Significant Trends in CS Educational Material: Current and Future

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To recognize the current and future trends and challenges in computer science education educational materials for the next decade, the authors of this work provide a conversation to voice the computer science community's experience and expertise on these trends. One of the biggest challenges for introductory computing courses in the next few years will be leveraging the new capabilities of Artificial Intelligent systems such as Open AI CodeX and GPT3 that can generate code from a textual description, explain code, and translate code between programming languages. These tools could drastically change how introductory programming is taught by allowing students to focus more on understanding code, modifying code, and testing code than on writing code. Learning content is increasingly shifting from paper textbooks to online learning systems, which include not just traditional text and figures, but increasingly use interactive items to provide students with better explanations and illustrations, extensive practice, and frequent immediate formative feedback, typically at a lower cognitive load than classical programming assignment. We will discuss challenges and opportunities for interoperability with publishing and learning management platforms. Another example is how guided-based instruments, such as peer team learning, open educational resources, or workbooks, are adaptive and hybrid according to students' needs.

Feedback and point of view from the CS community will be considered as part of the curricular practices "Future of CS educational materials" document, featured in the new version of the CS2023: ACM/IEEE-CS/AAAI Computer Science Curricula.

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