



The Airman Learning Record and AMC's Learning Services Ecosystem

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Presented on 29 August 2018



Agenda

- Motivation and Principles
- Airman Learning Record (ALR) Concept
- AMC Learning Ecosystem
- Examples
- Implications

Motivation: Operational Performance

“The speed, connectivity, and non-linear nature of the environment in which warfighters must operate fundamentally changes how one must think about objectives and the threats we face.”*

- Nimble, effective learning systems translate into ready airmen -- current environment is frequently anything but
- Training decisions need to be linked to data and mission relevance and tirelessly improved
- Need to move learning measurement from who, what & where to how and why

*Lt Gen (Retired) Allardice and Mr. Topic (2017). Battlefield Geometry in our Digital Age: From Flash to Bang in 22 Milliseconds. *PRISM* Vol 7, No. 2; National Defense University.

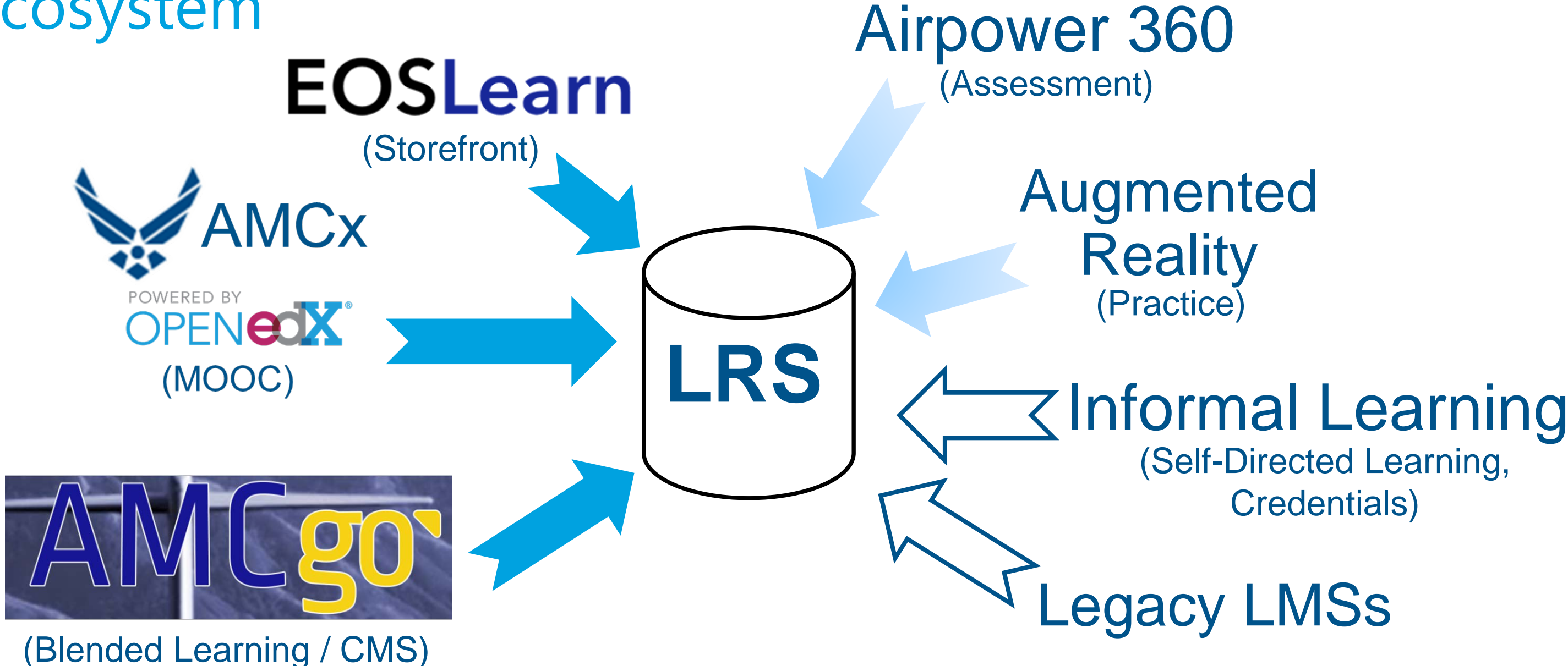
Principles

- Air Force learning environment necessitates analytics tools that are:
 - Cloud Native; mobile first
 - Extensible across use cases without expensive customization
 - Scalable to hundreds of thousands of users
 - Capable of integrating complex, massive data across domains (biosensor, affective, etc.)
 - Non-proprietary
 - Standards-based
 - Interoperable with legacy systems

Airman Learning Record Concept

- Capture learning data from all learning experiences (wherever you can) with total flexibility to capture data at the right level of fidelity/detail
- Instrument and ‘sensorize’ all learning experiences
- Use standards to communicate in a structured way through an open API
- Store them all in an Airman Learning Record Store
- Perform dynamic analytics on that data
- Develop insights and feedback loops to:
 - The learner
 - Learning content owners, producers, designers, & instructors to continuously improve
 - The owners and stewards of learning programs to prioritize investments

