

StarsCTF: a Capture the Flag Experiment to hack Player Types and Flow Experience



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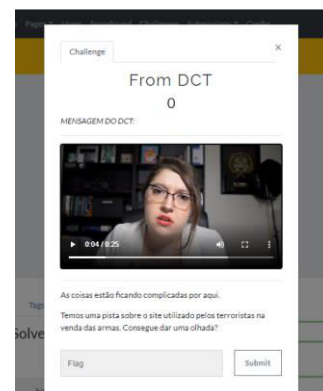
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INTRODUCTION

The Information Security professional is responsible for protecting the organizations' environment. In Brazil, the dropout rate on high degree courses in Information Security in 2018 was 36.6%. In order to increase the engagement in their studies, a proposed solution is the use of gamified environments. The use of gamification in cybersecurity enables the training of practical skills in a safe environment, developed for learning and which allows trial and fail. This method is called **Challenge Based Learning**.

WHAT IS STARSCTF?

StarsCTF is a competition that was created with the aim of being a scientific experiment between gamified environments. Well-known professionals in the field were invited to develop the challenges and collaborate, this is the reason for the name **stars**.



Open World mode (traditional gamification)

DMC mode (new gamification)

OBJECTIVE

Analyze how each player type was impacted by Capture the Flag using the Flow scale as metric

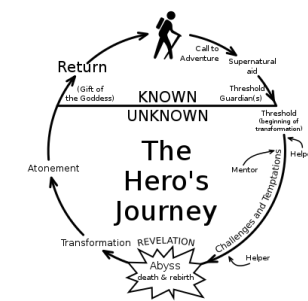
- Objective 1:** Evaluate Flow Experience x Player Types
- Objective 2:** Evaluate Flow Experience x Game Mode

MATERIALS AND METHODS

- Paired Experiment Design
- Two Sessions (Day 1 and Day 2)
- Three Surveys:
 - QPJ-BR – Questionário de Perfil de Jogador – BR
 - DFS – Dispositional Flow Scale
 - FSS – Flow State Scale

THE HERO'S JOURNEY

The narrative developed for DMC mode used the Hero's Journey as the basis for the story progression in the competition

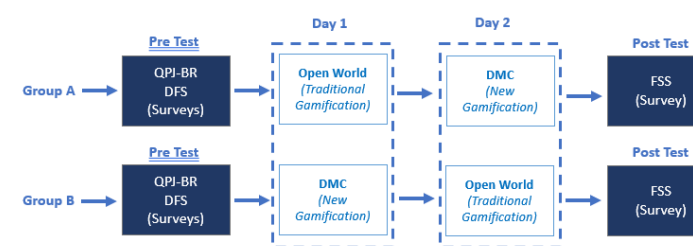


RESULTS

- Achievement and Immersion player types had better performance compared to Socializer
- Traditional Gamification (Open World) had a better performance instead of the proposed new one (DMC)

FUTURE WORKS

StarsCTF It is currently an educational tool that will launch content and discuss topics related to information security learning. (new topics available on February 2021)



Experiment Design

Acknowledgements: the **#starsctfteam** (Carlos Edoardo, Guilherme e Henrique), **#designers** (Allan Kardec, Igor, Raul), **#collaborators** (Marina e Anchises), **#squad** (Ana Claudia, Daniele, Mirella, Talita, Yara)