Undone Canadian CS Ethics: Real-world Moral Dilemmas and Responsibilities

Mohamed Abdalla
University of Alberta
mabdall2@ualberta.ca

Catherine Stinson
Queen's University
c.stinson@queensu.ca

Summary: This work argues that current curricula focus on abstract theoretical dilemmas or on professionalism while neglecting the concrete labour issues and worker responsibilities the majority of graduates will encounter in the technology industry.

1 Introduction

The majority of computer science (CS) students will go on to work in the technology industry as employees [1]. As such, the most significant ethical challenges they are likely to encounter will not be abstract societal dilemmas or those experienced by high level management making substantial product decisions, but rather the concrete conflicts that arise in a labour context such as a worker figuring out how (or whether) to execute upon management's orders, or an IT specialist helping address real-world problems faced by a non-tech firms.

We argue that while current CS ethics curricula address many important topics (e.g., privacy, bias, professionalism) [2], they rarely situate these topics in the labour context in which graduates will actually encounter them. Further, Canadian curricula rarely explicitly address labour-specific issues (e.g., whistleblowing, worker actions, etc.). In the tradition of "undone science", we argue that this framing gap leaves students with strong conceptual understandings of ethics as a theory but an *impotence in applying these concepts to the specific decisions and pressures they will face*. We contend that this omission constitutes a fundamental blind spot—a form of undone science—that undermines the very purpose of ethics education in the discipline.

2 Background

'*Teaching ethics*' can take many different forms. A study of course syllabi conducted by Fiesler *et al.* found most of the examined syllabi focusing on teaching students how to recognize ethical issues, assess and evaluate these issues, and make reasoned arguments [2]. The teaching of ethics is based on the assumption that more ethics education will produce practitioners who are more ethically knowledgeable and, consequently, more ethical in their actions. However, this assumption is not universally shared [3, 4]: Tenbrunsel and Messick argue that unethical decision making is not because of a lack of formal education in ethics, but rather due to 'psychological processes' which enable the unrecognized violation of ethical principals held by the decision makers [4].

In prior research (under review, [5]) we have provided evidence for this disconnect, demonstrating high levels of moral disengagement among computer science students. For example, we found that while students may agree on the theoretical importance of certain ethical concerns, they often struggle to apply these principles to their own career choices. This is particularly evident when students rationalize working for companies whose actions they find questionable. They often do so by externalizing moral responsibility (e.g., blaming management or regulators), or by invoking justifications such as employment desperation, the perceived necessity of prestige for career advancement, or the fact that everyone is partaking in an action. These rationalizations highlight a critical gap: students are not being taught how to reconcile their ethical values with the real-world situations they will encounter as part of the job market. This work seeks to directly address this gap.

3 Methods

This work pursues a three-pronged methodology. First we analyze the materials highlighted by syllabi of Canadian CS ethics courses. Second we contrast this with professional codes often referenced by Canadian practitioners (primarily the ACM Code of Ethics and Professional Conduct). Lastly, we leverage findings from prior work on moral disengagement to synthesize a set of questions or scenarios likely to be faced by students as employees.

3.1 Analysis of Syllabi

We defined ethics courses as courses which covered any societal aspect of computing as a large part of learning objectives. This would mainly be courses such as "Computing and Society" and "Ethics of Artificial Intelligence" where more general courses were not available. We were able to find, published and available online, the syllabi for courses from the following Canadian Universities: McGill University, Queen's University, Simon Fraser University, Toronto Metropolitan University, University of British Columbia, University of Manitoba, University of Toronto, University of Saskatchewan, University of Waterloo, and York University.

For each of these syllabi, our primary objective is to quantify how many of these curricula discuss: a) ethics topics in an applied manner, and b) aspects of labour ethics, such as the ethics involved in the job search, a worker's right to refuse, corporate social responsibility, and the role of whistleblowing, etc. The aim of such an analysis is to highlight the extent to which these issues of applied ethics are underrepresented in current ethics instruction.

3.2 Analysis of Codes

There were two professional codes most cited by Canadian CS ethics syllabi: The Association for Computing Machinery (ACM) Code of Ethics and Professional Conduct and the Canadian Association of Information Technology Professionals (CIPS) Code of Ethics and Professional Conduct. As CIPS's code is 'adapted from the ACM Code', we focused our attention on ACM's code which was read with the same lens as the syllabi: to explore if they discussed ethics in an applied manner or the labour aspect of ethics. We also evaluated the IEEE Code of Ethics with the same lens.

3.3 Moral Disengagement and Worker Dilemmas

Lastly, we leverage findings from prior work on moral disengagement to synthesize a comprehensive set of dilemmas or questions that students are likely to face as they enter the job market. This collection will serve as a foundation for future curriculum development, allowing educators to directly address common fallacies, misconceptions, and challenges faced by students. To facilitate discussion and practical application, we also generate plausible scenarios where each rationalization might be encountered by students and educators.

4 Results

4.1 Analysis of Syllabi

Most of the courses were offered in the final year of study. The average year of offering was (average: 3.2, min: 1, max 4). There was large variety in the topics covered. Relevant to our topic of exploration and related works, we found that all courses covered both micro- and macro-ethics[1] for computing professionals.

Some courses highlighted previous scandals of these companies (e.g., Cambridge Analytica), while others discussed how companies operated and how they were affected by regulations (e.g., IP law).

