Post Primary Teachers' Perspectives on Machine Learning and Artificial Intelligence in the Leaving Certificate Computer Science Curriculum

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Abstract

This study collected insights from post primary Computer Science teachers regarding the integration of Artificial Intelligence (AI) and Machine Learning (ML) into the Leaving Certificate Computer Science (LCCS) curriculum in Ireland. By surveying teachers, the research evaluates current practices, identifies educational needs and challenges, and seeks to inform future developments to enhance AI education for students. Preliminary findings suggest a range of perspectives, highlighting the importance of professional development and the growing interest in AI within the curriculum.

CCS Concepts

• **Applied computing → Education**.

1 Background

The Leaving Certificate Computer Science (LCCS) subject was introduced in 2018, marking a significant milestone in the Irish education system [3]. Despite challenges such as teacher supply and the impact of COVID-19 restrictions, enrollment numbers for LCCS have steadily grown, with approximately 3,000 students sitting the LCCS examination in 2024 [5]. Comprehensive accounts of the subject are provided by Faherty et al [2] and Connolly et al [1]. LCCS encompasses various areas of computer science, including artificial intelligence (AI) and machine learning (ML). A single learning objective in the LCCS curriculum relates to AI and/or ML: *"explain*

when and what machine learning and AI algorithms might be used in certain contexts" [4].

2 Methodology

In June 2024, a 10 minute (online, optional and anonymous) survey was distributed to post primary teachers attending an in-person computer training event. A total of 41 teachers submitted responses: 25 identified as Experienced (currently or previously teaching the subject), 4 were Inexperienced (recognized to teach LCCS by the Teaching Council but with no teaching experience), and there were 12 other teachers. The survey consisted of 35 questions (both open and closed), and was designed to address the research question: *How prepared are teachers, and what are their attitudes towards AI/ML in the LCCS curriculum?* The 6 survey questions that are shown in Table 1 are addressed in this poster.

3 Discussion and Future Work

Question 1: Teachers who are actively teaching LCCS are more critical of the current AI education content, with a significant portion indicating that it does not prepare students well for careers in technology(13/25, 52%). Those who are not teaching or are inexperienced tend to be more unsure (11/16, 68.8%). **Question 2:** There is a clear preference among those with more teaching experience to increase the focus on AI in the curriculum (17/25, 68%). **Question 3:** There is a strong consensus across all experience levels that AI will become a more significant part of computer science education in the near future (36/41, 87.8%). **Question 4:** Inexperienced and other teachers have recently observed a significant increase in students' interest in careers related to AI and similar fields (12/16, 75%), though this trend is not as pronounced among experienced teachers (14/25, 56%). **Question 5:** Experienced teachers are more likely to have integrated real-world AI projects, though this practice is not yet universal(7/25, 28%). **Question 6:** There is a strong consensus, especially among experienced teachers, on the necessity of professional development in AI (24/25, 96%).

Teachers with more experience, tend to have stronger and more certain opinions, especially in recognizing the importance of AI in education and in integrating AI projects into their teaching. Those who are not teaching LCCS are often unsure about the effectiveness of AI content and students' interests, which may reflect a lack of

Table 1: The 6 AI related survey questions given to post primary computer science teachers (Experienced, Inexperienced and Other) and a summary of their responses.

	Q1. Do you believe the current AI education content at Leaving Certificate level prepares students well for future studies or careers in technology?				Q2. In your opinion, should the LCCS curriculum focus more on teaching how to use AI and understanding AI concepts?				Q3. Do you believe AI will become a more significant part of Computer Science education in the next 5 years?			
	Other	Inexp.	Exp.	All	Other	Inexp.	Exp.	All	None	Inexp.	Exp.	All
No	3	1	13	17	1	0	3	4	1	0	1	2
Unsure	9	2	5	16	2	0	5	7	0	0	3	3
Yes	0	1	7	8	9	4	17	30	11	4	21	36
All	12	4	25	41	12	4	25	41	12	4	25	41
	Q4.Have you seen a recent increase in students' career interests towards AI and related fields?				Q5. Have you integrated any real-world AI projects into your teaching?				Q6. Do you think professional development in AI is necessary for teachers teaching LCCS?			
	Other	Inexp.	Exp.	All	Other	Inexp.	Exp.	All	None	Inexp.	Exp.	All
No	2	0	5	7	11	4	18	33	0	0	1	1
Unsure	1	1	6	8	0	0	0	0	2	0	0	2
Yes	9	3	14	26	1	0	7	8	10	4	24	38
All	12	4	25	41	12	4	25	41	12	4	25	41

direct experience with the current curriculum. Across all groups, there is broad agreement that AI will play a more significant role in computer science education in the coming years. This analysis highlights the importance of experience in shaping opinions about AI in education and suggests a general trend towards increasing recognition of AI's future significance. The survey results indicate varying levels of confidence and preparedness among teachers regarding AI education in the LCCS curriculum. The need for more focused professional development emerges as a key theme, particularly as AI is expected to play an increasingly prominent role in education. Variations in responses might reflect differences in teaching experience, familiarity with AI concepts, and the availability of resources for integrating AI into the classroom.

Further analysis will explore these variations in greater detail. Building on these initial findings, the next phase of research will involve conducting focus groups and interviews with a select group of teachers to gain deeper insights into their perspectives. Additionally, we plan to expand our research by surveying students enrolled in the LCCS course, providing a comprehensive perspective that includes both educator and learner viewpoints. This will help align curricular content with the expectations and needs of all stakeholders, and help us to address our research question: *How can AI/ML content be suitably strengthened in the LCCS curriculum?*

Acknowledgments

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