Flight Instructor Standardization Training: Purdue Operations Manual

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Project Background

Purdue University offers a bachelor's degree in professional flight that provides a larger perspective of the aviation industry. The degree is given through the School of Aviation and Transportation Technology's Flight Program. Aside from learning from Professors with significant industry experience, the flight program provides an opportunity for students with a Certified Flight Instructor certificate to join the instructing staff. To ensure a high level of training and experience, the instructing staff undergo various training throughout their employment at Purdue.

One of these trainings include the Flight Instructor Standardization Training. Standardization is an annual training that must be conducted by the flight program and taken by all its instructional staff, as prescribed by the Federal Aviation Administration regulations.

Due to the current world environment and increases in demand, the standardization training has been moved to an online delivery format. To ensure that the quality and learning of the instructional staff is the same as when done in-person, the standardization training must be uniquely designed to meet our learners needs. For this reason, an informal evaluation was conducted to determine how the online training met the instructional goals. From this evaluation, it was determined that a revision to the training needed to be done.

The internship focuses on revising a section of the standardization training. It is expected that the POM section of the training be revised to better match the instructional goals and ensure learning and transfer of learning in the instructional staff.

Subject

This self-paced e-learning module will be designed in Brightspace for the Purdue Operations Manual (POM) Training. This section covers the Flight Program's POM and instructional staff are expected to use this training session to become more familiar with the POM. The POM includes standard guidelines on safety, operations and procedures, policies and guidelines, stage check and preflight procedures, crosswind trainer training, and others. The flight instructional staff are expected to be aware of all the standards and guidelines, as well as in some cases be able to practice those procedures while instructing. Thus, this module will be designed for declarative retention as well as procedural skill transfer.

Learning Context

The training needs to be a self-paced online training module compatible with Brightspace with a summative assessment and needs to include a job aid for instructional staff.

An online training module would allow flight instructional staff to take the training anytime, anywhere at their own pace and comfort. Learners have access to devices and internet and will be able to access Brightspace using their Purdue accounts. The flight instructional staff will be assigned a month's time to finish the complete online flight instructor training of which

POM is one section. The training will be modular which will allow the flight instructional staff to take it in the order that they deem fit for themselves.
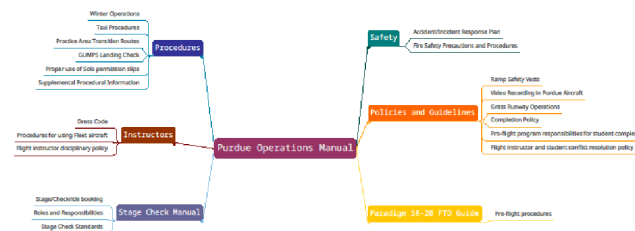
Scope

This e-learning module would be designed to be a standalone self-paced section in a course hosted on Brightspace. The features would be designed to suit the needs of the client and the learners:

- Asynchronous and for a solo learner making it flexible for the flight instructional staff to take it anytime, anywhere at their convenience.
- Modular in format – flight instructional staff can take the Brightspace course one module at a time and return to an incomplete module allowing them to decide their own learning pace and manage their time better.

Module Scope

The instructional content of the e-learning module will cover basic procedures, policies, and protocols from the Purdue Operations Manual. The embedded content map below demonstrates the teaching content including the sub-modules (double click map to open in new tab in full size):

Content Map

Project Scope

The project was carried out using rapid prototyping as an ID model. The stages of design and development involving the steps and deliverables are as given in Tables 1 and 2. The project allowed for formal intermediate client feedback and formative evaluation (Beta Testing) before the delivery of the final product. A weekly meeting was scheduled with the supervisor (Chief Flight Instructor) for ongoing communication and feedback on the progress of the project. The

supervisor reviewed the progress of the project at several stages including learning objectives, content and assessment plan, prototype review, instructional content review.

Table 1

Design and Development Stages

Task	Start	End
Identify and finalize content in the instructional design module – Define Learning Objectives	14-May	24-May
Define Content and Assessment Plan	24-May	28-May
Create prototypes of new pedagogical content proposed	28-May	7-June
Receive feedback on Prototypes from Client	7-June	-
Create Assessment	8-June	14- June
Receive first level feedback from Client and initiate alpha testing of assessment	14-June	-
Create full version of the final product: Content + Assessment	15-June	10-July
Beta testing of the final product	10-July	16-July
Incorporate feedback from the Beta Testing	16-July	5-Aug
Digital Prototype and Final Report	6-Aug	7-Aug