Two of the five syllabi discussed employees' professional responsibilities through the lens of professional ethics. Crucially, only one of the five syllabi explicitly framed the discussion of actors' moral responsibility in a manner that granted students agency as future workers, thereby grounding the topic in real-world actionable discussion. However, none of the syllabi explicitly discussed worker actions (e.g., whistle-blowing) or explicitly dealt with processes for working through ethical challenges (e.g., by addressing the justifications presented in the next section).

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[1]We use Hekert's differentiation between the micro- (consideration of individual and internal relations of the profession) and the macro- (consideration of the collective social responsibility of the profession) [6].

4.2 Analysis of Codes

We found that the ACM Code covered both macro and micro-ethics in two separate respective sections. The first section, dealing with general ethical principles covered many aspects of macro ethics (e.g., the need to avoid harm, respect privacy, etc). The second section, dealt mostly with professional ethics and was more detailed in the specifics of what individuals should do.

There were some acknowledgment of worker specific actions. For example, the code notes that "it may be necessary to 'blow the whistle' to reduce potential harm". Likewise, they state that individuals should consider challenging unethical rules through established systems before violating rules. However it is implied that it is possible that professionals would need to violate rules because they are unethical.

So while there are aspects of the code which could be read through a lens empowering workers to actions, they are not highlighted in the code. This contrasts with an entire section of the code directed at leaders (though to be fair, the code uses the term leader in the broadest possible sense which could include some workers).

Unlike the ACM code, the IEEE Code of Ethics was much more focused on micro (i.e., professional) ethics with only one sub-point dedicated to 'safety, health, and public welfare'.

4.3 Moral Disengagement

In our past work, we surveyed Canadian and US computer science students looking for jobs, regarding their ethical concerns. When we observed a discrepancy between their stated moral positions and their job application behavior (e.g., applying to a company with military contracts after stating that they are concerned with a company using their labour for military uses), we asked for the justification. Below, we synthesize the most common justifications provided. We believe that these justifications can be abstracted from any specific moral issue or concern.

We categorize justifications into two groups: a) those which admit moral culpability, and b) those which attempt to persuade that moral culpability lies elsewhere.

Common justifications which admit moral culpability (or compromise) are:

- "If I don't compromise on my morals, I will not be able to secure (or maintain) employment".
- "It is impossible to avoid [Action]".
- "I'm only working at company partaking in [Action] because of the benefit to my CV."

Common justifications which do not admit moral culpability:

- "[Action] is justified because all companies (or employees) do it".
- "Moral responsibility of [Action] is on managers/legislators/others".
- "If I don't do [Action], someone else will do it".
- "Despite working at company, I am not personally directly engaging in [Action performed by company]."

A brief reading of these justifications highlights how easily each of these justifications can be applied to different areas of concern.

5 Discussion

We see value in comparing analyses of institutional codes and course syllabi with student responses. Our findings suggest that students generally do not contest the moral status of particular actions, indicating that curricular and institutional efforts to emphasize the importance of ethical or conscientious computing have been effective. However, these efforts appear insufficient on their own. Students often do not perceive themselves as bearing responsibility for influencing corporate practices or for their own participation in them. We argue that this represents a significant blind spot in current ethics education — one that could be addressed by more explicitly focusing on the actions and responsibilities of workers when ethical conflicts arise within organizational contexts.

We believe it is important to consider why this gap persists. From the student perspective, their responses can be understood as adaptations to the structural pressures of the social and economic systems in which they are embedded—systems characterized by individualism and capitalist labor markets. From the instructor perspective, there are multiple possible explanations for why more directly applied, future-facing ethical issues are not addressed. Faculty may be unfamiliar with the relevant literature (e.g., many are not subject matter experts in the matters we discuss). Faculty may also be unaware of the nature or magnitude of the pressures students experience. In addition, instructors themselves may be subject to constraints. For instance, computer science culture often positions itself as apolitical, and explicitly engaging students in questions of worker responsibility may be seen as violating this norm. Past work has shown how bids for ideological expansion (such as asking students to reflect on their decision to engage with unethical entities) can be rejected in a myriad of ways [7] – making it difficult to meaningfully teach these topics. Moreover, as universities are increasingly framed as pipelines to employment, critically examining industry practices may be perceived as undermining institutional effectiveness when success is measured through metrics such as graduate hiring outcomes. Understanding how these structural, cultural, and institutional factors interact is an important area for future research, as it has direct implications for the design and effectiveness of ethics education.

Our work has multiple limitations. First, our work is focused solely on Canadian computer science students which limits generalizability of results. Second, syllabi only present a high level view of what courses will cover. It is possible that the courses cover employee concerns or more applied ethics concerns during class but do not highlight it in the syllabus. Further, while we aimed to compile a comprehensive inventory of student justifications, we acknowledge that the derived collection is necessarily non-exhaustive.

6 Conclusion

By undertaking this research, this paper makes several critical contributions to the field of "undone" computer science. We provide empirical evidence that a significant portion of CS ethics education neglects the applied nature of ethical challenges faced by graduates. Our work not only highlights this systemic omission but also proposes a new framework for ethics education that is grounded in the practical setting of a CS worker. By focusing on the hidden dynamics of moral disengagement, our findings offer concrete recommendations for educators on how to evolve ethics curricula. Ultimately, this research aims to provide future generations of computer scientists with the tools and knowledge necessary to act as ethical agents within their organizations, transforming them from passive observers into active participants in the ethical shaping of the technology they build.

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