

Exploring Computing Teachers' Readiness to Teach AI in Secondary Schools

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Abstract

Artificial intelligence (AI) is significantly impacting how we live, and the increased capabilities of generative AI applications have positioned AI firmly in the public domain. There is a growing interest in what AI might look like as a subject within the K-12 curriculum, whilst research on teachers' readiness for teaching AI is as yet limited. This paper describes a qualitative study investigating teachers' readiness to teach AI in secondary education. The interview study involved eight computing teachers with varying teaching experiences. We used reflexive thematic analysis for themes development. Findings suggest several indicators of teachers' readiness, including attitudes, prior AI experience, professional development, and access to quality resources. This paper contributes to ongoing debates about how to best support teachers to be ready to teach AI effectively at the school level.

Method

A qualitative interview study was conducted in 2023 with eight secondary school computing teachers in England. The primary data for this study were collected via 30-45 minute semi-structured interviews on Microsoft Teams. We followed Braun and Clarke's six phases of doing reflexive thematic analyses.

The first author conducted the interviews while the second author played a supervisory role during the data collection phase. Frequent debriefing sessions were held between both researchers to ensure that the first author's biases did not influence the data collection process. Reflexive thematic analysis (RTA) was used for data analysis, chosen because it allows researchers to interact with the data in a reflexive manner. Its flexibility enabled an inductive analysis of the data.

Themes

Themes	Description	Teachers said ...
Teachers' enthusiasm for AI education	Teachers express great enthusiasm for AI concepts to be introduced to K-12 settings	<i>It is important that young people learn AI because it is something that's part of life going forward . . . as an educator I would enjoy teaching.</i>
Responsibility for resource development, and with whom it lies	Teachers suggest that a central authority could enhance the development of quality computing resources	<i>All of a sudden we will see a mass amount of resources out there. . . Nobody's vetting these resources . . . they're not accompanied with training.</i>
The content of the AI curriculum	Teachers believe that (some) AI should be included in an AI curriculum	<i>"I would think that introducing it formally would be a good thing ... the subject matter of teaching AI in computing or in any subject, I think it needs to be introduced, probably in year six through year nine"</i>
The need for AI to encompass a multidisciplinary approach	Teachers argue that AI encompasses mathematics, computer science, and statistics, hence it shouldn't be approached solely as a computer science subject	<i>"... there's large mathematical sides of the AI, . . . General programming concepts, . . . where it's sort of almost mathematics and statistics"</i>

Results

The results of this study show that most teachers within our sample are **not adequately ready to teach AI in schools** due to insufficient professional development programs targeted at building their knowledge of AI and their confidence to teach in schools. Despite their enthusiasm about teaching AI in schools, they stressed the vital role teaching and learning resources play in the effective teaching of new concepts. They advised that authoritative bodies, such as government, oversee the resource development process to ensure the development of quality teaching resources to support computing teachers. This study contributes to work on teachers' voice and perspectives relating to AI education in schools.

Future work

Future work will involve investigating the nature of professional development programs that will equip computing teachers to teach the contents of AI and use AI technologies to enhance the teaching and learning of computing lessons in school.

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References

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