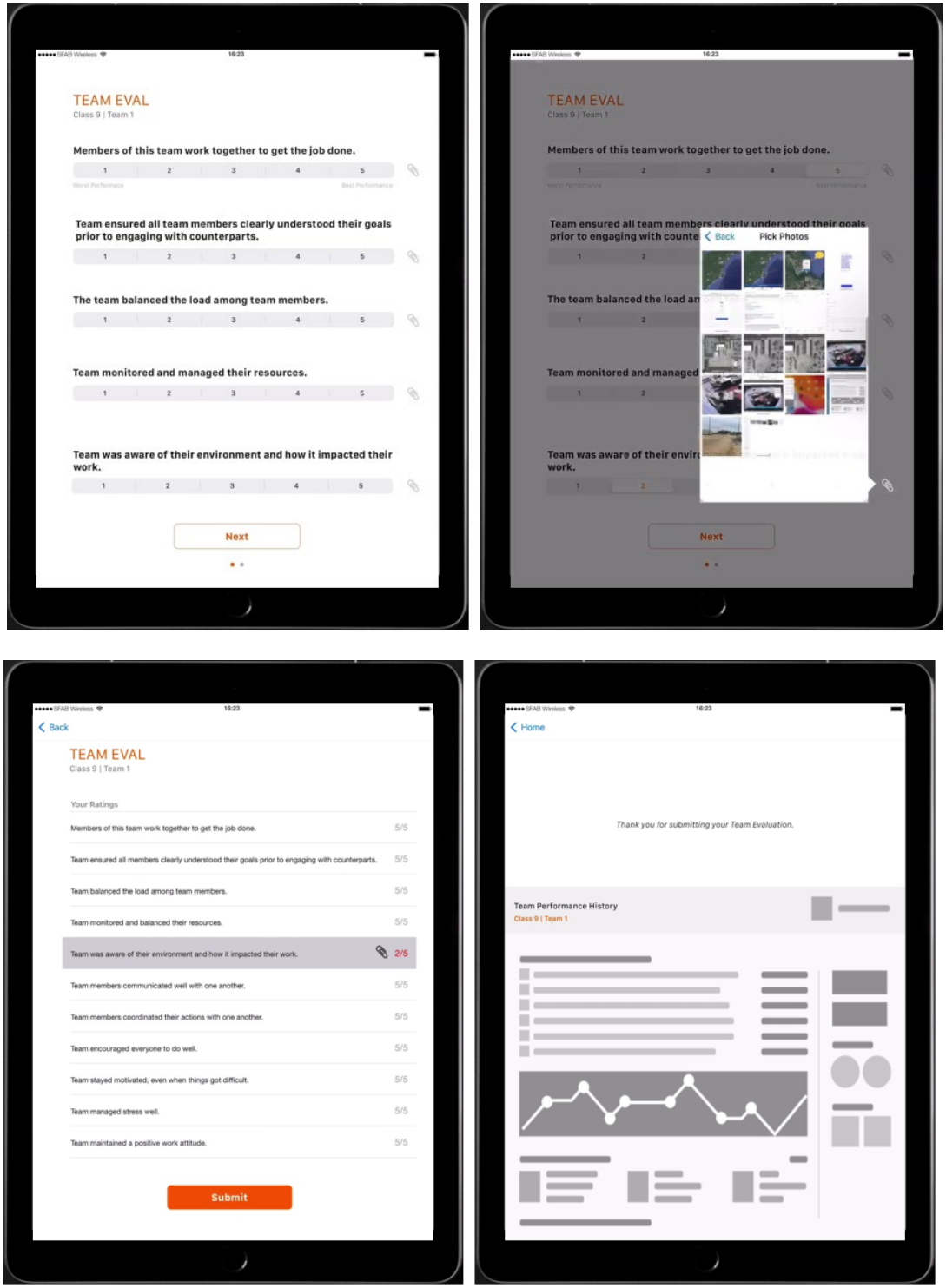
Figure 1

Individual Assessment Prototype

Figure 2 illustrates a process for completing a team assessment survey on an iPad. Using a numeric response scale, instructors rate each item. They also have the option to attach a photo to a specific rating. There is a review screen for quality assurance before submitting. After submitting the ratings, instructors are notified that their assessment was submitted and shown data visualizations of trends from their assessment.

