



'They want You to Read Their Work': Teachers' and Students' Perspectives on the Use of AI for School Feedback

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Abstract

Providing feedback is time-consuming for teachers, but new Artificial Intelligence tools aim to reduce this burden and improve feedback quality. We asked teachers ($N=12$) to trial an AI tool for providing feedback on students' work. In semi-structured interviews they reflected on the positive and negative implications of such tools. In focus groups, secondary school students ($N=9$) also shared their views on the use of AI feedback tools. Results showed that teachers believed AI tools could save time and reduce subjectivity in the feedback process. However, they also shared concerns about these tools' potential impact on teacher-student relationships, their ability to meet individual students' needs, and a potential deskilling of the teaching workforce. Many of these views were largely echoed by students in our sample. We conclude that AI tools for feedback are promising but need further development, and should include teachers' and students' voices as key to this work.

Keywords Generative AI · Feedback and assessment · Learning environments · Teacher-student relationships · Individual needs · Deskilling

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1 Introduction

Receiving feedback information is one of the most powerful catalysts of learning. It affords opportunities for students to close the performance gap between where they currently are and where they should be, and to identify and understand where they are heading (Hattie, 2012; Wisniewski et al., 2020). Recognising this importance, over many decades educators and education researchers have devoted considerable attention to understanding what sorts of feedback information benefit learners most, in which contexts, and when is best to give it (Bangert-Drowns et al., 1991; Panadero & Lipnevich, 2022). Modern feedback research distinguishes *feedback information* (the comments or advice passed from teacher to student) from *feedback processes* (the interactions, cognitions, and behaviours that occur prior to, during, and after the exchange of feedback information), emphasising that the latter require proactive effort and responsibility on the part of the receiver as well as the giver (Nash & Winstone, 2017; Handley et al., 2011). But even though the mere giving of feedback information is only a narrow aspect of what we should consider effective feedback (Boud & Molloy, 2013), it remains the case that regularly producing and communicating this information for groups of diverse learners is a time-consuming task for teachers (OECD, 2018). This is further complicated by myriad other issues including the subjectivity of evaluative judgments (Nazaretsky et al., 2022; Ruiz-Primo & Li, 2013), correction fatigue (Felix & Webb, 2024), and assessment bias (Bonefeld & Dickhauser, 2018; Doyle et al., 2023). Finding ways to support teachers with effective and accurate feedback processes should therefore be of great importance to school leaders, policymakers, and to teachers themselves.

The cumulative time that teachers are required to spend on marking and feedback activities is often considered excessive, leading to concerted efforts in recent years to reduce this particular workload (e.g., Independent Teacher Workload Review Group, 2016). Estimates suggest that teachers in primary, secondary, and special schools in England spend an average of over 6 h per week on marking (Department for Education, 2019)—equivalent to more than an entire day's worth of teaching—and almost half of teachers feel they spend too much time doing it (Department for Education, 2024a). Despite the importance and value of feedback to students' learning, there are good reasons to be concerned about this excessive assessment workload on teachers. Recruitment and retention in education are challenges internationally (See et al., 2023), with workload being one of the main reasons why teachers consider leaving the profession (Räsänen et al., 2020). In England, 94% of those considering leaving the profession cite workload as a major factor (Department for Education, 2024a), describing it as “‘unsustainable’, ‘insane’, ‘unrealistic’ and ‘extreme’” (Perryman & Clavert, 2020, p.15). Importantly, whereas greater teacher workload is associated with modestly poorer workplace wellbeing, research tells us that this is especially so in the case of marking and feedback workload. In one study, spending one extra hour per week on marking was associated with a larger negative impact on teachers' wellbeing than spending four extra hours per week on direct teaching (Jerrim & Sims, 2021). In short, we might reasonably expect that reducing teachers' workload in the specific domain of marking and feedback would be an especially valuable means of improving their wellbeing and job satisfaction.

There is a groundswell of support for teachers reducing their marking workload by finding alternatives to giving frequent individualised feedback information to students (Fletcher-Wood, 2017). In contrast, giving the same quantity of feedback information *more*

economically is a risky proposition, insofar that doing so could, in principle, harm the quality, accuracy, or consistency of the information given. Indeed, even in the current landscape of high marking workloads, concerns exist about the highly subjective nature of marking, with evaluative judgements often varying from one teacher to the next (Nazaretsky et al., 2022; Ruiz-Primo & Li, 2013). Moreover, research tells us that teachers' judgements of students' work can be influenced systematically by their knowledge of irrelevant aspects of the student's identity, such as their socioeconomic or ethnic background (Bonefeld & Dickhauser, 2018; Doyle et al., 2023; Harber, 2023), as well as by the teacher's emotional state, and the level of cognitive strain they are experiencing at the time of giving the feedback (Doyle et al., 2024; Brackett et al., 2013). Such findings raise concerns about the equitable treatment and standards of feedback afforded to students, and suggest that any efforts to reduce the time teachers spend on feedback would need to carefully take the complexities of these processes into account.

1.1 Artificial Intelligence Tools for Feedback

Increasing discussions around the use of artificial intelligence (AI) in education have pointed towards its potential to bring about radical changes by helping teachers to save time, increase efficiency, and strengthen their practice (Kim et al., 2020; Wang et al., 2024; Zhang & Tur, 2023). As governments around the world invest millions of pounds into further research, development, and training in the area (Department for Education, 2025), there come growing expectations for teachers to implement such tools in their practice. Accordingly, one potential means of both reducing teachers' marking workloads and maintaining or improving standards is to harness new AI technology to support teachers in generating feedback information on students' work. In recent years a range of AI tools have been developed, with the promise of producing accurate and helpful feedback much more quickly than it takes teachers to provide equivalent feedback manually. Such promises have garnered great interest and it has been estimated that, if implemented successfully, AI tools could save the average teacher around 3 h of marking time per week (Bryant et al., 2020), increase perceptions of fairness in assessment (Chai et al., 2024), and even improve students' performance (Cavalcanti et al., 2021). Nonetheless, most research in this area has focused on higher education contexts (Lee, 2023) and has often highlighted concerns relating to feedback reliability (Aloisi, 2023; Li et al., 2023). Further, the voices of teachers and students in research about AI feedback tools have so far largely been overlooked.

