
2023 CAE in Cybersecurity Symposium

Student Development in Cyber Security using Game Based Learning

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Presenters



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Agenda

Presenters

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Abstract

Facts and Figures

Fun and Games

Abstract

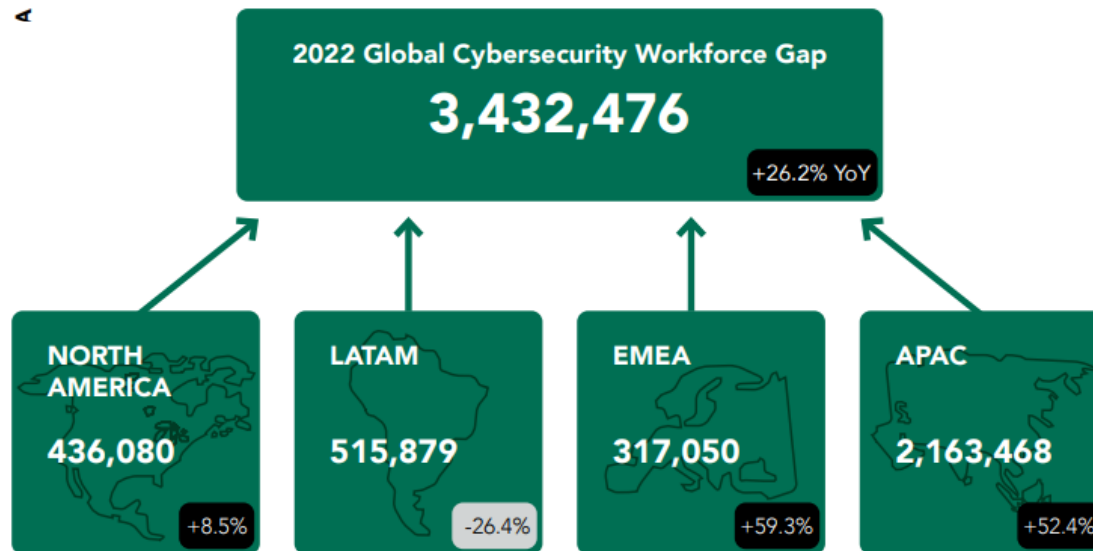
As more and more information technology workloads move to the cloud, it is imperative that students entering the workforce have the skills needed to implement cyber security practices. The concepts of:

- Identity and Access Management
- Least privilege access
- Compliance enforcement
- Incident response

are theoretical concepts that may take years to put into practice once students reach the workforce, but with Game based learning tools such as Amazon Web Service's Cloud Quest students and cyber security professionals with legacy on-premise skills can start applying these concepts in a simulated and safe cloud environment.

Facts and Figures – The Good

- We estimate the size of the global cybersecurity workforce at 4.7 million people (ISC², 2022, p. 3)
- Worldwide gap of 3.4 million cybersecurity workers (ISC², 2022, p. 3)



Facts and Figures – The Bad and the Ugly

- The number of undergraduate students exclusively enrolled in distance education courses was 186 percent higher in 2020 than in 2019 (7.0 million vs. 2.4 million) (National Center for Education Statistics, 2022).
- Estimates of dropout rates are 10% to 20% higher than their face-to-face counterparts (Christensen & Spackman, 2017).

Game Based Learning

Is an approach to education that...

- Uses games to teach specific knowledge, skills, or concepts.
- Creates immersive and engaging learning experiences.
- Minimizes reading and one-way communication.
- Uses an in-game point or reward system to tap a learners competitive spirit.
- May incorporate a social or group approach to learning to enhance the experience.

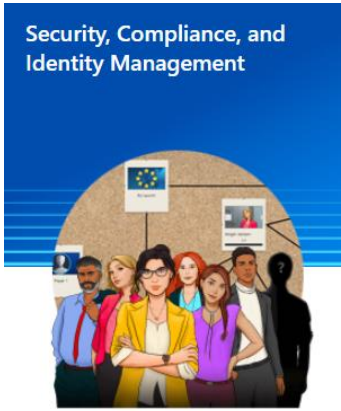
“Learners consume 3 to 4 times more content when immersed in a game-based learning environment.”

Published by TSIA - <https://www.tsia.com/resources/the-impact-of-the-metaverse-on-training>

Simplified Game Based Learning Tools

- **Tools**
 - Online Polls
 - Structured Lab assignments
 - Kahoot
 - Quizlet
 - Edpuzzle
- **Benefits**
 - Anywhere anytime
 - Analytics
 - Reinforce Concepts
- **Drawbacks**
 - Monotonous
 - Limited new learning

Gamed Based Learning - Azure



Keeping up Appearances

The nation's largest e-retailer, Best for You Organics, is under attack! Gather clues and evidence to investigate a ransomware attack.



In the Crosshairs

It's all hands on deck at Best for You Organics, as it is under another cybersecurity attack and you are working through a high-priority cybersecurity alert.

Gamed Based Learning - AWS

Core Security Concepts

Help improve security at the city's stock exchange by ensuring that support engineers can perform only authorized actions.

AWS Services | AWS Identity and Access Management (IAM), Amazon EC2, Amazon Relational Database Service (RDS)

Assignment Location

On completion, you will be able to:

- Identify the IAM creation process and the difference between IAM users, roles, and groups.
- Determine the structure and components of IAM policies.
- Identify the AWS Shared Responsibility Model and compliance programs.

Compliance Enforcement

A hospital has many application servers that are hosted based on the requirements of many different departments and projects. The monthly bills are increasing, and the hospital's new CFO wants to know the detailed billing on application servers and other resources. In addition, the hospital is going through an audit, and the compliance officer wants to confirm that each application server is using the approved IAM instance profiles.

AWS Services | AWS Config, AWS Systems Manager

Assignment Location

On completion, you will be able to:

- Demonstrate compliance remediation methods by using AWS Config, AWS Systems Manager and AWS Lambda.
- Determine how to identify and remediate noncompliant AWS resources.

Playing with Encryption

A law office is looking to explore the encryption features on AWS. A new engineer is investigating how to encrypt and decrypt customer case files and data in text file format.

AWS Services | AWS Key Management Service (KMS), Amazon EC2

Assignment Location

On completion, you will be able to:

- Identify the fundamentals of AWS Key Management Service (AWS KMS).
- Determine how to construct an AWS KMS customer managed key.
- Demonstrate how to use KMS keys and generated data keys to encrypt and decrypt data.
- Examine the concept of AWS KMS multi-Region keys and key rotation.

Summary

- 3.4 million Cyber Security Professional vacancies.
- Legacy in-class methods for keeping students engaged do not apply to online modalities.
- Drop out rates for online only students is 20% higher.
- Game Based Learning modalities can triple content retention.
- Higher education leadership should encourage faculty to use game based e-pedagogy.
- Work with existing providers to enhance the learning experience now!

Demonstration

Identity and Access Management

Good question. The answer is no. Librarians love to type, so many of them prefer to use the AWS Command Line Interface to interact with their Amazon S3 folders.

Close ← 13/15 →

Assignment Rewards

- +20 Gems
- +3 options
- +10 AWS Identity and Access Management (IAM)
- +5 Amazon EC2
- +5 Amazon S3

Learning Objectives

- Create an IAM policy to secure S3 folders.
- Learn about IAM roles and user groups.
- Learn how IAM policy variables work.
- Generate AWS CLI access keys.

What questions can we answer???

References

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