Figure 2

Team Assessment Prototype



Following the on-site observations, the research team aimed to continue developing the tool concept. Researchers utilized the information gained during the interviews and observations to continue iterating on the tool design. A concept map and associated wireframes were developed to provide a broader description of the tool concept and how it would work. The term wireframe refers to a simplified sketch of the important information on a page. Wireframes help establish relationships between various pages while specifically focusing on space allocation and prioritization of content, functionalities available, and intended behaviors. Wireframes are intentionally void of styling, color, and graphics. They can be thought of like the blueprints of a house—providing the foundational structure of the product. Wireframes are a good way to walk stakeholders through the structure of the design without getting distracted by colors and images. A concept map describes the overall flow and linkages of the tool pages and functions.

The wireframes and concept map below were created to map out the functionality of the tool and ensure it addresses instructor challenges. Mapping out this functionality early saves time in future development stages. Ideally, the wireframes would be used in conversations with stakeholders to gather feedback and develop higher-fidelity prototypes to test more thoroughly. In this case, the research team presented the wireframes and concept map to MATA leadership at a later stage. The concept was well received, and they felt such a tool conceptually made sense and would be valuable.

The concept map in Figure 3 depicts the relationships of pages that will be described below. Each arrow represents a link to the pages that can be accessed from the origin point. The starting point of the concept map is on the far left at the sign-in page. The dotted line represents a one-way relationship that will only be used the first time an instructor is using a tool (and until they log out).