More broadly, research has highlighted trust and ethical considerations (Akgun & Greenhow, 2022; Nazaretsky et al., 2022) relating to AI use in schools. These include privacy concerns for students and educators due to the sharing of personal details, surveillance of personal preferences and activities, and the perpetuation of societal biases and discrimination arising from models that are trained on pre-existing biased data (Akgun & Goodhow, 2022). Moreover, many teachers still have limited knowledge about AI (Chounta et al., 2022), and may be put off using it in their classrooms if it is not perceived to be useful, useable, and trustworthy (Choi et al., 2023; Department for Education, 2023, 2024b). To complement research into the opportunities afforded by AI feedback tools, there is therefore still much to learn about teachers' and students' perceptions of risk associated with the use of these tools in schools.

1.2 Possible Risks of Using AI Tools for Feedback

Most research about using AI tools for feedback focuses heavily on technical aspects rather than on pedagogical models for best practice (Cavalcanti et al., 2021). In particular, much of this existing research explores matters of system accuracy, precision, trustworthiness, and the agreement between AI and human markers (Chounta et al., 2022; Lee, 2023; Nazaretsky et al., 2022; Wang et al., 2024). For example, AI tools sometimes produce ‘hallucinations’ (factually incorrect answers; Jukiewicz, 2024; Scharaskin, 2023), often with an authoritative tone (Alier et al., 2024). AI tools may also struggle to distinguish between superficial concerns in students’ writing (e.g., missing letters) and important modifications, evaluating students differently for nearly identical answers (Aloisi, 2023). Such errors can lead to the perception of unfairness and undermine students’ trust in educational systems (Aloisi, 2023; Felix, 2020; Gill et al., 2024; Li et al., 2023), and we know that many teachers themselves have concerns about the accuracy of AI tools in these respects (Abouammoh et al., 2023; Chounta et al., 2022; Riyadini & Triastuti, 2023). Whereas risks pertaining to the reliability of feedback *information* are doubtless important, it is also important to also consider the possible risks of AI tools for feedback *processes*, in particular what the implementation of such tools may mean for the interpersonal interactions and relationships between teachers and their students.

1.3 Teacher-Student Relationships

Positive teacher-student relationships (TSRs) are associated with a broad range of advantageous outcomes for students, including improved academic achievement (Gehlbach et al., 2016; Hajovsky et al., 2017; Mason et al., 2017; Roorda et al., 2017), increased societal involvement (Wanders et al., 2020), and greater sense of belonging (Doyle et al., 2025; Ibrahim & El Zaatari, 2020). Additionally, positive TSRs can benefit teachers themselves, in terms of self-esteem and managing stress (Spilt et al., 2011). Much has been written about the relational aspects and roles of feedback in student learning (Dann, 2019; Heron et al., 2023) yet there is surprisingly little research evidence about the links between feedback and TSRs in school contexts, and even less is known about how the use of AI feedback tools might influence these relationships.

On the one hand, AI feedback tools might help to overcome some of the issues surrounding teacher bias and student mistrust that negatively impact TSRs. Indeed, teacher assessment processes can disadvantage students from certain backgrounds (Doyle et al., 2023, 2024) and even ambiguous feedback can lead students from negatively stereotyped backgrounds to lose trust in their teachers (Cohen et al., 1999; Yeager et al., 2014). On the other hand, AI feedback tools may remove a key aspect of this social tie, given that the act of providing feedback information can strengthen students’ perceived bonds with their teachers, particularly when that feedback information is positive and focuses on effort and successes (Burnett, 2002; Guilherme, 2019; Skipper & Douglas, 2015). According to self-determination theory, students need to experience feelings of competence, autonomy, and relatedness for their psychological wellbeing (Deci & Ryan, 2000); however, Bulger (2016) contends that receiving feedback via technology may make students focus more on their performance goals, potentially to the detriment of their sense of relatedness with their teacher. Indeed, in one recent study, working with both an AI chatbot and a teacher’s sup-

port met students' relatedness needs better than did working with the AI chatbot alone (Chiu et al., 2023). In short, concerns arise about whether dependence on AI tools may impede rather than facilitate TSRs and subsequent learning. We need to understand more about the implications of AI use for feedback on TSRs, and if there are ways in which teachers may effectively use AI to support TSRs. These relational aspects of feedback were among the key issues explored in depth in the present study.

1.4 The Present Study

Teachers should be at the heart of discussions about these issues, yet with a few notable exceptions on AI in education broadly (Department for Education, 2023; Gocen & Aydemir, 2020), their perspectives have often been overlooked (Celik et al., 2022). Students also play an integral role in the feedback cycle (Nash & Winstone, 2017), suggesting that their views too should be used to inform provision (Gaertner, 2014), but they are infrequently called upon to contribute to such discussions. As such, there is a dearth of research specifically exploring teachers' and students' perceptions of the practical, pedagogical, psychological, and social considerations of using AI for generating feedback information.

This qualitative study draws on a project involving Faculty and the UK Department for Education. We used semi-structured interviews with teachers and small focus group discussions with students to explore their perspectives about the use of AI for generating feedback information for students after having the opportunity to trial a demo tool. Although we were keen to engage with teachers with a range of prior AI-experience, we aimed to primarily consult teachers who had minimal experience of using AI in their roles. This focus reflects that, at the time the study was carried out, the majority of the teaching workforce in England currently had limited experience with AI (Fletcher-Wood, 2023). Our teacher interviews and student focus group discussions focused, in particular, on perceived opportunities and risks presented by the use of AI tools for feedback purposes.