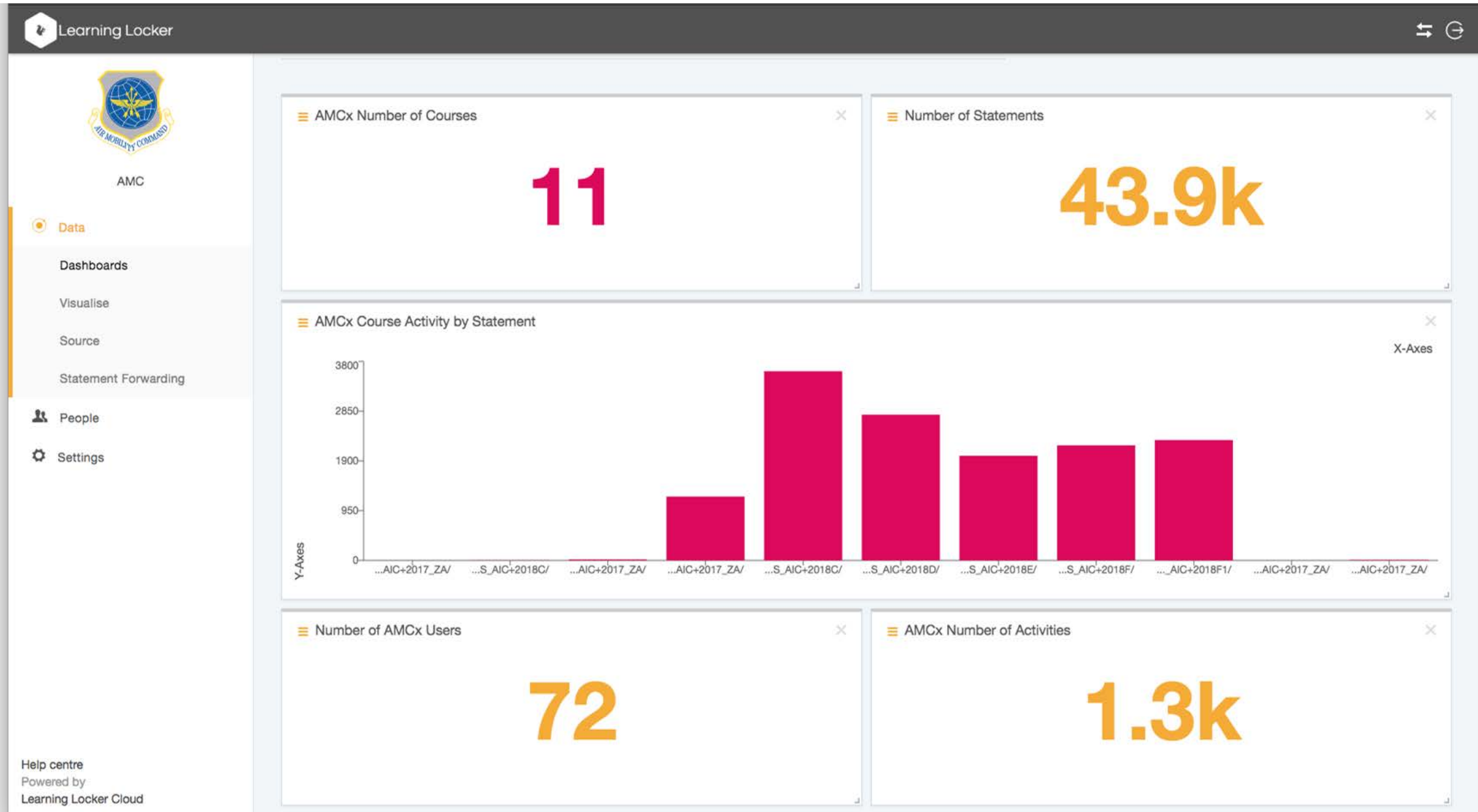
Learning Services Ecosystem



Technology Toolkit

- **AWS**
- **edX**
- **Learning Locker**
- **Drupal**
- **Lime Survey**
- **Others as needed...**

Inside the LRS



Inside the LRS (continued)

The screenshot displays the Learning Locker interface. At the top, the 'Learning Locker' logo is visible. The main content area is titled 'Statements'. On the left, there is a sidebar with 'Statement Forwarding' and options for 'People' and 'Settings'. A search filter is active, showing a dropdown menu with the following options: 'AMCx Production Store (14140 Statements)', 'EOSLearn Production Store (1380 Statements)', 'AMCgo Production Store (28400 Statements)', and 'Add New'. The main area shows a list of activity logs with columns for user, action, resource, and time. A 'Load more' button is located at the bottom of the list.

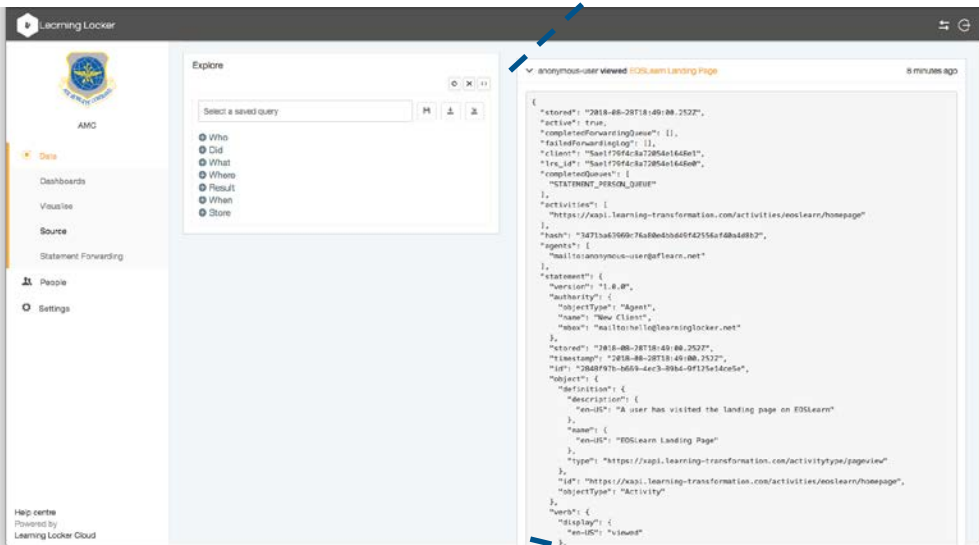
User	Action	Resource	Time
anonymous-user	viewed	EOSLearn Landing Page	7 minutes ago
sguajardo	viewed	EOSLearn Tab - Courses	7 minutes ago
sguajardo	viewed	EOSLearn Tab - EOS About Us	7 minutes ago
sguajardo	viewed	EOSLearn Tab - EOS Products and Services	7 minutes ago
sguajardo	viewed	EOSLearn Tab - EOS About Us	8 minutes ago
sguajardo	viewed	EOSLearn Tab - EOS Products and Services	8 minutes ago
sguajardo	viewed	EOSLearn Tab - EOS Student Resources	8 minutes ago
sguajardo	viewed	EOSLearn Tab - Courses	8 minutes ago
sguajardo	viewed	EOSLearn Landing Page	8 minutes ago
sguajardo	viewed	EOSLearn Landing Page	8 minutes ago