Figure 3

Concept Map

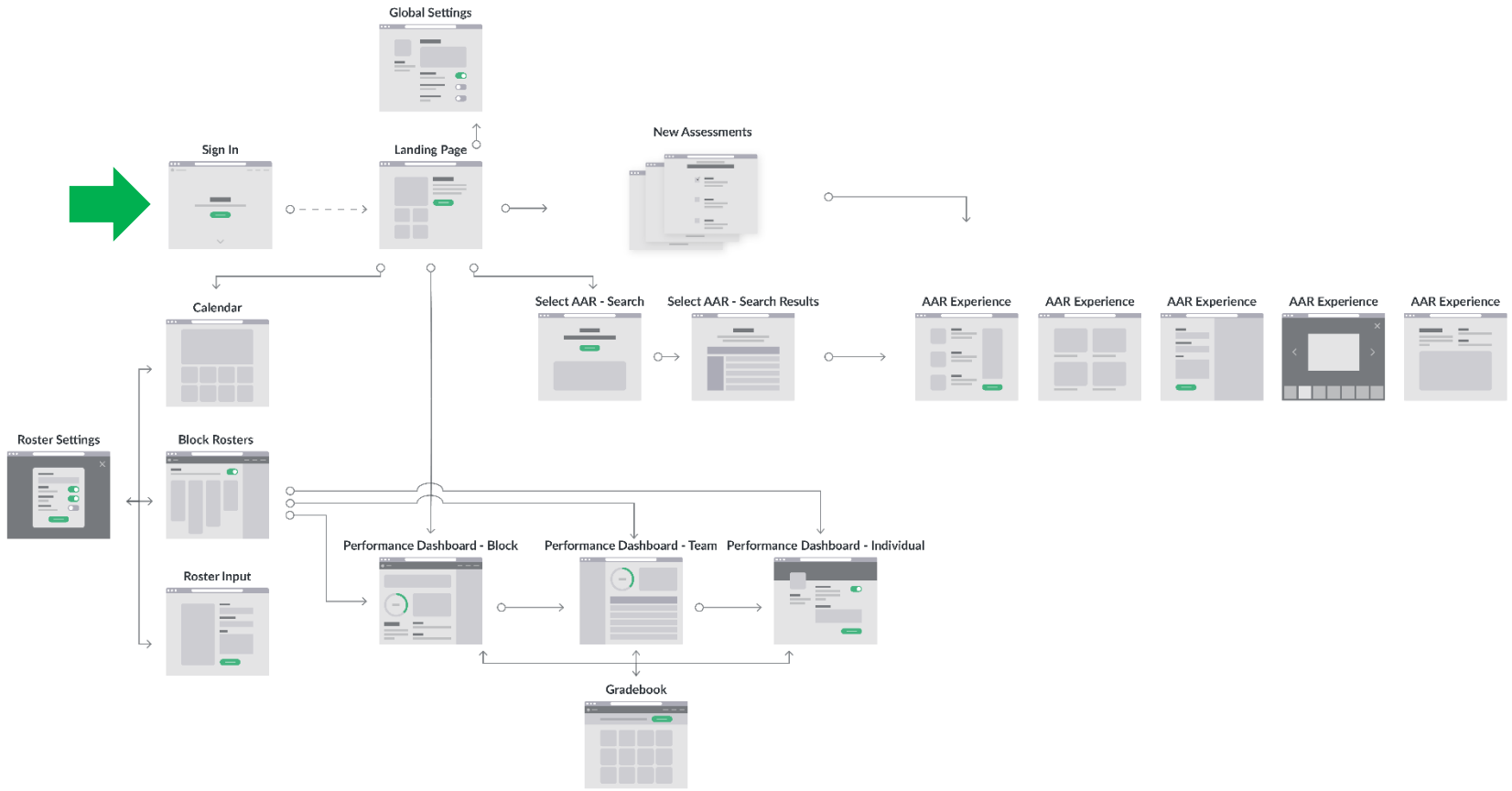
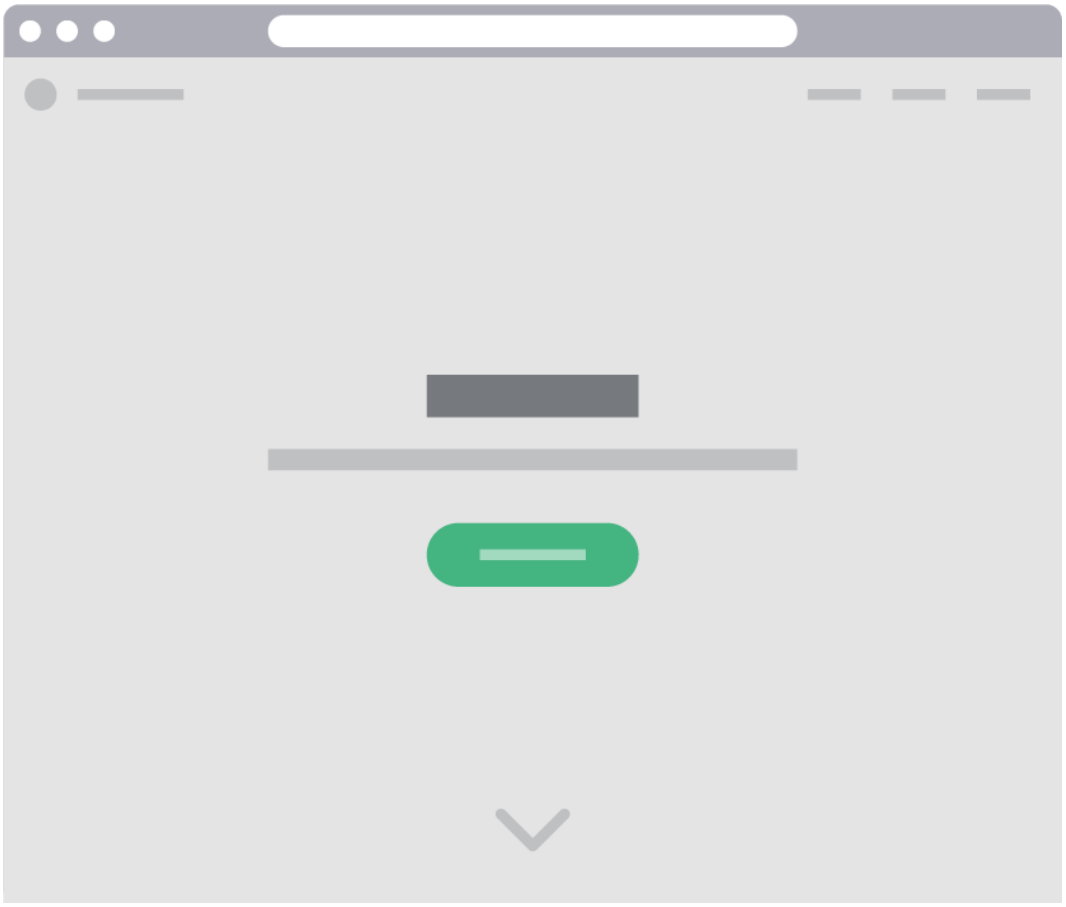