2 Method

2.1 Participants

Teachers ($N=12$) from nine schools in England were recruited in January and February 2024 via senior school leaders within the research team's national network. To gain a clear picture of how so-called "later adopters" of AI tools would feel about using them in the classroom, we used convenience sampling to recruit mainly teachers with little to no previous experience with AI. Teachers had an average of 16 years of experience and worked in diverse school settings (for full details, see Table S1 in the supplementary materials).

Students ($N=9$) aged 13–17 years, from two secondary schools, were recruited via communication with their headteachers to take part in one of two online focus group discussions of their perspectives on teachers' use of AI for feedback. We opted to speak only to secondary-aged rather than primary-aged students as they were considered more likely to have been exposed to AI—given the age restrictions placed on common tools such as ChatGPT—thus enabling rich discussions on the topic.

2.2 Materials and Procedure

2.2.1 Teacher Interviews

Each semi-structured teacher interview was carried out by one of three members of the research team. To stimulate participants' contributions, we gave them opportunities in advance to trial—or otherwise learn about—a new demo tool. This demo tool was developed by Faculty as part of a project led by the Department for Education, as a 'Proof of Concept' for supporting teachers in providing feedback information to students: in this instance feedback focused specifically on the spelling, punctuation, grammar, and vocabulary of Year 4 pupils' (type) written work, and produced a personalised study activity for pupils that targeted a key area for their improvement. Whereas the demo tool was only trained to provide feedback on Year 4 students' work, its general format was applicable to teachers and students across all age phases. Our focus for the current project was on the rich discussions about AI in education that stemmed from teachers' exposure to the demo tool, rather than on the functionalities of the tool itself (see Department for Education, 2024b, 2024c for more detailed information about the design and user testing of the tool).

Teachers who agreed to participate in this research were invited to trial the AI demo tool before taking part in a 45-min online one-to-one interview. Teachers were sent a link to access the tool described above, and a 5-min video tutorial for how to use it. There were no specific expectations for how long teachers should spend trialling the tool, but they all had at least 24 h between gaining access and taking part in the interviews. At the start of each interview, interviewers made clear that despite working on a project about AI in education, they had no particular agenda beyond giving teachers a voice on the subject. Teachers reported varied levels of engagement with the demo tool prior to their interview, and in four cases where they had not viewed it at all, the interviewer prefaced the interview by giving the teacher a demonstration of the tool remotely, during which the teachers were fully engaged and able to ask questions about its functionalities.

2.2.2 Student Focus Groups

Student participants were presented with a verbal description of the AI demo tool only, along with an account of how teachers might use it. Following this introduction, the researcher led a discussion about how students would feel about receiving AI-generated feedback, as well as their thoughts on how useful and appropriate this feedback would be for different teaching styles, learning needs, and different subjects. Students also had the chance to discuss the perceived risks and opportunities associated with implementing tools like this in their school.

All interviews and focus groups were recorded and transcribed in Microsoft Teams, before being checked manually by the research team to remove identifying information and to correct inaccuracies in the automated transcription.

2.3 Data Analysis

Two of the lead researchers plus two additional research assistants thematically analysed the transcripts (Braun & Clarke, 2006) in an iterative process, using NVivo software. Initially,

the interviews were coded by the lead researchers who used an inductive approach to identify overarching themes in the data. The coders used latent thematic analysis, looking for underlying meanings of participants' words, and were guided by a constructionist epistemological position (Braun & Clarke, 2006). All four coders then met to discuss and refine the codes in two sessions, before each time returning to the data and recoding in NVivo. As a means of gathering feedback on our interpretations of the data, we shared emerging findings with teacher education experts within our organisation. This iterative process of coding and discussion resulted in several key themes and sub-themes that are detailed below.

2.4 Ethical Considerations

Ethical approval for the study was granted by the National Institute of Teaching's ethical review board. Teachers received an information sheet and opportunities to ask questions, and written consent was provided both by the participating teachers themselves and by a senior leader in their schools. For students, headteachers provided written consent for their participation, and parents/carers were also informed of the study's aims and methods and given an opportunity to opt-out on behalf of their children. Prior to the discussions, students themselves were presented with information about the study by the researcher and were offered the chance to either withdraw or to provide verbal assent to take part. For safeguarding purposes, students were joined in the (physical) room by a member of their schools' staff for the online discussion.

3 Results

3.1 Teachers' Perceptions of AI in Education

Before considering teachers' views on the uses of AI for feedback in particular, we first contextualise their experiences by examining their attitudes towards AI in general. Despite the majority of participants describing themselves as neither knowledgeable nor confident users of AI, most—but not all—had experimented with AI previously in one or more aspects of their professional lives, including for report writing (Teacher 8), idea generation (Teacher 7), adapting learning tasks for individual needs (Teacher 6) and creating resources (Teacher 3). Moreover, some participants reported positive feelings about the increased implementation of AI in education, as for example, this teacher who saw AI as part of where education is going in the future:

“I'd be quite excited for it, to be honest [...] I think it could help an awful lot and I think that that's the way that we're going really in life and [...] I think that a lot of the national curriculum, particularly primary, is quite outdated in terms of the way that we do things. And I think that something like this could be a really big benefit to the children.” **Teacher 9, Primary**

Whereas most teachers in the sample had at least considered how they might use AI, some initially reported negative feelings and mistrust towards AI:

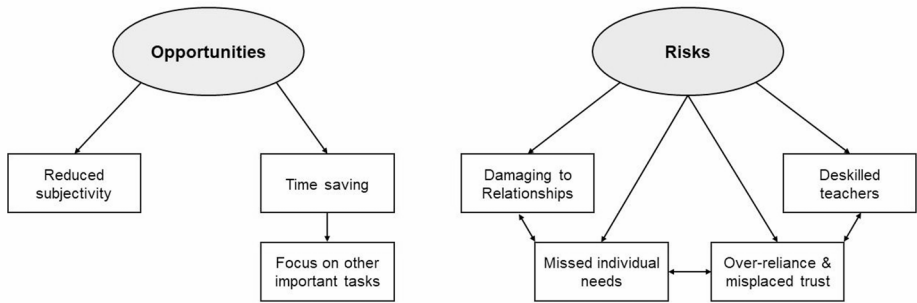


Fig. 1 Opportunities and risks associated with using AI tools for generating feedback (Previously published in Department for Education, 2024b)