Inside the LRS

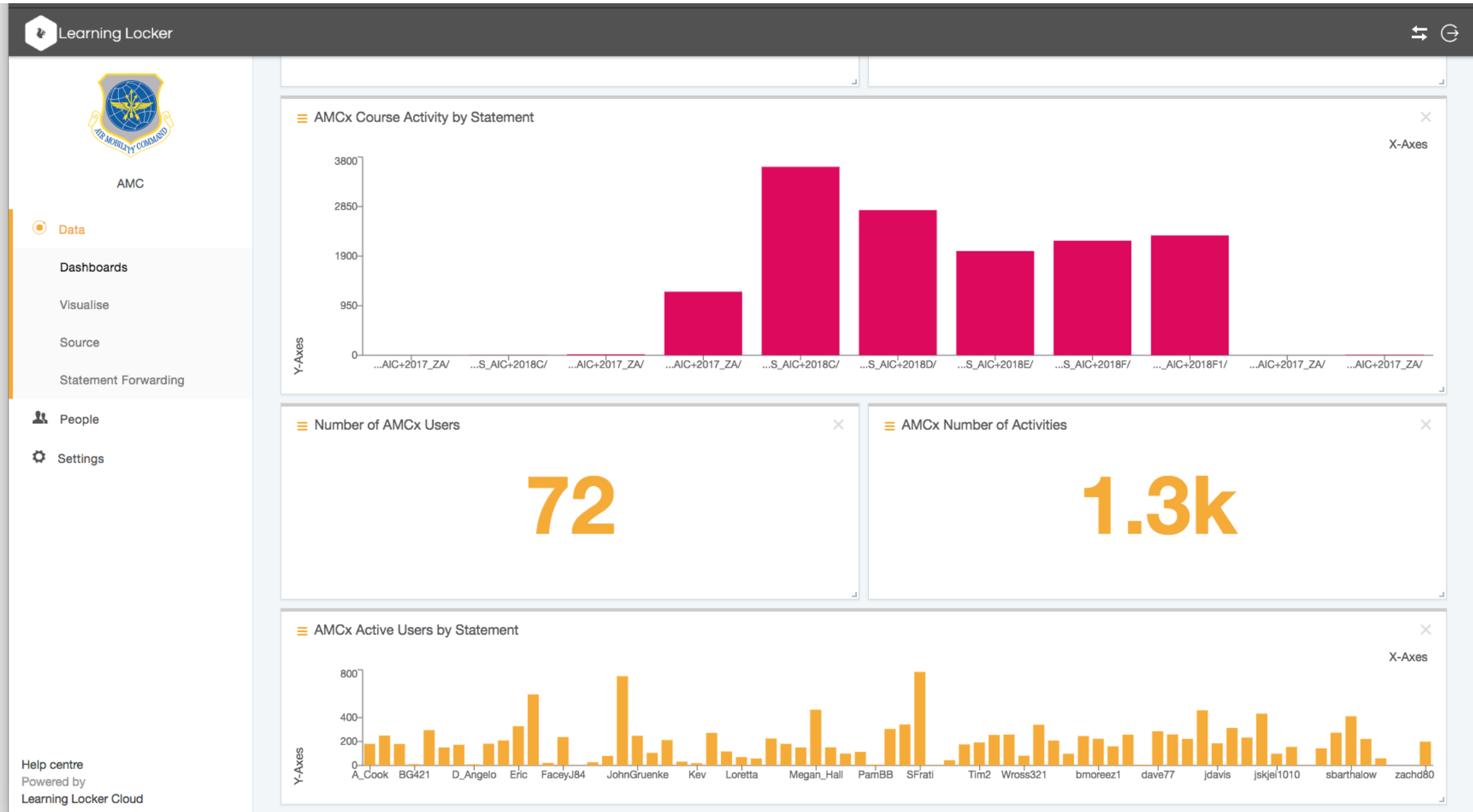
anonymous-user viewed EOSLearn Landing Page