Figure 4

Sign-In Page



The sign-in page is the first screen a user will come to when they are accessing the tool. Unique login credentials allow for a personal experience for each instructor. Unique logins allow for permissions to be tied to individuals so that instructors are only accessing what they are responsible for. They also allow for inputs such as notes and assessments to be tied to an individual user, which can then be automatically tied to their assigned team. Tying inputs to individual users also can create an audit trail so that course administrators may see who entered what information. This page allows for quick sign-in and only requires a user to sign in once, remaining logged in until they sign themselves out. The login credentials used on the sign-in page should be easy to remember and unique for each instructor.

Figure 5

Landing Page

The landing page will be the first screen an instructor accesses once they are signed in. The purpose of this page is to provide quick and easy access to functions instructors need to access often, such as assessments or practical exercises, or the specific training day. Instructors will want to enter the tool and easily access the content they need, so the links on this page should be organized in a way that makes intuitive sense. Because instructors are juggling multiple responsibilities at once, they will want to capture assessments quickly, so they do not forget things while they are navigating to the right page. They may also need reminders to fill out certain assessments, so notifications will appear on this page. Sometimes, an instructor may need to access resources outside of the tool. In this case, after exiting the tool, the landing page will serve as a place that the instructor can easily pick up where they left off to complete their assessments for both teams and respective team members.

Figure 6

Global Settings/Administration

The global settings/administration page is a place where the Course Manager/Course Administrator can go to perform administrative functions to help the course run smoothly. This page will allow the Course Manager/Course Administrator to customize the system so that it fits the needs of the course and the instructors. These may include things like managing class settings, configuring teams, assigning instructors, turning surveys on and off, and linking surveys to training days to notify instructors to complete them.