"It's probably something I've kind of avoided [...] Yeah, I am someone that mistrusts technology in that way." **Teacher 5, Secondary**

Despite this hesitance, some teachers also reported that the uncertainty and intimidation surrounding AI were precisely what motivated them to learn more about it:

"One of the reasons why I'm quite interested in AI is because I'm also quite scared of AI and quite intimidated by it. So, I kind of want to understand a little bit, kind of get to grips with it." **Teacher 4, Secondary**

"I went on an AI webinar and I spoke with the head teacher and I said, 'We don't really know anything about this', I find it fascinating." **Teacher 6, All-through Special School**

As these quotations show, the teachers in our sample were generally open and receptive to AI, yet also viewed it with a degree of trepidation.

3.2 Teachers' Perceptions of Using AI for Feedback

Conversations about the demo tool sparked rich debates that provoked and challenged what it means to be a teacher, and these debates acted as starting points from which to address our main research aims. The themes identified from our analysis are summarised visually in Fig. 1.

3.3 Opportunities

Teachers and students discussed several key opportunities that they felt AI for feedback would offer. However, due to uncertainty about the accuracy of such tools, these were nuanced with reflections on how effectively AI tools would capitalise on these opportunities.

3.3.1 Reducing Subjectivity

Teachers described two main areas of opportunity that could arise from using AI feedback tools. The first was the potential for standardising outputs, thereby reducing subjectivity and inter-teacher discrepancies in judgements, and increasing the consistency and objectivity of feedback. This was mentioned by a small number of teachers in relation to moderation of work:

“Last year I went into a room with all the top teachers in [city]. They're all there, all Year 6 teachers, and discussing [...] every single text. No one was quite sure. Is it this level? Is that level? [...] If you want to create, you know, the AI, the formula for that, then it takes out all the subjectivity.” **Teacher 8, Primary**

“Moderation is hard because you're personally involved. So that's why, if you're a teacher, moderating your own work is completely different [...] You want to fight for that child, so that's why I think if you remove that [...] the AI system could be quite strong.” **Teacher 12, Digital Learning Lead across a MAT**

These quotes suggest that using AI to support feedback could help remove the subjectivity and bias from teachers own assessments (though see the Discussion for further consideration of this suggestion). In a similar vein, one teacher suggested that AI could effectively support inexperienced teachers with their uncertainties when working with a new year group:

“If there's a teacher moving to a new year group, having a tool that could then help them with where the mistakes are—what is expected for that particular year group [...] and you kind of lose some of those discrepancies between the teachers as well.” **Teacher 1, Primary**

However alongside discussing this as an important opportunity to strengthen practice, teachers also expressed doubts—particularly in cases where standardisation could be a limitation. At times, teachers expressed concerns that AI tools would struggle to detect and fairly evaluate nuances, flair, and unconventional answers:

“Sometimes students come up with an answer that isn't on the mark scheme, but actually works. How do you make sure that you know there is [...] that little bit of human interpretation into an answer and how do you make sure AI does that?” **Teacher 3, Secondary**

“A teacher is able to read a piece of writing and see if it flows and if it's got flair and that's how you tell who your more able writers are, and it's not necessarily because it's got perfect punctuation and grammar, it's the actual style that they write in.” **Teacher 9, Primary**

While these teachers' views may not necessarily reflect a full appreciation of the current state of AI tools, it is important that teachers believed capturing this nuance to be an essential aspect of good feedback.

3.3.2 Time Saving

Reflecting discussions raised elsewhere in this literature, the second key opportunity identified by some teachers was that, if implemented, AI feedback tools would potentially save teachers time on marking:

“In theory, a positive is that it's going to really speed up marking of [certain types of] questions.” **Teacher 5, Secondary**

It was also noted that the time teachers might save on a task such as feedback could then be reinvested into the learning process by supporting learners based on the feedback generated, and then teaching accordingly:

“It's the case of it saving you the time. So, then you can spend that time with analysing how to therefore take [their] journey to the next step. So the teachers' role becomes less of the assessor and more of the next step, the teaching again, it puts the onus back on track, doesn't it? OK, so the computer program's telling me that it's assessing you as this, so therefore I am a teacher and actually now I can teach you.” **Teacher 8, Primary**

Freeing up time, in this view, could therefore enable teachers to support students more effectively. Interestingly, this teacher—in contrast with the other participants—appeared to position being the ‘assessor’ as something separate to teaching (“actually now I can teach you”), as we explore below.

In our focus groups with students, they too identified time-saving as an opportunity arising from AI for feedback:

Researcher:

Are there any positives do you think [...] or is it purely negative?

Student 1:

I think it'd be easier for the teachers just to put it in, so then it's not so time consuming as they don't have to hand mark it.

Researcher:

And in what sense would that be positive for you as students ... if it saved the teachers' time, could you see any benefits for you in the classroom if that happened?

Student 1:

I think more content could be covered instead of just focusing on marking a particular piece of homework.

Student 2:

[AI] could have more thorough feedback. Because if the teacher's got 30 pieces mark in a couple days, then they might just try and rush through and get it done like quickly, so everyone's got something down

Student focus group 2, Years 9–12

The students here show an awareness of the time and marking workload pressures that teachers face, and that AI for feedback may be able to support with this and strengthen the quality of feedback. However, students also simultaneously expressed concern that AI-generated feedback may also have detrimental effects, as we return to below.

