TEACHING AND LEARNING

***Exfiltration!* Gamifying CI Instruction with a Virtual Escape Room**

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Adaptive innovation creates competitive advantage for businesses in the COVID-19 era, and the same can be said for business research instruction (Bar Am, Furstenthal, Jorge, & Roth, 2020). As instructors face uncertainty in teaching delivery modes, adaptive instructional design prioritizes learning activities that can be delivered in-person, remote, or hybrid; synchronously or asynchronously; and one-on-one or at course or program scale. Virtual escape rooms, in which online teams use clues to solve a series of thematic puzzles in order to "escape" before their game time expires, are being adapted for remote library instruction (Pun, 2020).

Exfiltration! A Competitive Intelligence Virtual Escape Room (Exfiltration!) is an original virtual escape room that I created for business research instruction at Penn State Berks and our local affiliate start-up incubator, Berks Launchbox (Hartman-Caverly, 2020). It applies the conventions of virtual escape rooms to gamify the teaching of competitive intelligence (CI) research techniques where information is gathered about an entity's market landscape (Gilad, 2015). I was asked to prepare an intellectual property (IP) presentation for the Penn State Berks Entrepreneurship Club, and I wanted to sneak in some research instruction with a fun and engaging delivery. (You may wish to play *Exfiltration!* prior to reading further, as the remainder of this article contains escape room spoilers! See <https://psu.libwizard.com/f/ExfiltrationEscRoom>.)

Inspiration struck following the successful implementation of a Banned Books Week virtual escape room. Next, I workshopped the concept of an exfiltration-themed virtual escape room, in which students would use CI techniques to solve clues. I decided to incorporate freely available content and search tools to facilitate ease-of-use, increase student awareness of information sources available after graduation, and enable access by Berks Launchbox clients. While planning *Exfiltration!*'s narrative arc, I determined that a patent search and assignee analysis could lead to locating a publicly-traded company's regulatory annual 10-K filing. Patent searching is an interdisciplinary research area that builds student awareness of intellectual property rights, industry trends, competitive landscapes, and commercialization, while introducing students to a primary information source in their disciplines.

From a gamified learning perspective, I wanted students to demonstrate search persistence using a range of techniques, including image searching, known item metadata searching, browsing, manipulation of linked data, and scanning through a document to find specific facts. I created *Exfiltration!* using Springshare's LibWizard tutorial builder, which provides a number of useful design features for virtual escape rooms, such as side-by-side question and interactive website display, conditional logic to facilitate the display of hidden hints, and a timer that will lock the escape room and invoke felt time-pressure that enhances the immersive experience (Nahl, 2005). The primary challenge of designing *Exfiltration!* was

finding a patent that met all the necessary criteria to facilitate gameplay and provide students with a successful experience.

Upon accessing the virtual escape room, players are presented with a mood-setting narrative and a single image (See Figure 1 for image). The challenges begin with performing a reverse image search to determine the original image source: a patent drawing. Players must then use Google Patents to identify the patent assignee, assignees of similar patents, relevant Cooperative Patent Classification (CPC), and a US-based company owning numerous patents in this same CPC. Finally, players locate the 10-K filing of that US-based company to identify its major competitors. No prior knowledge of the patent research process is necessary, as optional hints are provided to help locate the answers.

*Figure 1. Welcome Screen of the Exfiltration! Virtual Escape Room. This welcome screen from the *Exfiltration!* virtual escape room shows the narrative, patent image challenge, and timer.*

Seven students and two faculty advisors in the Penn State Berks Entrepreneurship Club piloted *Exfiltration!* during my virtual IP presentation. One team was able to complete the escape room, and the other ran out of time while working on the final challenge. Two students submitted optional feedback forms, both awarding the overall escape room experience five out of five stars.

As a result of the pilot, I am working with a participating faculty member to adapt *Exfiltration!* as a learning activity in an upper-level undergraduate management course focused on new venture formation. In addition to collecting informal student feedback using the same optional form, the adapted independent learning activity will also include required metacognitive reflection questions about students' experiences. Other entrepreneurship faculty are also interested in gamified library instruction. Not only did *Exfiltration!* succeed in my pilot as a CI learning innovation, it also created new opportunities for business research instruction.

References

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