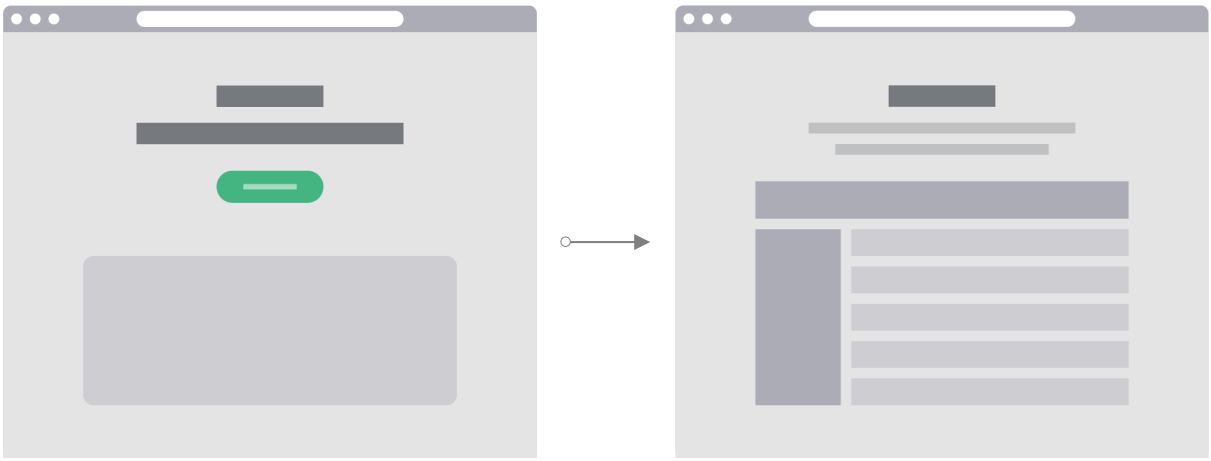
Figure 7

Team/Individual Assessment

Assessments will enable raters to capture observations of students, either as a team or as an individual. This page will allow instructors to input structured information to refer to later, whether during group AARs or individual counseling. Instructors will want to be able to easily interpret how the behavior they are observing relates to the specific assessment items. Depending on the type of assessment, response options may utilize Likert scales, checklist items, drop downs, or open text. When possible, response options will be preloaded to limit the time an instructor must have their head down typing information. From this page, instructors will be able to move directly into an AAR to create a seamless transition between assessments completed at the end of the day and debriefs.

Figure 8

Select AAR



The purpose of the select AAR pages is to prepare for the AAR by determining which information the instructor would like to refer to and highlight. Instructors may want to focus on a specific assessment they completed, an entire day, or performance across multiple days. In preparing for an AAR, the instructor might notice input errors, such as typos or completing an assessment about the wrong individual, that need to be corrected. When preparing the content to show during an AAR, instructors will have the ability to edit important details so that their feedback is clear and representative of student performance. The first screen will be accessed from the landing page, which is then linked to the second page, and subsequently to the AAR experience page.

Figure 9

AAR Experience

Note. The figure shows various presentations of information for use in an AAR.

MATA instructors use diverse approaches when conducting AARs. The AAR experience pages will be flexible to accommodate instructors' preferences. The visualizations will depend on what the instructor wants to highlight and will need to seamlessly transition across different displays. During AARs, instructors want to be able to reference the notes and assessments they recorded throughout the day to be able to provide concrete examples to students. Depending on the team and their performance, the instructor may want to structure their AAR to focus on specific individuals, or the team as a whole. The select AAR page that precedes the AAR experience will help instructors customize their AARs. These AAR pages will route back to the landing page.