Some teachers also discussed how, if using AI did indeed save time, teachers may respond positively to this, due to the significance of workload and time issues:

“If [teachers] bought into it and they believed it would reduce workloads then [...] I think it would be something that people would embrace because in all schools it's a huge issue, isn't it? [...] marking workloads are huge” **Teacher 3, Secondary**

Some teachers and students therefore felt that there were opportunities to save time and strengthen practice using AI for feedback. These discussions emerged in light of the pressures on teachers' time and the acknowledgement that workload was a key concern. It is worth noting, however, that implicit in these hypothetical opportunities was the assumption that the AI tools would be accurate and reliable. To capitalise on the benefits of saving time and potentially strengthening practice, the tools would have to be effective. Some teachers expressed doubts that this would, in practice, genuinely save time, due to their lack of trust in the outputs.

“Researcher:

Would that save you time?

Participant:

It might save time, but I'm not convinced. I don't know. Because you still need to read it all through yourself to see what the AI has put, and whether or not it has focused on what you want it to focus on for that student as an individual.” **Teacher 2, Secondary**

“I think I would end up going back over and reading their essays anyway to see if the AI was correct.” **Teacher 3, Secondary**

These quotes highlight that for time-saving opportunities to be realised, teachers would first need to have confidence in the precision and accuracy of the tool. As such, while time-saving was perceived as an important potential opportunity for AI for feedback, this was also complex and entailed assumptions and risks. We now turn to examining these risks in more detail.

3.4 Risks

Aside from concerns about the functionality, sensitivity, and time-saving nature of the tools themselves, teachers also described a number of risks that could exist regardless of the tool's capacity to give precise, appropriate, and accurate feedback. We observed that they generally discussed these risks in greater depth than they did the opportunities.

3.4.1 Changing Role of the Teacher

Some teachers expressed concerns that using an AI tool for feedback would mean changing the role of the teacher and the learning process in significant ways. This theme arose frequently in interviews, with teachers reflecting on the centrality of their involvement in students' work for supporting the learning process:

“I don't think I could let it go in that way because these are my students and I should be the one giving them that feedback.” **Teacher 3, Secondary**

“It's our job to know their barriers to learning. It's our job to know how to deliver that feedback in a way that will actually ensure that the progress happens.” **Teacher 11, Primary Special School**

For some teachers, the prospect of delegating feedback tasks to an AI tool made them question what a teacher's role should be:

“Ultimately... What are they [teachers] in the classroom for? If they're able to, you know, submit that online to the teacher and then they'll just generate something and submit it back.” **Teacher 10, Secondary**

“You just think, well, if the students are writing it through AI and then we're marking it through AI, then the whole thing is pointless. Like what? None of us need to be engaging in this activity at all, It's an empty hollow exercise. If the students aren't doing the work and we're not doing the work, then what was the point of writing or setting that assignment?” **Teacher 2, Secondary**

In the latter quote, Teacher 2's worries around her own changing role are compounded by her fears around broader issues arising from students' AI (mis)use, thus presenting the risk, in her eyes, of making the entire assessment and feedback process redundant. Together, these responses suggest a degree of anxiety in the minds of teachers about what a future with AI tools would mean for their roles, and the centrality of teacher-student feedback to that role.

Discussions with students too suggested that interactions with the teacher are key to the learning process. Asking students how they would feel about receiving written work marked by AI provoked the following discussion:

“**Student 1**

...it couldn't give you that one to one feedback that you usually get from your teachers.

[...]

Student 2

You'll get the results sooner, but also you won't be able to actually talk about it or improve maybe

[...] You don't really get the space to improve and grow and stuff because everything is just like this is the answers—this is what you should give.”

Student focus group 1, Year 10

Here students weighed up the value of receiving work sooner with the importance of the discussion and space to 'improve and grow' through the 'one-to-one' with the teacher, which they saw as an important aspect to learning.

3.4.2 Over-Reliance and Deskilling Teachers

Teachers' concerns around changing roles also extended to the downstream consequences of AI use in the feedback process. One of these downstream risks highlighted by several teachers was that using AI for feedback could deskilling teachers, especially those who are new to the profession:

“It doesn't require any skills whatsoever from that teacher other than some basic ICT skills.” **Teacher 10, Secondary**

“I think my concern is you would have a lot of teachers that would just rely on that and they would actually lose their professional judgement [...] You could have, you know, [Early Career Teachers] that come into school and only use that and that's not going to develop them professionally.” **Teacher 11, Primary Special School**

“You need to be able to identify these errors yourself. You can't just be relying on technology all the time [...] My fear with that would be that you raise a generation of lazy teachers.” **Teacher 9, Primary**

These teachers' comments suggest that they believe their current, active roles in the feedback process facilitate their ability to make professional judgements, and that were AI tools to take on this work, they could quickly lose this competence, or—in the case of early career teachers—perhaps never develop such a competence in the first place. The fears of Teachers 9 and 11 about colleagues becoming over-reliant on such tools were echoed by many of the other teacher-participants. Indeed, whereas some (but not all) teachers reported that they would be likely to trust AI feedback tools, they also shared concerns that they and their colleagues could become lazy and excessively trusting of the technology, in part due to their unsustainable workloads:

“I think I could get quite too reliant on it if I had really positive experiences at the beginning, you know, because I have four Year 7 classes—that’s over 120 Year 7 students. I don’t have the time to go through every single test, right? What did they put for this question? What did they put for this? So, I think, you know, anything I can do to save my time—I’m all for it.”

[...]

“I think there could be a danger, as I said, like teachers getting a bit, you know, lazy [...] I think that I would get quite reliant on it.” **Teacher 4, Secondary**

“There’s the temptation, I guess, for somebody [...] to not actually really have a proper look at it and see what they’ve done well and what they’ve not done well.” **Teacher 10, Secondary**

Teacher 10’s concern about losing track of students’ learning progress was shared by many of the teachers:

“I know that obviously the whole point of AI is to take that job away from me, but as a teacher, I think that’s quite an important part, and I’d worry that somehow AI would lose the sort of nuance of what the kids should be doing.” **Teacher 3, Secondary**

These concerns act as a reminder of the central role of the teacher in the feedback and learning process, and of the perceived necessity of keeping a teacher involved to track and understand students’ progress, capture the nuances of their work, and ensure that feedback is appropriate. However, the quotes above also highlight that the pressures of teachers’ competing demands could result in them putting too much faith in AI tools if they promise to save time.