Table 2

Deliverables to the Client

Task	Start	End
Prototype Review: Prototype Assessments + Content map	28-May	7-Jun
Alpha Testing: Assessments + Module structure (Review by master instructors (who conducted face to face trainings earlier)	14-Jun	17-Jun
Beta version: Modifications from alpha feedback + final content and assessments (Testing by flight instructors – 7 learners)	5-July	16-July
Final functional online course module	16-July	5-Aug

Front End Analysis

Target Learners

The target learners of this e-learning module are flight instructional staff at the School of Aviation and Transportation Technology's flight program. The flight instructional staff generally have a mix of returning instructors who have been teaching previously and new flight instructors who are newly joining the flight instructional staff. Both, returning and new flight instructors, have a 'Certified Flight Instructor' certificate. As such, they are aware of several flight procedures and standards specified in the POM module since they learnt those in their flight training. This standardization training is meant for both these categories of learners as they are required to now teach their students and implement the necessary procedures within the policy guidelines. Thus, the learning content in the POM module consists of a mix of prior knowledge and new knowledge for the learners.

Learning Objectives

The learning objectives were developed based on the sub-modules of the POM and inputs received from the Client on learners' prior knowledge, what learners struggle to do, and what needs to be assessed. The client input on needs' assessment can be accessed here: Client Input.

The learning objectives developed from the client input are in this embedded document (please double click on the document to view).

Learning Objectives

Purdue Operations Manual

Safety

Accident/Incident Response Plan
- Flight instructors will be able to describe the steps involved in responding to an emergency
- Flight instructors will be able to recall where to find contact information of key personnel in case of emergency

Fire Safety Precautions and Procedures
- Flight instructional staff will be able to state how to locate fire extinguishers in case of fire in an aircraft or facilities

Policies and Guidelines

Ramp Safety Vests
- Flight instructional staff will be able to indicate when ramp safety vests are required to be worn

Video Recording in Purdue Aircraft
- Flight instructional staff will be able to identify when video recording is/is not permitted in Purdue Aircrafts

Grass Runway Operations
- Flight instructional staff will be able to identify which airports are approved for grass runway operations
- Flight instructional staff will be able to explain the approval process for operating on grass runways

Completion Policy
- Flight instructional staff will be able to demonstrate a broad level awareness of the completion policy

Pro-flight program responsibilities for student completion
- Flight instructional staff will be able to state instructor responsibilities in pro-flight program for student completion

Flight instructor and student conflict resolution policy
- Flight instructional staff will be able to recall the procedures involved in instructor-student conflict resolution
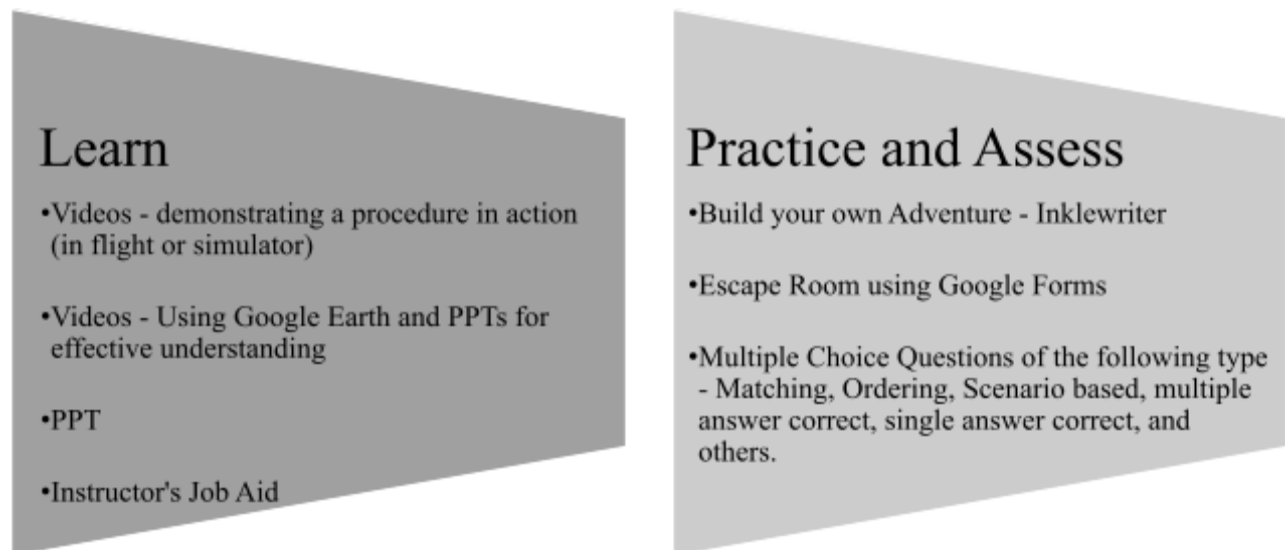
Intended Instruction and Proposed Assessment Plan

  The instruction has been designed to have activities and learning materials based on the defined sub-modules. The base content was received from the client in the form of the POM module booklet. This content was re-designed into activities and instruction as given in Figure 1.

