

“I know when students need more practice”: Teachers’ use of genAI and learning analytics

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Abstract

There is a potential for interactive learning analytic dashboards. Embedded with agentic chatbots to support teacher practice and professional learning. However, the design of generative artificial intelligence (genAI) and learning analytic (LA) tools has tended to be disconnected from compulsory teaching contexts. The current pilot study, using an action research approach, investigates how six primary school teachers utilize a custom genAI pedagogical agent to support their practice and professional learning. Through thematic analysis of outputs and stimulated recall interviews, the research explores teachers’ contextual use of genAI and its relationship with learning data. Initial findings highlight the use of genAI, for both workload reduction and resource bricolage, but not lesson planning. Teachers were skeptical of the accuracy of the LA data. In both cases, they relied on the judgment of the teacher and the professional expertise over automated insights. These results underscore the necessity of human-centered design, suggesting that future agentic dashboards must move beyond keeping teachers “in the loop” to actively building upon their professional agency. This study informs the meaningful integration of AI and LA to better support educators.

Keywords

compulsory schooling, teacher practice, genAI, pedagogical agent, learning analytics

1. Introduction

There remain several questions around how best to combine and benefit from generative artificial intelligence (genAI) and learning analytics (LA), particularly in compulsory schooling [1]. Research into the use of LA in schooling has been limited due to issues of data quality, the ‘black box’ problem, data sovereignty, etc. [2]. As a result, the design of genAI and LA tools in schools has been disconnected from the teaching and learning contexts. There has been interest in the field to create more responsive and communicative LA dashboards (LADs) for users, which would include agentic and/or scaffolding chatbots [3]. Although much of the early work in this area has been done with students in mind, teachers would benefit significantly from these types of tools to support their practice. For example, LADs can help users with less data literacy navigate data visualizations, which is also a significant issue with teachers [4], and support inclusive educational practice, e.g. [3]. For teachers, this would potentially mean a dynamic use of learner data, with an embedded agentic agent space/LADs, with teacher judgment in the loop. However, to understand how to do this in a meaningful and human-centered way, we must have better data on how teachers’ decision making, contextual genAI and LA

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use come together.

2. Methods

In an effort to make LA more meaningful and impactful in teaching and learning, the field has been working towards a deeper consideration of teacher knowledge [2] and drawing on human-centered design principles to include educators' perspectives [5]. To address this, the current study has adopted an action research approach [6]. The research is led by Academy Trust leadership, schools and teachers to explore their questions about a pedagogical genAI agent, their own practice, and the future of these tools. As such, the objective of this pilot study is to investigate the use of a specific kind of genAI agent to support teacher practice and professional learning. In particular, teachers' practice specifically addressed other resources used in conjunction with the genAI agent, such as other digital technologies, learning and class data. This pilot study is intended to inform future design and development of pedagogical genAI agents for teachers, such as semi-agentic dashboards with teachers 'in the loop'. The research questions addressed are as follows:

1. What is teachers' use of a genAI pedagogical agent?
2. What is the relationship between pedagogical genAI agents and learning analytics?

Six primary school teachers from three schools participated in this six-month study. They used a custom ChatGPT 4.5 agent designed to bridge the gap between educational research (e.g., retrieval practice) and classroom application. The agent provided structured research summaries and recommendations based on teacher-selected strategies. Teachers could develop a strategy or identify their own. The agent returned a structured response, follow up questions were not structured. Teachers were free to use the agent as they wished. They return 21 outputs over two months. They also completed a short descriptive questionnaire on the use of chatbots and digital technologies. The results and outputs of the questionnaire were thematically analyzed and used in 60-minute stimulated recall interviews to better understand motivations and decision. The study is ongoing. The next stage includes additional outputs, two classroom observations, and a second interview. A data journeys approach [4] is implemented to track the output elements to teachers' practice.

