From O/A levels to undergrad: Does early exposure to Computer Science matter?

Is O/A level Computer Science a springboard to undergraduate success, or can students without this foundation excel just as well?

Illustration: Adrita Zaima Islam

Computer Science has become one of the fastest-growing academic disciplines in recent years, with promising prospects in fields like software development, cybersecurity, and artificial intelligence. More students are choosing to study Computer Science in their O and A levels in an effort to obtain a competitive edge for their future academic endeavours, especially if they wish to pursue an undergraduate degree in Computer Science (CS) or Computer Science and Engineering (CSE), as both parents and students recognise the field's growing importance. This raises an important question: is O/A level Computer Science a springboard to undergraduate success, or can students without this foundation excel just as well?

"It definitely gives you a head start. Knowing the basics helped me grasp more complex concepts much more easily," says Ahnaf Islam, a Computer Engineering major at the University of South Florida, who studied both O and A level Computer Science. "However, that initial advantage only takes you so far. Eventually, it stops making a difference as you dive into more advanced topics that require a deeper level of understanding and application. If you are consistent with your studies, you

shouldn't really worry at all. Universities assume you know next to nothing about Computer Science when you begin your studies, and you won't really miss out on any of the basics."

The initial stages of an undergraduate CS/CSE degree might be intimidating for students with no prior experience. Even if universities create their curricula to accommodate students from different backgrounds, some students could still find it difficult to understand computational thinking or coding. Alternative learning options, such as coding boot camps, online courses, and self-study materials like Harvard's CS50 or websites like LeetCode and Udemy, can help close the gap.

Sheikh Arifin Ahmed, a Computer Science student at BRAC University, reflects on his own experience: "I really wish I had some exposure to Computer Science before starting university. Grasping coding concepts was tough for me at first, as I was completely new to the subject, having never studied it during my O/A levels. However, after working hard for a few weeks, I could overcome a lot of my struggles with CS."

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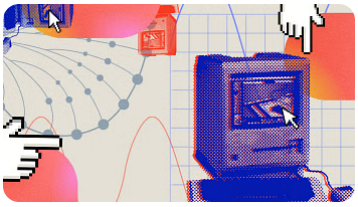

However, while subjects like Mathematics, Pure Sciences, and Economics have well-established teaching resources, O/A level Computer Science is still a relatively niche choice in many schools, with limited access to qualified teachers.

"I think studying A level Computer Science would have been more fruitful if my peers and I had the necessary resources, support, and qualified teachers. We mostly had to self-study and teach ourselves and each other," says Partha Pritom Ghosh, a second-year student at the University of British Columbia majoring in Computer Science with a minor in Data Science.

However, he still sees value in taking the subject. "A level Computer Science didn't directly help much in my undergraduate studies because the teaching approach was quite different, and we started from the basics again. However, it did give me a sense of what to expect. Even minimal help can make a difference, so if you're planning to study Computer Science further, O/A level CS is a valuable start, especially if you put in the effort to practise."

A common misconception is that early exposure to CS is only about learning to code. However, the field of Computer Science as a whole includes much more than just programming; it also includes algorithmic thinking, problem-solving, and even abstract mathematical ideas like discrete mathematics and graph theory. Some students may struggle in university, not because they lack

coding experience, but because they are unprepared for the theoretical depth required in subjects like data structures, automata theory, and computational complexity.

Muhammad Masrur Ahmed, now pursuing a degree in Computer Science and Engineering at North South University, shares: "The foundational concepts I picked up in O level Computer Science turned out to be more useful than the advanced topics we studied in A level. University courses tend to revisit and build upon the basics in much greater depth, so having a solid grasp of those fundamentals really makes a difference. The A level syllabus, though more advanced, often presents topics in a way that doesn't align with how CS is taught at university."

In the end, choosing to do Computer Science for O/A levels should be motivated more by personal interest than by a sense of necessity for success in college. While gaining early exposure to the field can help build a foundation and ease the transition to undergraduate coursework, it is not essential for excelling in university. Many top CS professionals and researchers started their journeys later in life, often using self-learning as a tool to catch up. Most university programmes are designed to teach from the ground up, meaning prior knowledge isn't mandatory. However, approaching the subject with genuine enthusiasm can make the process much more fulfilling.

So, if you feel excited by the prospect of understanding how algorithms work, exploring the inner workings of a computer, or coding your first programme, then you can go ahead and take that leap. But if your passion lies elsewhere, trust that there are many paths to success and fulfilment, and the best one is the one you truly enjoy walking.

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