3.4.3 Teacher-Student Relationships and Individual Needs

In addition to teachers’ worries about losing track of their students’ learning and progress, many teachers expressed concern that handing feedback over to AI would undermine a critical, intrinsic aspect of the teacher-student relationship. Specifically, some teachers noted that the acts of work submission, feedback, and response to feedback are parts of an important assessment cycle between student and teacher; one in which the student forges personal connections with their teacher, thus helping the teacher to better understand their needs as a learner:

“It’s about building relationships with those students, isn’t it? And being able to say, well, I found this piece of writing really interesting, and I really liked that example [...] If I’m asking a computer to do that for me, then I won’t necessarily ever know about those things. So I would lose that kind of rapport, I suppose, to some extent with the kids and that kind of ongoing conversation that is there.” **Teacher 3, Secondary**

"I think the downside for me personally is I don't think I'd get to know my students and their quirks as effectively" **Teacher 5, Secondary**

Teachers, in these examples, express the view that the relationship is a key part of feedback working effectively, that knowing students is essential to the quality of the feedback, and that something essential about the teacher-student relationship would be at risk if they did not play a central role. Further, some also felt that losing this might threaten students' motivation:

"What I find really problematic about using AI to mark a students' work is that there is no relationship in that and so many students want you to read their work because this isn't just about them producing a piece of quality work [...] If they thought that you were just going to run that through an AI marker, I think their investment in that is gone. They want you to read their work. They want you to know and understand who they are as an individual. They want to impress you often. They want to interest you in who they are." **Teacher 2, Secondary**

Indeed, one student described the sense of demotivation that might arise for them from knowing that their teacher would not review their work:

"And demotivation from that—that no one's ever going to check it. And also, it doesn't show the teacher [...] [It] doesn't matter if you're improving or not when you're like learning good stuff like that." **Student 1, Focus Group 1**

In short, this quote substantiates teachers' concerns that a student's motivation to complete their work to a high standard could be diminished if they are aware that it will not be read by a human marker; thus, once again highlighting the importance of a teacher being central to the feedback process. These sentiments resonate with the conception of feedback as an inherently relational process, rather than the mere transmission of information (Boud & Molloy, 2013), and they underscore teachers' understanding of feedback processes as having motives beyond merely the academic, with socio-emotional consequences. Further, the risk of demotivation that both teachers and students discussed if teachers were not giving personalised feedback, points to the importance of students being recognised in their efforts. This student's comment that 'it doesn't matter if you're improving or not' if 'no one's ever going to check it', points to the fundamentally interactional nature of learning, and suggests the potential risk of broader demotivation for students if teachers are not closely involved in their learning.

In a similar vein, some teachers expressed the importance of knowing one's students not only academically but also interpersonally when providing feedback.

"You still need to read it all through yourself to see what the AI has put, and whether or not it has focused on what you want it to focus on for that student as an individual learner." **Teacher 2, Secondary**

This sentiment was echoed by several students:

“AI wouldn't know [...] the way you learn like a teacher would [...] unless there was a way where you could tell it beforehand.” **Student 2, Focus Group 2**

“The artificial intelligence won't ever really be able to match how a teacher has known you through the class.” **Student 4, Focus Group 2**

These concerns highlight the need for teachers' involvement in the AI feedback process to ensure that outputs are appropriate not just in terms of accuracy, but also in terms of relevance for the individual learner and their identified needs. However, two teachers from our sample who worked in special educational settings both suggested that even such mitigations might not make AI-generated feedback suitable for many of their students:

“There are a lot of other issues that we need to take into consideration for our pupils whenever we are doing any learning. You could have someone who gets really thrown by any negative marks on their paper rather than a verbal [feedback] or there are people who don't like verbal feedback. So it's all individualised that way.” **Teacher 6, All-though Special School**

“They never read it. They never respond to it. The feedback needs to be immediate. You know, in the lesson, not after, and especially in a special school because they don't really have the capacity to go back and reflect. And also, if there's something that they found particularly tricky and you're asking them to reflect upon it, you could actually trigger behaviour.” **Teacher 11, Primary Special School**

Both of these teachers describe the importance of carefully individualised feedback, and Teacher 11 perceived that written feedback produced by AI would likely be inaccessible for many of her students. These quotes further underscore the perceived importance of having teachers closely involved in the feedback process, who understand their students on a social, academic, and behavioural level.

In sum, many teachers in our sample shared concerns that AI feedback tools may pose a degree of risk to the learning process. Their concerns included potentially diminishing the role of the teacher, endangering the bonds and mutual understandings that develop between student and teacher, and risking the usefulness of feedback for individualised students. Reducing teachers' role in this process was also seen as a potential risk for demotivation for students.

4 Discussion

In this study we offered teachers the opportunity to trial a demo AI feedback tool before sharing their views about the implications of using AI tools for feedback for their professional practice. We also garnered students' views on the prospect of teachers using AI tools for these purposes. These rich discussions yielded areas of promise and key concerns to be accounted for in future decisions about using AI feedback tools. But they also shed light on participants' shared understanding of feedback as being more than merely an academic process, and as having social and behavioural consequences in the classroom.

In terms of opportunities, both teachers' and students' perceptions largely reflected wider discourses around the benefits of AI (Zhang & Tur, 2023). Specifically, some teachers and students alike noted that AI feedback tools could save time on marking, which might then be reinvested into other aspects of learning. The potential impact on the profession of a reduced workload cannot be understated, yet, because a large proportion of teachers already work beyond their contracted hours (NFER, 2024), school leaders must ensure that any time saved through the use of AI feedback tools is not simply reallocated to other work-tasks. By contrast, some teachers doubted that such tools would genuinely save them time, given their concerns about the trustworthiness and personalisation of outputs. Another perceived opportunity to arise during our interviews was the prospect of reducing subjectivity. Some teachers saw the potential for AI tools to remove the uncertainty and inter-teacher discrepancies that exist when marking and moderating work, thereby potentially making the feedback process fairer for students. Although a reduction in subjectivity could, in turn, help mitigate issues of bias in teacher feedback practices (Chai et al., 2024), some experts have expressed concerns that AI tools themselves could introduce systematic biases into assessment processes (Cheuk, 2021; Schiff, 2021). Indeed, research has shown gender and racial biases to be found in AI outputs (Akgun & Greenhow, 2022), suggesting that further research is required to truly understand the role of AI in promoting equity.

