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From Floppy Disks to AI Tutors: Technology Changes, Human Guidance Endures

Written by: Norhafizah Hashim, Normaziah Abdul Rahman, Nor Azlina Aziz Fadzillah, Rozianiwati Yusof dan Sri Yusmawati Mohd Yunus

In late 1990s, learning programming was a very different experience from now. Students relied on bulky desktop computers, CRT monitors, and often installed compilers from floppy disks or CDs. The most common language taught then was C as the first programming language. Internet access was limited and could only be accessed from the computer lab. Most help came from the textbooks, printed manuals, or peers who maybe had the same level of skill as you.

Today, technology has advanced to a new level. Artificial Intelligence (AI) tools such as ChatGPT, GitHub Copilot, and other platforms can suggest, debug, optimize or even upgrade code rapidly. Learning has become much more personalised. Many learning platforms such as Coursera and Udemy offer a variety of learning courses that enable students to engage in self-paced study.

With the advent of the VUCA environment, teaching and learning are facing atypical challenges. The term VUCA, which denotes volatility, uncertainty, complexity, and ambiguity, refers to conditions that are inherently difficult to interpret, manage, or anticipate in planning (Wright & Wigmore, 2023). In the context of learning programming, new tools and platforms are emerging at lightning speed. A tool that is widely used this year may become outdated next year. Students face uncertain career skills, complex technologies, and an overwhelming number of online resources. While these changes bring exciting opportunities, they can also make the students feel lost in the fast-moving digital landscape.

This is where the human element shows its importance. Despite the rise of AI tools, online platforms, and immersive technologies, nothing can truly replace the value of direct interaction with lecturers and educators. Students cannot rely solely on AI tools in their learning. They need to develop the conceptual, critical, and logical thinking skills that are important in programming. The ability to analyze, interpret, and gather essential data and information from a problem is vital in producing the best solution. The foundations of these skills are best developed through the guidance, knowledge, and experience of lecturers. Then, the AI tools and the learning platforms can complement this learning process.

For example, when students ask the AI tool such as ChatGPT to suggest a program, the response may sometimes be too complex or does not address the specific

context. Occasionally, the program may produce logic errors when updating the prompts. Without a lecturer's guidance, students who are still building their understanding of programming may believe that the program suggested by AI is already complete and applicable.

A recent study by Vieriu and Petrea (2025) highlights how Artificial Intelligence (AI) brings many benefits to students. It also warns of challenges such as over-reliance on AI, reduced critical thinking, and issues of academic honesty. This shows why the role of lecturers remains important. When students consult a lecturer, they are not just receiving technical explanations, but also encouragement and relevant feedback. As highlighted in a University Canada West blog (2025), students can acquire critical thinking, emotional intelligence, and social skills from educators, qualities that remain irreplaceable by AI tools.

In today's VUCA world, lecturers remain steady guide for students. Their expertise helps balance the volatility of changing tools, reduce uncertainty about career paths, simplify complex coding tasks, and clarify ambiguous online resources. With their guidance, learning stays focused and meaningful. Technology in education has advanced rapidly from floppy disks to AI tutors and VR classrooms. Students may feel more comfortable asking AI the 'silly' questions. However, if the same questions are asked to lecturers, they can provide answers that align with the students' progress and support real understanding.

Technology will continue to shape programming education with faster and smarter tools and staying up to date with AI is important. Nevertheless, meaningful learning also requires the human connection that educators provide. Lecturer guidance, whether online or in person, remains essential, with face-to-face interaction often having the greatest impact.

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