Increasing Student Engagement in Computing Ethics

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ABSTRACT

There is increasing call to integrate the teaching of ethics into computer science curricula. However, traditional approaches and available resources may not be engaging to many students. This work outlines a pedagogical approach of retooling a reference case study as a non-linear "choose your own outcome" narrative. Preliminary results suggest this approach positively affects student agency and engagement with the ACM Code of Ethics.

CCS CONCEPTS

• **Social and professional topics** → *Computing education*; *Codes of ethics.*

KEYWORDS

computing education, ethics, teaching strategies

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1 INTRODUCTION

There is a need to integrate the teaching of professional ethics into computer science coursework, as evidenced by increased attention toward revisions of professional standards and their inclusion in course learning objectives. [3] The ACM has established both a Code of Ethics and accompanying case studies to aid in the teaching and application of the Code in concrete situations. [1]

Initial attempts at Northern Vermont University in integrating the Code into course learning objectives focused on students reading published case study narratives and responding to open-ended prompts. Students selected and outlined principles from the Code that were applicable to a given situation and submitted responses detailing their arguments. Analysis of response submissions and a follow-up class discussion suggest that students found the prompts neither personally relevant nor engaging.

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2 OVERVIEW

Novel approaches to teaching ethics in computer science suggest that perspective-taking enhances student engagement with learning. [2] To this end, an ACM case study, entitled "Malware Disruption", was retooled as a non-linear narrative[1], with embedded hyperlinked choices that students must make to progress through the scenario.

This extension was designed with additional features intended to promote engagement and strengthen relevance to students' experience: (1) contextualizing background information from multiple viewpoints, (2) multiple pathways through the narrative that both diverge and converge, (3) multiple exit points from the scenario with differing consequences, and (4) a summary page that outlines major decision points across a playthrough.

An informal study of 3rd and 4th year undergraduates ($n = 20$) suggests that these modifications are more engaging to students and encourage more thoughtful responses, as indicated through student feedback and quantitative metrics. Notably, student responses over identical prompts were more focused post-intervention, with students citing fewer Code principles in their responses ($\mu = 1.2$ *vs.* $\mu = 2.4$) while greatly increasing their word counts ($\mu = 416.4$ *vs.* $\mu = 129.2$). Readability measures of responses suggest that students write more conversationally post-intervention, which may indicate students find the narrative more personally relevant (Flesch index score of 62 *vs.* 54).

3 CONTRIBUTIONS AND FUTURE WORK

This preliminary investigation suggests that this approach to generating source material for teaching ethics may be more effective than traditional case study readings, evidenced by gains in both student engagement and understanding. Because the revisions described are structural rather than content-dependent, their application is extensible to other domains.

For future work, I intend to expand upon this work by converting more of the ACM Code of Ethics case studies to a similar format and conducting a more formalized study over a larger sample of students.

REFERENCES

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[1] Accessible at https://anaptyxis.github.io/EthicsCaseStudies/MalwareDisruption.html