8 minutes ago

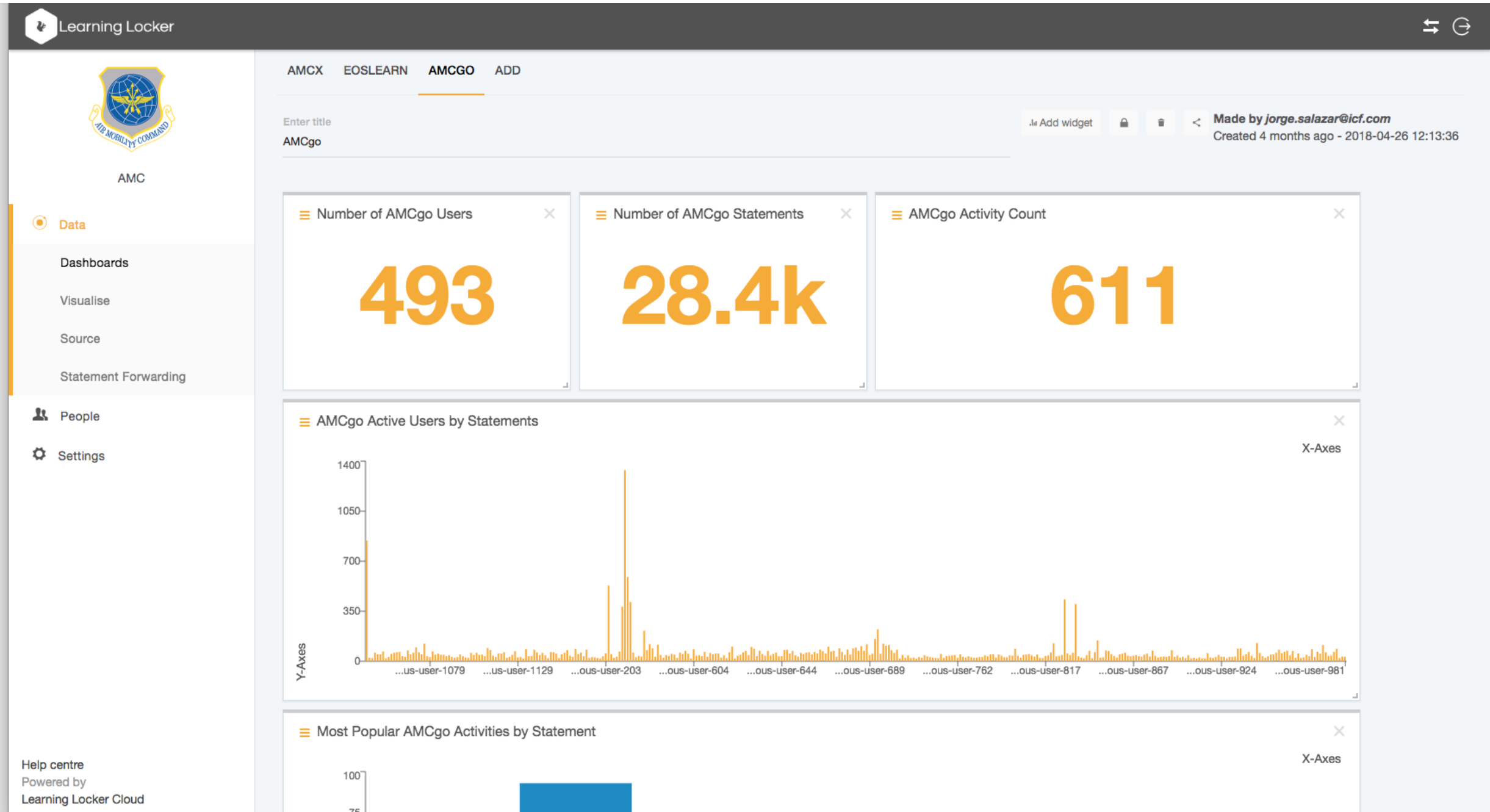
```
{
  "stored": "2018-08-28T18:49:00.252Z",
  "active": true,
  "completedForwardingQueue": [],
  "failedForwardingLog": [],
  "client": "5ae1f79f4c8a72054e1648e1",
  "lrs_id": "5ae1f79f4c8a72054e1648e0",
  "completedQueues": [
    "STATEMENT_PERSON_QUEUE"
  ],
  "activities": [
    "https://xapi.learning-transformation.com/activities/eoslearn/homepage"
  ],
  "hash": "3471ba63969c76a80e4bbd49f42556af40a4d8b2",
  "agents": [
    "mailto:anonymous-user@aflearn.net"
  ],
  "statement": {
    "version": "1.0.0",
    "authority": {
      "objectType": "Agent",
      "name": "New Client",
      "mbox": "mailto:hello@learninglocker.net"
    },
    "stored": "2018-08-28T18:49:00.252Z",
    "timestamp": "2018-08-28T18:49:00.252Z",
    "id": "2848f97b-b669-4ec3-89b4-9f125e14ce5e",
    "object": {
      "definition": {
        "description": {
          "en-US": "A user has visited the landing page on EOSLearn"
        },
        "name": {
          "en-US": "EOSLearn Landing Page"
        },
        "type": "https://xapi.learning-transformation.com/activitytype/pageview"
      },
      "id": "https://xapi.learning-transformation.com/activities/eoslearn/homepage",
      "objectType": "Activity"
    },
    "verb": {
      "display": {
        "en-US": "viewed"
      }
    }
  }
}
```



Inside the LRS



Inside the LRS



Feedback Use Case: Test Item Analysis

- Point Bi-serial Correlation (PBC) relates observed item responses to a total test score (+1 to -1)
- A high coefficient means students selecting the correct response achieved higher total scores (coefficient closer to 1)
- A point bi-serial rating of .21 or less indicates that the test item should be revised

End of Course

Instructor Analysis

Assessment Analysis

Completion Time Analysis

Publish to ELC

Measurement and Assessment Quiz Results: + Select to show

Post-Assessment Results: + Select to show

Point Biserial Correlation (PBC) scores can now be found under the Assessment Item Analysis section.

ASSESSMENT ITEM ANALYSIS (POINT BISERIAL CORRELATION):

Below is a record of how students performed overall on each question in a given assessment. The question names are displayed across the 'x' axis of the charts below, and the passing percentages are display on the 'y' axis. The numbers inside of the columns represents the respective point biserial correlation for that question. Read below for a more detail explanation

POINT BISERIAL CORRELATIONS EXPLAINED:
[See Detailed Explanation...](#) **Click here for a detailed explanation on how PBC works**

Pre-Assessment Results: - Select to hide

4 out of 4 students have completed this exam (answered every question). Only their scores have been factored into the Point Biserial Correlation score for each respective question listed below.