In line with previous research, our interviews highlighted that teachers may be discouraged from using AI in their classrooms unless they perceive it as reliable, useable, and trustworthy (Choi et al., 2023; Department for Education, 2023, 2024b). While the development of AI tools should prioritise a focus on the concerns teachers raise, teachers may also need to be supported to become familiar with the current and potential capabilities of AI tools, in order to build confidence and trust in these tools. In order to realise the opportunities presented by AI for feedback, tools therefore need to both *be* reliable and trustworthy, and also be *perceived* as such by teachers.

Our findings also highlight teachers' perceived risks, including slipping professional standards and the interpersonal risks associated with removing human elements from feedback processes. Teachers questioned how their roles would change in an era of AI feedback, and they shared concerns about possible over-reliance on AI tools. Indeed, through the acts of producing and giving feedback information, teachers regularly exercise their professional judgements on what constitutes a 'good' response to an assigned task, about where and how a student can improve, and about how the teachers themselves could support this improvement. Our findings suggest that by diminishing their responsibility for providing feedback, some teachers fear they would become less skilled in making sound and reliable evaluative judgements without relying on AI (Karan & Angadi, 2024; see also Chin, 2020; Feathers, 2019; Fischer, 2023, for parallel concerns around AI assessment tools contributing to a de-skilling of students). Despite this concern, one teacher proposed that such tools could support new or inexperienced teachers' skill development, by aiding them to understand the level their students should be working at. In short, these concerns about de-skilling may centre more strongly around the removal of human involvement rather than around the use of AI per se; such concerns might therefore be heavily mitigated in contexts where AI is used to bolster rather than substitute human judgment. These findings suggest that further development work on AI tools is needed, and in a way that takes account of these concerns of teachers. Further, teachers will need to be convinced about the accuracy and meaningful contribution of such tools for their practice if they are to use them widely and with confi-

dence. To close this point, our findings support calls from UNESCO (2024) for policy-makers to review and (re)define teachers' roles and competencies in this fast-changing context.

The development and maintenance of strong teacher-student relationships (TSRs) is related to a range of positive outcomes for both students and teachers (Gehlbach et al., 2016; Spilt et al., 2011), making it therefore concerning that many of our teacher-participants perceived AI feedback tools as potentially detrimental to this relationship. Some teachers felt that by not being involved in the back-and-forth of the feedback cycle, they might sacrifice the interpersonal rapport that is fostered by reading and responding to students' work. These participants worried that removing the human link from this feedback process could be detrimental to students' motivation as they strive for feelings of relatedness (Deci & Ryan, 2000), and look to impress their teachers: a sentiment echoed by students, who agreed that they may become demotivated if they knew their teacher would not be the one reading their work. Moreover, the delegation of feedback tasks to AI risks diminishing the perceived sincerity of feedback messages, particularly among minoritized groups. For example, *wise* feedback—which delivers a critique of students' work along with a message indicating that the teacher believes in their potential to improve—has been shown to increase minoritized students' motivation to improve on their work and their trust in school (Cohen et al., 1999; Yeager et al., 2014). This kind of mentorship afforded in human-to-human interaction may not be perceived as sincerely when delivered by an algorithm that is unable to truly *know* a student.

It is possible that the academic subject in question would influence the extent to which AI feedback would threaten the teacher-student relationship (we might speculate that common assessment tasks in literacy or humanities have stronger TSR-building potential than do those typical in, say, maths). Nevertheless, our findings highlight relational factors as being intrinsic to the feedback process, and they thus highlight a current limitation in the research literature on AI-generated feedback, which has been concerned rather more heavily with feedback *information* than with feedback *processes*, and more heavily with matters of information accuracy and reliability than with social psychological matters such as relationship-building, rapport and trust. We propose that the relational aspects of teachers' use of AI feedback are an important and immediate priority for future research, matching the growing interest in relational aspects of *students'* use of AI (see Luo, 2024). Overall, when combined with concerns around over-reliance and deskilling of teachers, our findings point towards the perception that AI feedback tools must retain a 'human in the feedback loop,' whereby teachers remain active in engaging with and contributing to the provision of feedback information.

A further likely and necessary benefit of strong TSRs is that teachers gain an in-depth understanding of the social, behavioural, and academic needs of their individual students. Adapting provision to meet these individual needs is of great importance in both mainstream (George, 2005; Tomlinson et al., 2003) and special school settings (Rytivaara & Vehkakoski, 2015) to ensure that all students are appropriately supported. Personalising learning for all students can be challenging, and some have argued that AI tools are better positioned to meet individual needs (van der Vorst & Jellicic, 2019). However, teachers and students in our sample expressed concerns about AI tools' capacity to meet these individual needs adequately, and this was a particular concern for teachers working in special schools, who considered the type of written feedback afforded by existing AI tools inappropriate in their contexts. As such, any development of AI tools for feedback will need to be adapted

to different school contexts, and tools that offer different forms of feedback for different settings could be beneficial.

Further development work should take account of these concerns, and place teachers' perspectives at the heart of this work. Due to the centrality of the TSR, and the skill and knowledge required in giving good feedback, many of the teachers and students in this study felt that using AI for feedback could change something profound about the learning process. Future research and development work should therefore explore ways in which AI and teachers can work in conjunction, to save time and strengthen practice without endangering fundamental aspects of the learning process or interpersonal relations. These may include, for example, viewing AI tools for feedback not as a case of "all or nothing", but rather as tools for *supporting* teachers' judgements. Further, our findings suggest that such is the allure of saving time in the current educational context, teachers could become over-reliant and deskilled. There is also, therefore, a need to further explore how approaches to managing marking workloads and time-paucity can genuinely strengthen practice, and not detract from the most meaningful aspects of teacher-student feedback processes.

