


Chapter 8

Ethics and Responsible Computing in the Classroom:

Embedding Ethical Reasoning in Computer Science Education

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ABSTRACT

Rapid growth in computing technologies has been witnessed in recent decades. Along with progress, serious ethical concerns have been raised. Issues of privacy, security, algorithmic bias, digital well-being, and the responsible use of artificial intelligence have become common. Students of computer science are expected to become future designers and innovators. They must be trained not only in technical knowledge but also in ethical responsibility. However, traditional curricula have placed more focus on programming, systems, and theory. Ethical aspects have often been left out or given little attention. To build responsible digital citizens, ethics must be included in classroom learning. This chapter focuses on the need to integrate ethics into computing education, and pedagogical practices, challenges, and strategies for responsible teaching have been discussed.

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INTRODUCTION

Background: Computing Technologies and Ethical Concerns

The fast development of computing technologies has essentially changed the educational, industrial, and social aspects, reforming the decision-making process, knowledge creation, and provision of services. The field of artificial intelligence, data science, cybersecurity, and human-computer interaction is becoming an increasingly more mediating force in the allocation of resources and the human behavior, usually in large numbers and with little to no transparency (Khan et al., 2021; Holmes et al., 2022). With the integration of computing systems into educational institutions and daily living, ethical imperatives have ceased to be a professional idealistic pursuit to actual design and governance limitations that determine the material manifestation (Baumer, 2022; Belitz et al., 2024).

Professional organizations and policy groups are placing more emphasis on the idea that computing education should not just teach the student technical skills but also equip them with the ability to predict the effects of the computing technology, ethically assess trade-offs, and be responsible in relations to the complex socio-technical environment. The change reflects the increasingly high demands that ethics and responsible computing are not peripheral or optional subjects in modern computing programs but are now considered core subjects of computer science. The statistical data and tables in this chapter are intended as analysis tools and not description summaries. Rather than repeating narrative content, these artefacts are intended to support comparison across instructional models, clarify tensions between competing curricular priorities, and make explicit the structural implications of different pedagogical designs. Such use of visuals as conceptual scaffolds is consistent with design-based and framework-oriented scholarship in computing education, where diagrams and matrices are employed to support reasoning and curriculum planning rather than to present empirical measurements (Holmes et al., 2022; Brown et al., 2024).

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