  Since this course is intended for familiarization with declarative and procedural knowledge that the learners should be able to transfer to real scenarios, the assessment focuses on scenario-based decision making, gamified adventure experience, and gamified escape room experience that requires them to apply the learnt content. Learning content has been re-designed into 10-min videos and PPT presentations with voice over to ease the process of having to read the 200-page POM and make it more engaging.

Figure 1
Learn-Practice-Assess activities

Learn

- Videos - demonstrating a procedure in action (in flight or simulator)

- Videos - Using Google Earth and PPTs for effective understanding

- PPT

- Instructor's Job Aid

Practice and Assess

- Build your own Adventure - Inklewriter

- Escape Room using Google Forms

- Multiple Choice Questions of the following type - Matching, Ordering, Scenario based, multiple answer correct, single answer correct, and others.

  The practice and assessment activities are mapped to the learning objectives allowing learners to achieve the objectives. They have been created in the form of quizzes in Brightspace. The quizzes test the learners' ability to transfer the expected knowledge as required by the learning objectives. The quizzes were primarily meant to be summative assessments, however, extensive feedback from learners during beta testing revealed that the primary aim of the training was not memorization of content but the ability to know where to find the relevant content and apply it in regular teaching practice– the quizzes were thus changed to open book quizzes to help learners further familiarize themselves with the content.

Proposed Technologies/Delivery Method

The development of this module required the use of a variety of technology tools to create the content and assessments. The details of the technologies used are given in Table 3.

Table 3

Technology Used for Design and Development

Activity	Platforms/Technology Tools	IDer comments
Videos – demonstrating a procedure in action (in flight or on simulator)	A video camera recording followed by text editing	Done by Purdue Flight Operations team
Videos – with voice over	Microsoft PowerPoint with Screencastify	Voiceover given by Instructional Designer.
PPT	Microsoft PowerPoint	
Instructor's Job Aid	Microsoft Publisher	
Build your own Adventure	Inklewriter	Assessment
Escape Room Mystery	Google Forms	Assessment
Creation of topic maps and learning objectives	MindMup 2.0 for Google drive	
Hosting the course	Brightspace	

Learners will be added to the course by Purdue Flight Operations approximately a month before their teaching begins in the semester.

Instructional Content

Learning Content

The designed instructional learning content (videos, PPTs, Instructors' Job aid) can be found in this Purdue Box folder: [Content for POM](#)

Practice and Assessment

The assessments POM Quiz 1 (39 questions) and POM Quiz 2 (33 questions) have been created within the Brightspace course. These quizzes have objective questions divided into the six sub-modules of the content (as specified in the content map). The 'Build your own Adventure' in

Inklewriter and 'Escape Rooms' using Google Forms have also been linked as objective questions for ease of access so that the learners may attempt all assessment through Brightspace. The client has been requested to provide temporary access to the Brightspace course for evaluation purposes.

The following assessments can also be accessed independent of the Brightspace course here:

Build your own Adventure: Inklewriter based assessments

Practice Area Transition Routes: https://www.inklewriter.com/stories/64615

Landing GUMPS Check: https://www.inklewriter.com/stories/65060

Preflight Check Procedures: https://www.inklewriter.com/stories/65475

Escape Rooms for Flight Instructors

Incident Response Plan: https://forms.gle/px63i88MriPHGrMt6

Evaluation Feedback and Remediation

Alpha Testing

Two Assistant Chief Flight Instructors at the Purdue Flight Operations agreed to do the alpha testing of the assessments developed for the POM module. They were given access to the Brightspace course and one week to review the assessment. Feedback was collected using a Qualtrics form. The feedback received has been compiled as a report in the below embedded file (please double click to view in full size)

Alpha Testing Report
POM Assessment Feedback
August 6th 2021, 3:36 pm MDT

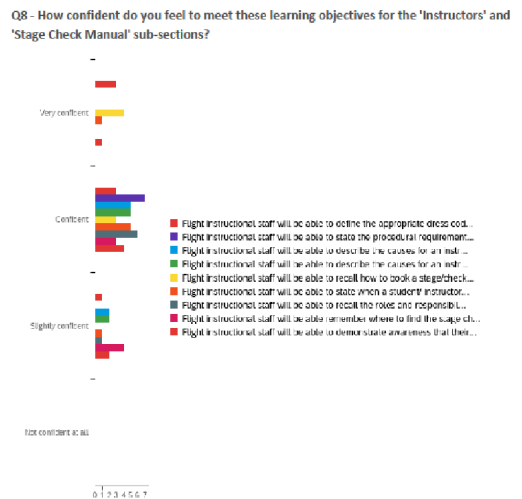Q2 - What's your designation/role at the Purdue Flight Operations?