Although our findings do not explicitly speak to teachers' and students' ethical concerns around the use of AI in schools, there are several points to mention in relation to this area. Firstly, concerns around privacy and surveillance should be at the forefront of any tool development to assist with teacher feedback. Due to the ways in which AI systems ingest and share data, simply uploading students' work to public systems poses significant safeguarding and privacy issues. Secondly, as mentioned above, AI systems may perpetuate existing societal biases. Educators therefore require training on how to critically evaluate outputs (UNESCO, 2024) and, in turn, must educate their students on how to do so. Thirdly, schools and students may have unequal access to resources that enable them to harness the potential of AI, thereby feeding into broader debates about the digital divide (Goudeau et al., 2021; Easterbrook et al., 2022; van de Werfhorst et al., 2022). Benefits yielded from the use of AI in some schools may therefore serve to exacerbate existing inequalities in education. Finally, we argue that any truly ethical approach to AI implementation in education is one that considers the views of its principal users: teachers and students. Our current study includes these voices at the forefront and we recommend that future research does the same.

4.1 Strengths and Limitations

Three key strengths of this qualitative study's methodology warrant particular discussion, namely our inclusion of a small student sample, our sampling strategy, and our having enabled teachers to actively trial or otherwise experience an AI demo tool before taking part in their in-depth interviews. On the inclusion of student participants, these additional voices served to validate and triangulate several of the concerns raised by teachers, thus strengthening our confidence in the findings. These student voices are invaluable because the effectiveness of feedback processes depends heavily on the behaviour and responsiveness of the recipient (Nash & Winstone, 2017). Therefore, insofar that these teachers raised concerns about how students would react to AI-generated feedback, our findings are bolstered by having evidence from the student focus groups which corroborates those same concerns. As our study only captured a snapshot in time, we were unable to measure the downstream consequences of genuine AI use in schools. We recommend that future research investigate

how AI for feedback (and other purposes) affects students' motivation and learning in the long-run.

As the majority of teachers in England had yet to use AI in their classroom practice (Fletcher-Wood, 2023), our sampling plan aimed to reach teachers from a spread of geographic locations across England with relatively minimal prior experience of engaging with AI. This approach gave a voice to teachers who may not typically volunteer to be part of research on AI-related topics. However, because we recruited these teachers via correspondence with their schools' senior leaders, it is possible that schools which were better equipped for, or positive about, AI were more likely to encourage their teachers to take part. Most teacher-participants also worked in Multi-Academy Trusts, and in schools with lower-than-average proportions of students eligible for free school meals. Furthermore, all schools were rated either Good or Outstanding by Ofsted.¹ As the needs and priorities of schools in different contexts vary significantly, we recommend that future research explores these themes in larger samples with teachers from schools that are deemed inadequate or requiring improvement, those in areas of greater deprivation, and those not belonging to Multi-Academy Trusts. Moreover, all participating teachers had at least eight years' experience in the profession, meaning that we did not garner the views of teachers earlier in their careers; those teachers' voices may be especially important given that our more-experienced teacher-participants' frequently referenced concerns about the impacts of AI on newer teachers. A further important clarification is that due to actively attempting to engage teachers with relatively minimal experience with AI, teachers' views on the limitations of AI tools will not necessarily reflect the current state of AI capability. Regardless, teachers' perspectives are essential for highlighting the areas most important to consider when developing meaningful AI tools for use in the classroom.

On our use of an AI demo tool, this approach sets the study apart by ensuring that our participants had a tangible rather than hypothetical example of what AI feedback tools could be like to use, and which in turn yielded rich discussions about areas of optimism and concern. Of note, though, was that a minority of teachers were unable to independently engage with the tool before the interviews and were thus only given a walk-through of the demo tool via a screenshare. Equally, due to practical constraints, student-participants were given an explanation of the tool rather than a demo to physically trial. Although these mitigations afforded participants a clear understanding of the tool, future research using this method should pay close attention to the feasibility of getting stakeholders to trial tools, especially given the workload pressures that already exist within education.

Whereas these findings are not generalisable due to the qualitative approach and small sample size, they include rich evidence, which can be of greater importance than a large sample (Staller, 2021), and touch on issues that will likely be of interest and use for educators in other similar contexts. Our interpretation of the data has been enriched by clear themes resonating with prior literature, and the insights of a broader study team of experts in this area.

¹ Ofsted is the inspectorate body for schools in England. They provide each school with one of four overall ratings: Outstanding, Good, Requires Improvement, Inadequate. 90% of schools fall in the top two (most positive) ratings (Ofsted, 2024).

5 Conclusion

It seems inevitable that AI tools will become a familiar part of the teaching landscape over the coming years, and there are indeed many opportunities that such tools could afford to teachers and students. With good reason, much of the existing research in this area has examined the accuracy of AI tools, notably those that aim to provide judgements and feedback on students' work: after all, an inaccurate tool is of little use to teachers or students. Our findings suggest that AI tools for teacher feedback have promise, but highlight the importance of focusing on the potential impact on the feedback *process* as part of learning and teacher-student relationships as a whole. In sum, the results of our discussions with teachers and students indicate an important belief that the process of generating feedback serves more than administrative, academic functions: it can support teachers' skills in making sound professional judgements, help with monitoring where their students are in their learning, meet individual needs, and foster rapport and teacher-student relationships, whilst also motivating students to progress in their learning. Development of AI tools for teacher feedback should prioritise these aspects of the learning process, and ensure that their use supports and promotes these important aspects of a teacher's role.

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Declarations

Conflict of interest None of the authors report any conflict of interest.

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