Download .csv report

Only students that have completed the exam will be scored for PBC

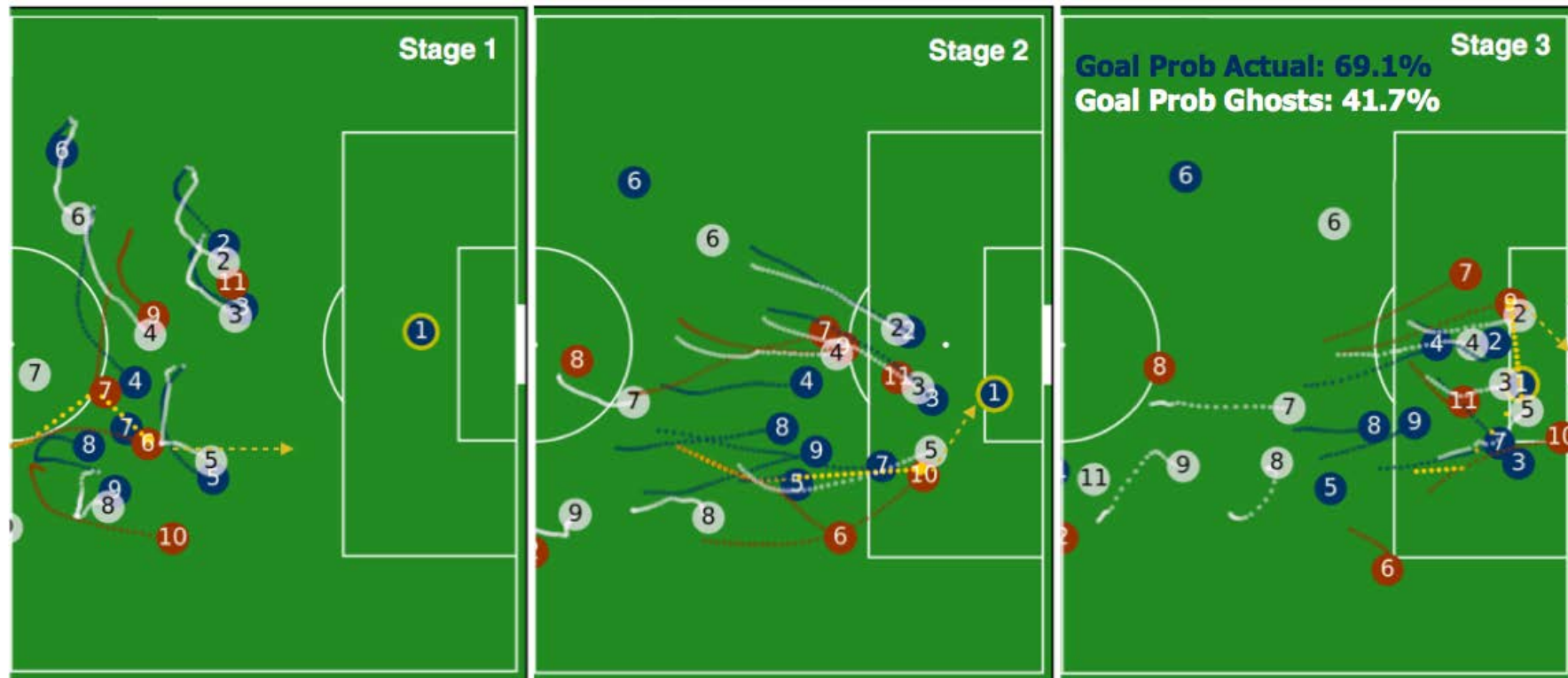
PBC scores will be listed here for each respective question on the exam

