

Embedded Ethical Experiences: Designing Playable Case Studies for Ethics Education

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Providing learners with authentic ethical situations in a formal educational environment can be challenging. While we encounter ethical situations daily (e.g., how we treat those around us; temptation to illegally use copyrighted content), some types of ethical situations are high-risk, rare, and/or embedded into contexts that learners don't typically inhabit. For example, learners studying user experience design may someday be pressured by a boss to implement "dark UX" patterns to increase sign-ups by deceiving users. Learners can benefit from the ability to practice recognizing unethical behavior, making decisions in ethically complex contexts, and learning from their responses. A new genre of highly realistic educational simulations, called Playable Case Studies, can provide a context in which players can experience ethical conundrums in a safe environment, helping learn from mistakes and successes. In order to make the experience authentic and not obviously about ethics, it makes sense to embed ethical experiences into simulations focused on other topics in which ethical issues arise. An example of this approach is described, wherein an ethical situation is embedded within a cybersecurity Playable Case Study called Cybermatics. Many questions remain about how to design and evaluate such experiences in ways that lead to effective learning.

CCS CONCEPTS • Social and professional topics • Professional topics • Computing profession • Codes of ethics

Additional Keywords and Phrases: ethical simulations, playable case studies, ethics education

1 INTRODUCTION

Acting ethically requires both the heart and mind. It is more than a cerebral application of well-understood principles and models. It is often about making difficult decisions in the heat of the moment when our self-interest is on the line. Research has shown that even people who care about morality often behave dishonestly [5]. Unethical boundaries are often crossed without realizing it and predictable situations and social forces lead to unethical behavior [5]. If the goal of ethics education is to improve ethical behavior, then we must help students experience and reflect upon the temptation to cross ethical boundaries that they may not recognize. We must help them feel the social pressure that can lead to doing the wrong thing, and then reflect on what led them to act immorally.

One promising and common approach to facilitating ethical learning is to use case studies. Discussing ethical cases can help learners identify non-obvious ethical implications, consider how to respond to challenging situations, and understand the complex situations in which ethics are embedded. They can cover topics that are high-risk, unlikely for learners to have already encountered, and in non-classroom contexts. Unfortunately, traditional written case studies have severe limitations. Because the learner is not embedded within the case itself, they have no skin in the game. Their dissociation makes cases unrealistic, because they don't evoke the

emotions and context needed to replicate authentic ethical scenarios. While written cases that include more emotional and socio-relational power dynamics can lead to increased transfer of ethical decision-making [12], one is left wondering how much more useful cases could be if participants were embedded within them.

Several researchers have used experiential simulations [6] to provide more participatory ethical learning experiences. These have been shown to help improve ethical decision-making [3], increase ethical understanding [9], and provide a more personalized experience [2]. Despite the promise of such simulations, many interactive case studies lack a sense of realism, either having players participate as 3D avatars [9] or written choose-your-own adventure experiences [9]. On the other end of the spectrum are highly realistic in-person simulations wherein medical students interact with mannequins and/or real-world actors who play the role of patients [7]. While they have been shown to be effective in many ways [7], they are unlikely to be feasible to implement in domains with less funding for training.

For several years, a group of researchers at Brigham Young University and the University of Maryland have been exploring the development of Playable Case Studies (PCSs) [1], a new genre of epistemic game [11] that place players into professional contexts alongside fictional characters that interact with them through everyday technologies such as email and corporate intranets. PCSs are heavily influenced by the concept of “This is Not a Game” (TINAG), a core principle of Alternate Reality Games, that creates a realistic enough environment where players can easily suspend disbelief [4]. We have created PCSs for several domains including cybersecurity [8], technical writing [1], Spanish language learning, and museum curation activities. Students consider PCSs to be highly realistic and particularly useful at helping understand the professional contexts in which they will work. These unfolding narratives have players play “as themselves” rather than as an avatar, while they interact with fictional characters via a chatbot, email messages, or other standard communication channels (e.g., Figure 1).

While our PCSs have not been focused directly on ethics, we have begun to embed ethical situations into the simulations. For example, the Cybermatics PCS has players take on the role of a new employee of a cybersecurity penetration testing company wherein they help their team break into a company’s system in order to identify vulnerabilities that they can then patch. The ethics of penetration testing are embedded into the simulation, which has them sign a “scope document” which outlines what they are and are not allowed to do as part of the engagement – a document common for this type of work. During the simulation, the player identifies information about an “inside threat” (i.e., a person who has put a backdoor into the company system). One of the other penetration testers, Samuel McCarthy, private messages the player, sending them a link to a website that seems to be from the insider threat and asks the player to try logging into the site using the credentials they find as part of their legal sleuthing in the company’s system (Figure 2). Acting on Samuel’s recommendation is a clear violation of the scope document, which says they are only allowed to log into the main company website (<http://riptech.xyz>).

If the player acts on Samuel’s advice and logs into the site, they receive a message from their supervisor Kimberly Smitherton, that explains that what they have done is out of scope, illegal (according to the Computer Fraud and Abuse Act), and unethical. They are required to send an email explaining exactly what they did and why. If they do not act on it, and instead, for example, tell Samuel that this is clearly a breach of scope and not ethical to do, then they receive a note the next day indicating that it is a good thing that they did not act on Samuel’s advice since it would have been out of scope, illegal, and unethical. That way, either decision they make helps reinforce the ethical and legal behavior.