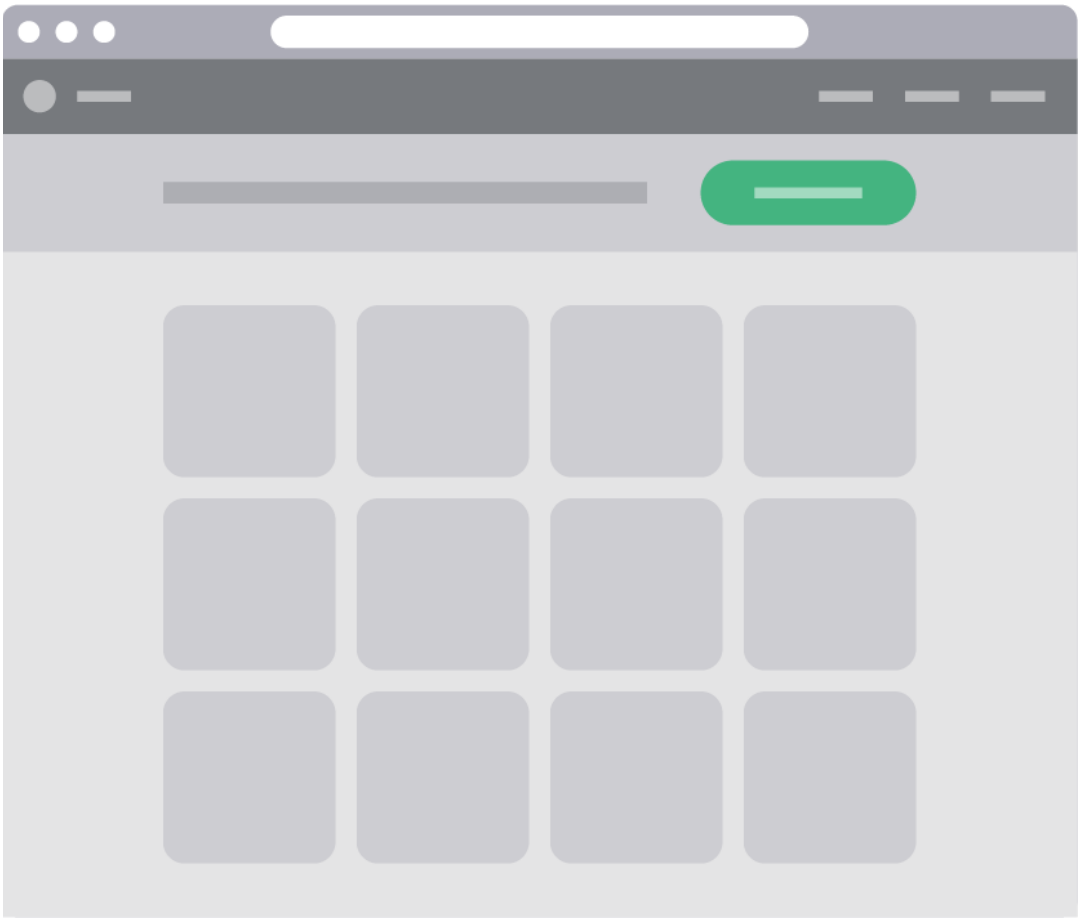
Figure 10

Roster Controls

The roster controls page is similar to the global settings page (Figure 6) but is only for instructors. On this page, the administrative functionality is limited to what instructors need to accomplish within the tool, which involves assigning individuals to positions within their teams. Although rare, individuals in Block 4 are in some cases reassigned to a new position. For example, the Assistant Team Lead may be reassigned as the engineer. This page would allow instructors to manage the students within their team without needing to reach out to the Course Administrator/Course Manager to make the changes.