PBCs will now be recorded in the .CSV reports

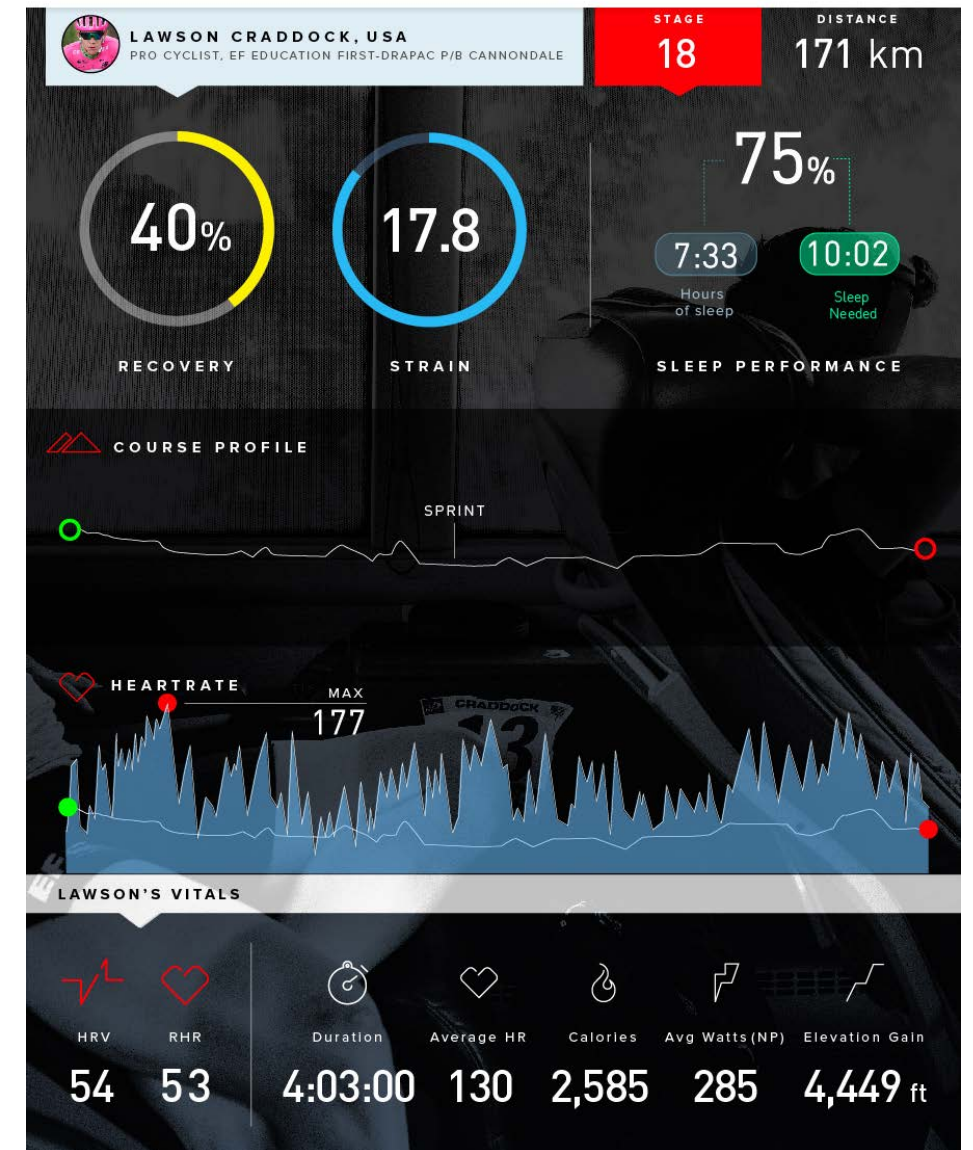
Question	Passing Percentage	PBC
Question 1	20	0.87
Question 2	0	0.00
Question 3	0	0.00
Question 4	20	0.17
Question 5	20	0.17
Question 6	45	0.90
Question 7	75	-0.17
Question 8	45	0.30
Question 9	20	0.17
Question 10	0	0.00
Question 11	20	-0.52
Question 12	0	0.00
Question 13	20	-0.52

Potential Applications and Extensions

- Targeted interventions based on observed or predicted learning gaps/decay
- Machine Learning to develop expected performance for early warning system
- Data-driven Learner “Personas”
- Big data analysis of sensorized data, e.g., Aircrew Training



“Whoop”



Disney Sports Analytics



Questions?



AMCx





- Massive Online Open Course (MOOC) platform built on the open-source edX platform developed by MIT and Harvard.
- This platform supports self-paced online learning, instructor-led learning, and blended learning.
- Allows an instructor or curator to add courses from any source to the AMCx platform. This includes courses hosted outside of AMCx from sources like Treehouse, Youtube, and Udemy, among others.

REGISTER Sign in

Welcome to the
AMCx Learning Portal

"Tell me and I forget, teach me and I may remember,
involve me and I learn." - Benjamin Franklin

FEATURED COURSES

 DemoX edX Demonstration Course	 GLOP Self-Paced Leadership Skills and Techniques	 USAIRMOBILITYCOMMAND AMC_RGMC1 RGMC1	 USAIRMOBILITYCOMMAND AMC_RGMC2 RGMC2
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AMCgo

- Designed to enhance ILT, primarily in a classroom setting but also has features to allow for access of learning resources any time
- AMCgo hosts the suite of Rapid Global Mobility Courses (RGMC) including two online courses and one classroom course.
- You can go there right now on your phone and learn about AMC's mission:

<https://amcgo.learning-transformation.com/>



The image shows a screenshot of the AMCgo 'Tools' menu. At the top, the text 'AMCgo' is displayed in a large, blue and yellow font against a background of a blue sky with clouds. Below this, a dark blue header bar contains the word 'Tools' in white. The main content area is white and features six tool cards arranged in two columns. Each card has a circular icon, a title, and a brief description.

Icon	Tool Name	Description
ABC	AMCglossary	Find the definitions and acronyms you need, when you need them.
Open Book	AMCresources	Explore tools and resources that help you succeed as an AMC Airman.
Calendar	AMCnews	Find out what's happening across the command.
Aircraft	AMCaircraft	Explore our mobility aircraft and discover their unique capabilities.
Organizational Chart	AMCorgchart	Explore the entire DoD organizational structure and see where AMC fits in.
Map	AMClocations	Explore AMC's global reach using our interactive map.

AR Prototype Statements: Launched

Statement successfully sent to the LRS!

```
{
  "actor": {
    "objectType": "Agent",
    "name": "dummy_user",
    "mbox": "mailto:dummy_user@icf.com"
  },
  "verb": {
    "id": "https://xapi.learning-transformation.com/verbs/launched",
    "display": {
      "en-US": "launched"
    }
  },
  "object": {
    "objectType": "Activity",
    "id": "https://xapi.learning-transformation.com/activities/AMC/TO/AR-Tool",
    "definition": {
      "type": "https://xapi.learning-transformation.com/activities/AMC/TO/AR-Tool",
      "name": {
        "en-US": "AR Tool "
      },
      "description": {
        "en-US": "Optional description about this activity goes here."
      }
    }
  },
  "id": "85e71131-e81e-49dc-887a-b6a87250b8ac",
  "version": "1.0.1"
}
```