What's your designation/role at the Purdue Flight Operations?

Assistant Chief Pilot

Assistant Chief Flight Instructor

Beta Testing

Seven returning flight instructors were willing to review the complete course for the beta testing. They were given access to the Brightspace course and 7 days to complete the feedback process. This was in alignment with the expectation that the trainees will be expected to complete the training in a week's time. A different Qualtrics form was shared for the beta testing feedback. They were informed that if they have specific feedback, they were welcome to email the instructional designer or the Chief Flight Instructor with the details. The report of the Qualtrics feedback is compiled as a report in the embedded file below (please double click to view in full size). Several of the reviewing flight instructors provided specific detailed suggestions for modifications and corrections in the form of email and word docs. The summary of this is given in the 'Remediation' section below along with the action taken to make changes to the final course module.

Q8 - How confident do you feel to meet these learning objectives for the 'Instructors' and 'Stage Check Manual' sub-sections?

#	Question	Very confident		Confident		Slightly confident		Not confident at all		Total
1	Flight instructional staff will be able to define the appropriate dress code as an instructor at Purdue Airport for different occasions	42.86%	3	42.86%	3	14.29%	1	0.00%	0	7
2	Flight instructional staff will be able to state the procedural requirements to use/fly a fleet aircraft	0.00%	0	100.00%	7	0.00%	0	0.00%	0	7

Remediation

Based on the feedback received in the alpha and beta testing the instructional designer had a meeting with the client supervisor (Chief Flight Instructor) to determine the changes to be made. Table 4 summarizes what action was taken for each of the feedback received.

Table 4

Evaluation Feedback and Remediation

No.	Feedback/Suggestion	Reasoning/Discussion	Action Taken
1	Although all topics were covered in the material provided reviewing flight instructors struggled to find what they needed		A tabular mapping of content with topics covered was created in Brightspace to guide them to navigate the content.

2	Several learners voted that they preferred reading many of the topics directly from the POM booklet rather than watch the videos or PPTs.	The reviewing flight instructors were contacted to understand if they did not feel the need for video content at all. On further discussion, learners said that having access to the booklet in addition to the videos and PPT content would be more helpful in the understanding. The flexibility of choosing the type of media used depending on their preference is what they were looking for.	A link to the POM booklet was provided in the Brightspace course in addition to the videos and PPTs. In the course description in Brightspace it was noted that students are required to refer to the POM wherever necessary for a comprehensive understanding of the topic.
3	The Inklewriter and Escape room assignments were voted inappropriate for the topic by some reviewers.	The Chief Flight Instructor believed that this may be because all the reviewing flight instructors were returning flight instructors who were highly experienced already. However, it was believed that the new flight instructors will find these assignments helpful to accustom themselves with the policies and guidelines.	These were retained. A possibility of creating two groups of learners within Brightspace was discussed – one for new flight instructors and one for returning flight instructors. The specific assignments can be assigned only to new instructors. This will be done at the time of enrollment of the learners, if required and if deemed necessary.
4	Safety related questions in the quiz were deemed too difficult by learners. In their feedback they mentioned that specifically the fire extinguisher question required recall of exact location which they thought was unnecessary given that directions are marked in the building.	The Chief flight instructor agreed that exact recall is not required however, it would still be important for learners to review and revisit the fire extinguisher schematics so that they are familiar with locating them based on the schematic.	The question wasn't changed; however, the quizzes were made open book since the purpose of the course is to familiarize the learners with the policies and help them locate the right information at the time that they need it.
5	Escape room scenarios: Some learners thought the 1st scenario seemed too hypothetical and non-realistic in the escape room assignment.		This was modified to remove the hypothetical aspects.

6	Escape room scenarios: Scenario 2 had reviews that opined different possible solutions.	On further investigation with their Safety department, the chief flight instructor agreed with the feedback.	This scenario was completely removed from the assignment to avoid confusion. The number of scenarios were thus reduced to 2 from a total of 3.
7	Discrepancies in aircraft lights usage. Reviewers believed the guidelines in their checklist are different from those in the POM	The chief flight instructor clarified that the checklist is more for the practical application of the guidelines based on the real-life scenarios they faced. However, the guidelines in the POM were what the regulations prescribe and must be understood and recalled as given.	The questions were not changed. A note was added in the questions that said that learners should follow regulations as given in the POM
8	Typos were reported in one of the presentation slides		These were fixed.