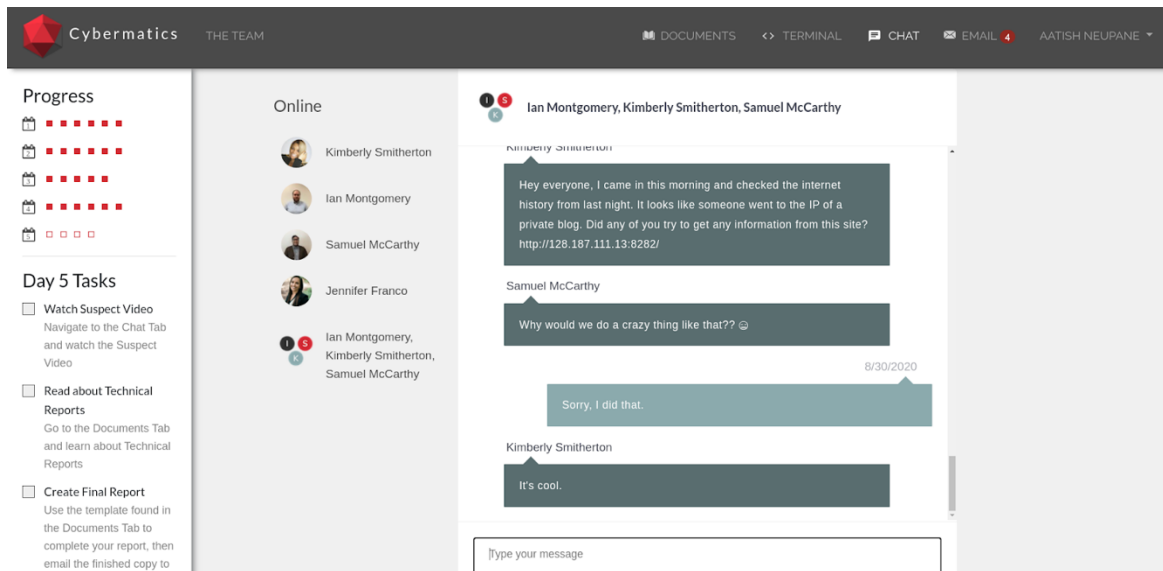


Figure 1. Cybermatics PCS collaborative chat interface showing a player chatting with fictional team-members.

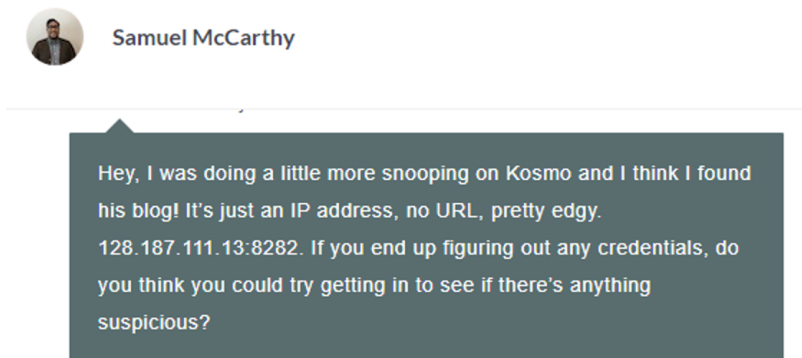


Figure 2. Private message from penetration testing team member tempting the player to go “out of scope”

So far, this approach has led to some profound learning experiences for students. We have written a book chapter on the subject that is not yet published [10] that shares preliminary results from 54 students in an introductory IT and Cybersecurity class. A significant number of students did go out of scope (around 30%). They typically apologized for their behavior indicating that they understood how why actions were unethical: “I went outside the scope of the project and used credentials found on [RipTech’s] servers to access information about the malicious user we found. I did not pay proper attention to the guidelines of the scope and fell in violation of this. I am very sorry, it will never happen again.” Several explained that they acted at the prompting of Samuel, which suggests that the social context in which we embedded the ethical dilemma was authentic enough to prompt unethical behavior.

While there are several design challenges to embedding ethical dilemmas into PCSs and related simulations, we see this as a promising approach for experiential ethical learning for several reasons:

- Players do not “expect” to encounter ethical dilemmas in the PCS, helping avoid performance bias and unauthentic ethical decision-making. For example, in Cybermatics, players believed that they were completing the simulation to learn what it is like to participate in a penetration test.
- Players can experience personally meaningful “temptations” that are embedded in a realistic social and professional context. For example, in Cybermatics players were “tempted” to “help” a more senior penetration testing team member Samuel.
- Players can learn from failure in a safe environment. As discussed, many students of Cybermatics who failed were able to own up to their failure, learn how to respond, and also commit to do better.

We are anxious to work with other ethics researchers to further explore the potential of embedding ethical situations into PCSs on a variety of topics. Several open questions about how to do this effectively exist:

- What techniques can be used to create “authentic” ethical dilemmas?
- How can ethical decisions be visible to players without giving away that it is an ethical decision?
- Do students learn more from failure than success? Should we prepare students, or let them fail in order to learn more?
- How can we make sure students don’t feel that we violate their expectations by throwing in an unanticipated ethical dilemma?

We look forward to exploring these and other issues related to ethics education at the workshop!

ACKNOWLEDGMENTS

This work was partially funded by the [National Science Foundation](#) Grant no: [1915620](#).

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