AR Prototype Statements: Viewed

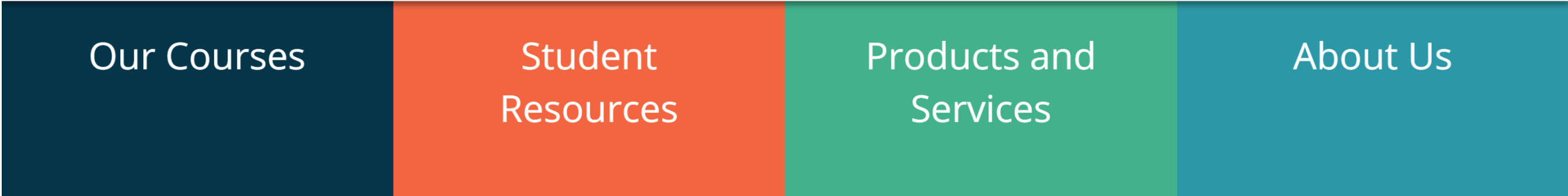
```
Statement successfully sent to the LRS!  
{  
  "actor": {  
    "objectType": "Agent",  
    "name": "dummy_user",  
    "mbox": "mailto:dummy_user@icf.com"  
  },  
  "verb": {  
    "id": "https://xapi.learning-transformation.com/verbs/viewed",  
    "display": {  
      "en-US": "viewed"  
    }  
  },  
  "object": {  
    "objectType": "Activity",  
    "id": "https://xapi.learning-transformation.com/activities/AMC/TO/Video",  
    "definition": {  
      "type": "https://xapi.learning-transformation.com/activities/AMC/TO/Video",  
      "name": {  
        "en-US": "Video"  
      },  
      "description": {  
        "en-US": "Optional description about this activity goes here."  
      }  
    }  
  },  
  "id": "b7dd2572-1ff9-468a-ae4f-92b7683ba860",  
  "version": "1.0.1"  
}
```

AR Prototype Statements: Accessed

```
Statement successfully sent to the LRS!  
{  
  "actor": {  
    "objectType": "Agent",  
    "name": "dummy_user",  
    "mbox": "mailto:dummy_user@icf.com"  
  },  
  "verb": {  
    "id": "https://xapi.learning-transformation.com/verbs/accessed",  
    "display": {  
      "en-US": "accessed"  
    }  
  },  
  "object": {  
    "objectType": "Activity",  
    "id": "https://xapi.learning-transformation.com/activities/AMC/TO/3-D-Model",  
    "definition": {  
      "type": "https://xapi.learning-transformation.com/activities/AMC/TO/3-D-Model",  
      "name": {  
        "en-US": "3-D Model"  
      },  
      "description": {  
        "en-US": "Optional description about this activity goes here."  
      }  
    }  
  },  
  "id": "20c1d4aa-a9ce-464e-a458-65473126df60",  
  "version": "1.0.1"  
}
```

AR Prototype Statements: Spent (10 minutes in it)

```
Statement successfully sent to the LRS!  
{  
  "actor": {  
    "objectType": "Agent",  
    "name": "dummy_user",  
    "mbox": "mailto:dummy_user@icf.com"  
  },  
  "verb": {  
    "id": "https://xapi.learning-transformation.com/verbs/spent",  
    "display": {  
      "en-US": "spent 10 minutes in"  
    }  
  },  
  "object": {  
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    "definition": {  
      "type": "https://xapi.learning-transformation.com/activities/AMC/TO/AR-Tool",  
      "name": {  
        "en-US": "AR Tool"  
      },  
      "description": {  
        "en-US": "Optional description about this activity goes here."  
      }  
    }  
  },  
  "id": "d7661f97-cdf3-43cf-8675-97ed1a2046db",  
  "version": "1.0.1"  
}
```



U.S. AIR FORCE

Building Airpower... From the Ground Up!



Training and Education total force Airmen for a broad spectrum of expeditionary operations today and tomorrow



AIRPOWER 360 AND AIRMAN DEVELOPMENT PLANS

AP360 is a best practice process and automated tool that furthers the learner-centered strategy at the core of the C of L

- Developed on the foundation of the Airman Competency model, including AF Institutional Competencies
- Provides targeted feedback (Individual Feedback Report) on strengths and developmental needs on individual 360 results; to know where to focus, Airmen need to know where they stand and then how to improve—can be combined with coaching
- Airman Development Plans (ADPs) (Individual Development Plans) provide a structured path for self-development to fill performance gaps
- Enhances expertise & engagement of Airmen learners

Course Name: EST Marksmanship Novice Training Course (FULL) | Course Date: 05/06/2017

LEARNER GROUPS | Learner Group: Class View

Expected (E) Actual (A) | Course Milestones

Variables	M1 Pre-Test	M2 Course Lessons	M3 Prone w/ Feedback	M4 Kneeling w/ Feedback	M5 Test, No Feedback
Performance Measure			4.13 0 A 9	3.39 0 A 9	3.89 0 A 9
Completion Time	3m:23s 3 A 35	12m:31s 3 A 35	24m:31s 3 A 35	22m:18s 3 A 35	3m:32s 3 A 35

Variables	M1 Pre-Test	M2 Course Lessons	M3 Prone w/ Feedback	M4 Kneeling w/ Feedback	M5 Test, No Feedback
Performance Measure			4.13 	3.39 	3.89
Completion Time	3m:23s 	12m:31s 	24m:31s 	22m:18s 	3m:32s
Self-Efficacy	2.4 	2.4 	2.4 	2.4 	2.35
Cant			0.0026 	0.0348 	0.0152
Triager Pressure			183.97 	183.67 	183.53

Variables			
Performance Measure			M5 st, No Feedback 3.89 9
Completion Time			3m:32s 35
Self-Efficacy			2.35 7
Cant			0.0152 -0.1 0.13 183.97 183.67 183.53

Milestone: M5 - Self-Efficacy

Number of Learners

Self-Efficacy Level	Number of Learners
High Self-Efficacy	3
Medium Self-Efficacy	34
Low Self-Efficacy	40