Figure 11

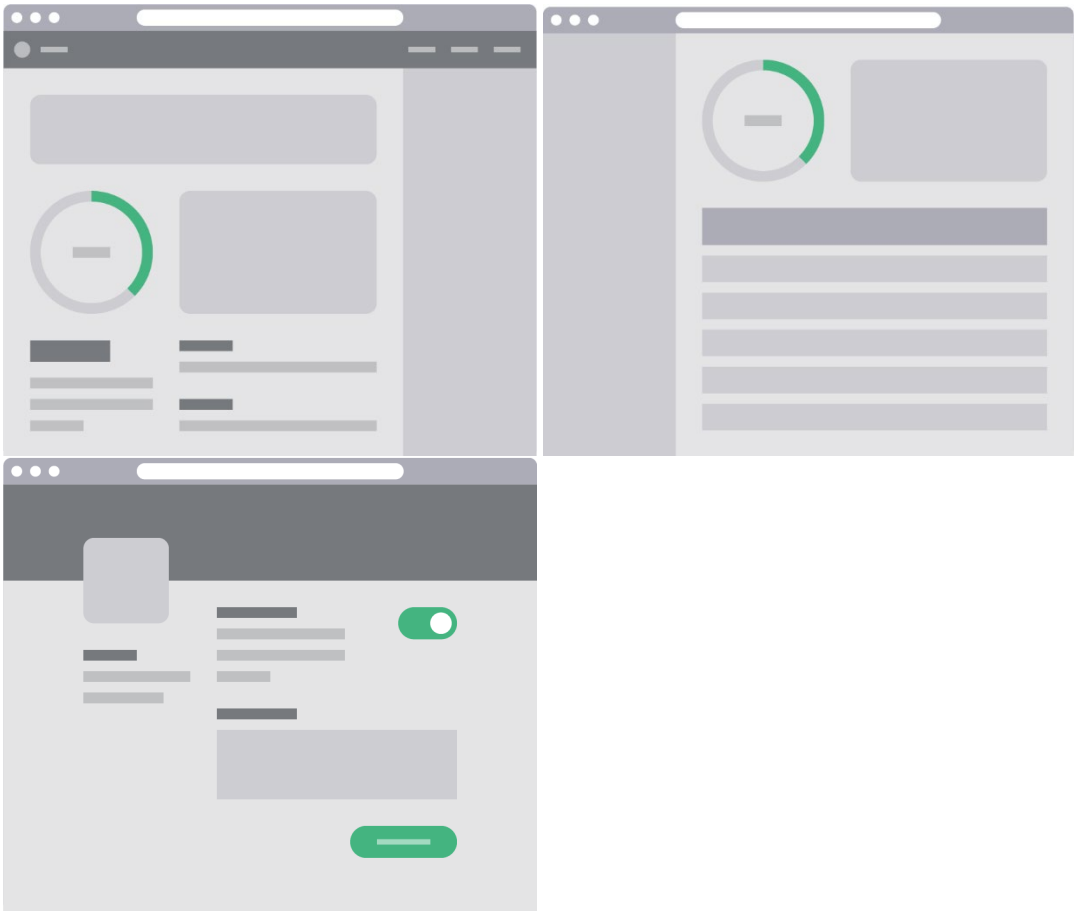
Gradebook



The purpose of the gradebook page is to record and display quantitative and pass/fail grades to written exams, practical exercises, and assessments. Block leads, instructors in charge of a specific block, want an easy way to input and access this information. Ideally, the assessments that instructors record will be aggregated and immediately input into the gradebook without requiring double entry.

Figure 12

Performance Scores/Dashboard



Note. The figure shows various presentations of performance information.

The performance scores/dashboard page provides an in-depth look at a student, team, or class(es) over time. The performance dashboard allows students and instructors to review past performance, trends, and comparisons. During observations, instructors indicated that they would find historical information useful as a means to better understand the context of student behavior. This page will enable instructors to decipher between long-standing issues and unique circumstances. Similarly, course leadership may want to look at a student's comprehensive assessments to determine if an intervention is needed. At the end of each course, students are provided with individual counseling. The performance dashboard will be a useful tool for these end-of-course counseling sessions. Course leadership may also want to look at class-level trend data.

Discussion

The purpose of this research was first to investigate the usefulness of a digital tool which supports MATA instructors in their assessment, feedback, and course administration activities. During interviews with the MATA instructors, it was clear that they thought such a tool would aid them in their job. As such, the majority of this report describes the development of a digital tool concept for use at the MATA that meets identified instructional needs. The designed tool would digitize the existing assessment components of the course, while enhancing the current processes by using technology to improve feedback and identify course improvements.

This research is a strong foundation for the subsequent design and development of a tool with input from its ultimate users. However, the current design is not a perfect solution, as it is limited by the amount of feedback gathered from instructors on the wireframes. Although the wireframes and concept map were helpful in describing the overall functionality of the tool, the design team was not able to codesign exact features and functions in the form of a more descriptive prototype. Future research should utilize the results of the current effort to engage with users and iterate on the design to develop more high-fidelity prototypes. This includes working with project users and stakeholders to discover unmet needs and explore opportunities to make substantive improvements in how performance is understood and captured at the MATA. After more iterations of the design and development of the tool, usability studies should be conducted based on field tests to ensure the tool is meeting instructor needs. While some of the challenges that the tool is designed to address may be unique to instructors at the MATA, it is reasonable to assume that there are other courses that might benefit from such a tool.

References

Dam, R., & Siang, T. (2020). *Design thinking: Get started with prototyping*. Interaction Design Foundation: Retrieved September 2022, from https://www.interaction-design.org/literature/article/design-thinking-get-started-with-prototyping#:~:text=A%20prototype%20is%20a%20simple,or%20possible%20changes%20in%20direction.

Orvis, K. L., Brown, J. E., & Fleming, A. C. (2022). *Observer-based team measures for the Military Advisor Training Academy* (Research Note 2023-01). U.S. Army Research Institute for the Behavioral and Social Sciences.

U.S. Department of the Army. (2022, June). *Combat Advisor Training Course Standards and Overview (CASO).* Military Advisor Training Academy (MATA) https://www.benning.army.mil/armor/316thCav/MATA/Content/pdf/CASO%20as%2029%20June%2022.pdf.