3. Initial findings and discussion

Here, we present our early findings. To address research questions one, the initial interactions of teachers with the pedagogical agent were motivated by the desire to reduce the workload. Teachers reported use of the genAI agent (also ChatGPT, Copilot and TeachMeet) for writing reports, generating sentences for language learning, creating sets of Math problems, questions for book study, resources, etc.:

[I would do] I suppose tasks around school, as a class teacher, are required. You know, but it takes quite a bit of time, but does not really have that impact in the classroom... I don't want to say it is less priority, but it is just they are tasks that are there... there are other priorities. ...to manage workload. You do a lot of tasks in teaching outside of your actual teaching day... but they take kind of a lot of brainpower, and after a full day of teaching that is not always there... starting to write children's reports at the end of the year.

Teachers highlighted tasks that are typically considered 'teacher work', rather than teaching and learning. Generally, these tasks would be lower priority but still important. However, these practices led to the use of genAI to support teaching, as they found relevance in this new practice:

So, it was much easier to say to AI tools: "Write me some sentences about this book," and then I can just pick the ones that are going to work. Rather than just sitting there at my computer trying to think, right? How do I get this sentence? How do I make a sentence?

So, it was kind of ease and workload. I only knew what I wanted to do with dual coding... And the information that as soon as I press that press that button of you know I want to explore dual coding, I mean and that is where the ideas started popping up after that.

Agent use could come from a teaching approach or curriculum. It was specific and pragmatic for select areas of need that teachers had identified for their students, e.g. [7], which could be quite targeted or more exploratory, but always with a specific outcome expected. To address research question two, even if teachers were brainstorming a new learning sequence, they would use the pedagogical agent to create specific resources, but not whole lessons. They would use these resources on the iPads, interactive whiteboard, or even printed out for the students or on the visualizer. This largely mirrors teaching practices of creating a bricolage from a range of existing texts and workbooks. Teachers felt that creating whole lessons was actually 'teaching', and that was their job. They felt creating whole lesson using a chatbot was 'problematic'.

They also had pragmatic views of data provided by other AI-enabled digital technologies, such as a Maths practice platform, in their practice. Generally, teachers agreed that this tool was good for independent practice, not to be used in a lesson. However, the resulting data were not trusted:

I full well know when [students] need more practise... I don't always know how accurate [the data] is. I think [about students] doing the maths on the iPads, and there's so much more room for error because they just make silly mistakes. Whereas, if I was to look through their workbooks, I feel like I get a true representation compared to when they do work on an iPad.

In the instance above, the teacher was not sure about the trustworthiness or quality of the data, but also did not feel it was entirely useful in their practice. Interesting was the data across the school, as it provided insights they felt they could not otherwise identify. This was done in conjunction with other observational data. To this point, teachers spoke at length about 'teacher judgement' when using AI-tools and the genAI agent:

In the job we can't get rid of teachers. They are the experts in the classroom and it is their teacher judgement of is this going to support our children.

The reflections signal teachers' reliance on their own professionalism and 'judgement', rather than data insights or a pedagogical agent. They see value in both tools, but only in collaboration with their own knowledge. This underscores the importance of human-centred design and the necessity of better understanding teachers' practices around these two technologies, to build integrated genAI and LA systems such as agentic dashboards.

4. Limitations, future research and conclusions

The initial findings of the current pilot study highlight the importance of teacher judgement in the design and use of pedagogical genAI agents. This is different from 'human judgement' where LA supports decision making e.g. [8]. The use of genAI in teachers' practice was supplemental, but highly specific and closely considered in relation to their teacher judgement. Dashboard learning analytics held the same position, in that it had value, but not on its own. The benefits of both genAI and LA were to inform what teachers considered 'their work'. The benefit of combining the two in a dynamic agentic agent space, or LADs, would be the affordance of resource specificity and guiding LA insights – that the teacher could then judge. Limitations on these findings and conclusions are the small sample size of the pilot study. While the study does look at actual genAI outputs, the reflections are self-reported. The next steps of this study will examine teachers' classroom practice, which will bring additional light into the role of these tools in learning. Findings suggest that for the design of agent spaces/LADs with agentic chatbots. These point to designs that are more than teachers 'in the loop' of decision making. Rather, the design of tools needs to actually build on teachers' judgement and how they do this. This is truly human-centred, rather than technology centred.

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6. Declaration on Generative AI

The author(s) have not employed any Generative AI tools.

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