Continuous Variables

Bold = Statistically Significant Variable

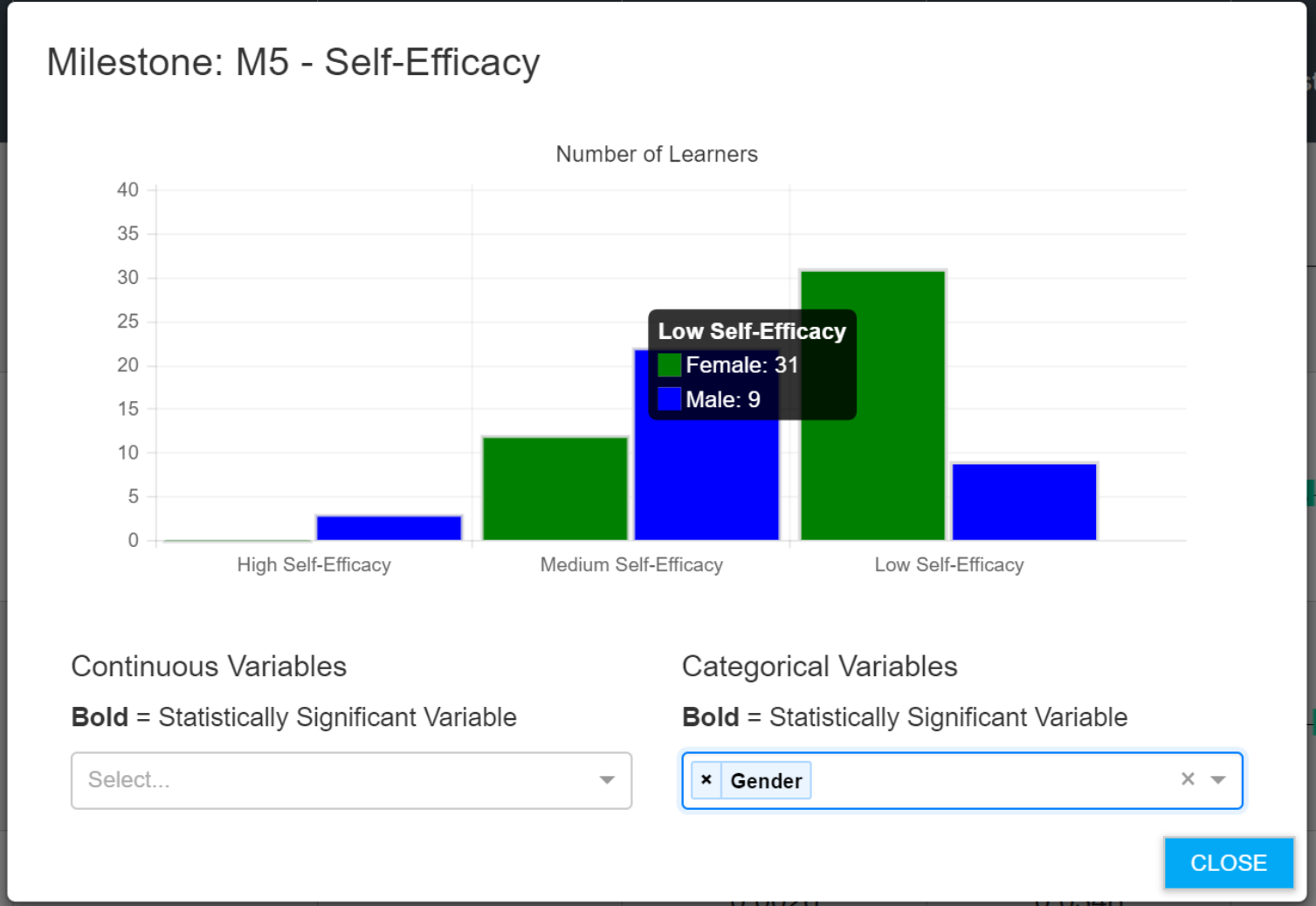
Select... ▼

Categorical Variables

Bold = Statistically Significant Variable

Select... ▼

CLOSE



Variables	M5
Performance Measure	3.89 A
Completion Time	3m:32s 35
Self-Efficacy	2.35 A
Cant	0.0152 A
	0.0020 A
	0.0040 A
	0.0152 A
	-0.1 0.13
	-0.1 0.13
	-0.1 0.13
	183.97
	183.67
	183.53

Course Name: EST Marksmanship Novice Course Date: 05/06/2017

Training Cou

LEARNER GROUP

Expected Actual

Variables

Performance Measure

Completion Time

Self-Efficacy

Learner Groups

Select one variable

Bold means it mathematically impacts performance (numerical data only)

Default

- Class View

Demographics

- Age
- **Military Service**
- **Service Time**

Psychomotor

- Bottom Pressure
- **Breathing**
- **Cant**
- Heartrate
- **Persperation (EDA)**
- Posture
- Respiration Rate
- Temperature
- **Trigger Pressure**

Affective

- Self-Efficacy

Performance

- MPICZP
- Grouping Size

CLOSE

group: Class View

M5

est, No Feedback

3.89

A

9

3m:32s

A

35

2.35

A

7

Variables	M1 Pre-Test	M2 Course Lessons	M3 Prone w/ Feedback	M4 Kneeling w/ Feedback	M5 Test, No Feedback
Performance Measure			3.78 	3.2 	3.96
Completion Time	3m:15s 	12m:52s 	24m:51s 	22m:51s 	3m:16s
Self-Efficacy	1.47 	1.47 	1.47 	1.45 	1.43
Low Self-Efficacy			0.0013 	0.0301 	0.0112
Cant					
Trigger Pressure			184.43 	183.81 	183.88
Breathing			52.35 	51.23 	51.72