Student perceptions of technology in assessment

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Abstract

The influence of the 'student voice' in education has been growing over recent years, yet still remains in its infancy within high-stakes summative assessment. Simultaneously, the use of technology in the classroom and beyond continues to be promoted (DfE, 2019), with many students now accustomed to various forms of technological pedagogy. As these changes begin to filter into the administration of assessments, it seems appropriate to ensure that the student voice is heard in this area and student perceptions of these changes are captured. This research focuses on students (n = 14; age 16–18 years) in England who have recently taken, or were due to take, high-stakes GCSE assessments in paper format. Through focus groups, we explore the students' perceptions of how educational technology such as on-screen examinations and artificial intelligence (AI) could be integrated into the assessment process. A thematic analysis of the transcribed data (Braun & Clarke, 2006) captured three main themes: student views on the use of on-screen assessments; the potential use of AI in assessments; and, due to the timing of the focus groups in June 2020, the impact of the Covid-19 school closures on learning and assessment. Further subthemes included the disparity in student experience and access to resources as well as the impact of technological limitations and subject suitability on the involvement of technology in high-stakes assessment.

Introduction

Over recent decades, there has been increased focus on the use of technology as a pedagogical tool (Wastiau, et al., 2013; Buckner & Kim, 2014; DfE, 2019), which has led to greater attention on its potential use within high-stakes assessment (Ridgway et al., 2004; Crisp & Shaw, 2020). The recent Covid-19 school closures of 2020 have also pushed technology to the fore of many educational agendas (Burgess & Sievertsen, 2020). The voices of key stakeholders in the assessment process can give useful insight into the impact of this shift towards technologically anchored practices. As students are the end users of such practices, their voice is particularly crucial. Previous literature, presented below, supports the prominent positioning of student voices in education and educational assessment, and highlights the impact technology can have on the overall student experience. However, it also illustrates that work that focuses specifically on student perceptions of the use of technology in summative assessments within compulsory education is still in its infancy. This exploratory, qualitative study aims to offer initial insight into this domain by engaging with students who are currently attending school or further education settings and explore their recent experiences of technology in education. Secondly, the study aims to gauge student views on how technology could be used in high-stakes assessment. Therefore, this paper looks to answer the following two research questions:

RQ1: What are students' experiences of using technology for learning and assessments?

RQ2: How do students perceive the potential use of technology in high-stakes assessments?

Background

Student voice in education

Over recent decades, increasing attention has been paid to the specific views and perspectives of young people regarding their education (Cook-Sather, 2006). The aim of gauging the 'student voice' within education and educational research is to ensure that students themselves can help shape their own learning and be agents of change within schools (Fielding, 2001). In the late 20th century, there were initial efforts to counter the traditional authoritative structure of education that often 'silenced' the voices of the student population (Erickson & Schultz, 1992). However, it became clear that allowing students to have a voice was only part of the solution for creating active student participation in educational processes. Brooker and Macdonald's (1999) paper on curriculum innovation in Australia, for example, highlighted that when gathering the views of young people, it is imperative to acknowledge how the student voice will be positioned within any subsequent discourse. The student voice may be heavily filtered before it is relayed to others, and there is a risk that the voice will not be 'heard' at all. To ensure that the input students provide is meaningful and actionable, there has been an emphasis on promoting action research projects within schools, with works such as Bell and Aldridge (2014) providing examples of projects and resources that can integrate the student voice into classroom and school decision making. Furthermore, Cook-Sather's (2020) review of the literature covers many examples of active student voice in classroom practice, educational research and the authorship of texts. The review concludes, however, that in order for the student voice to be meaningful, a sense of agency must be instilled, and students must be seen to have real influence over the processes they feed into.

Student voice in high-stakes assessment

Although the influence of the student voice in education is increasing, opportunities for students to be heard within the field of high-stakes educational assessment have been less frequent and are still emerging (Barrance & Elwood, 2018). The lack of progress in this area is discussed in Woods et al. (2019) with reference to the absence of a children's rights strategy within educational assessment. The authors argue that the various purposes of high-stakes assessments, namely as school and teacher accountability measures and for student selection, can hinder the role of student rights in this domain of education. The need for system-wide student feedback on assessments is proposed to ensure future developments in assessment are democratic and representative.

Although research focusing on students' views of high-stakes assessment is relatively limited, a review of literature by Aitken (2012) highlights the main themes found in work that focuses on student voice and the production of fair teacher-led assessments. Although many of these assessment contexts are formative in nature, the findings are of interest to those investigating summative assessment practices. Aitken's review incorporates anecdotes from test takers and includes student concerns around the time allocated for tests as well as the degree of choice offered to students in assessments. Literature around test directions and grading are also discussed as well as the accessibility of assessments for students with special educational

needs and disabilities (SEND). As with the review by Woods et al. (2019), Aitken promotes the importance of placing students at the centre of assessments and asserts that student voice engagement is crucial for fair assessment practice.

In Northern Ireland and Wales, recent empirical work has gauged student perceptions of high-stakes assessment at policy level (Barrance & Elwood, 2018). This work proposes that student voices offer considerable insight and should feed in to national decision making around assessment. Focus group and questionnaire data from students (aged 15-16 years), obtained during assessment reform, revealed that not only were the students keenly aware of the changes in policy, they also believed they should have been consulted prior to the reforms. Furthermore, many students perceived a politicisation of the reform process, with those in power making decisions motivated by political rather than educational ends. This engagement with and awareness of educational processes supports the notion that students are valuable stakeholders to consult with during assessment policy change.

Impact of technology on the student experience

Within the UK, there has been a drive towards an embedded use of technology in the classroom, with government proposals suggesting its use can reduce teacher workload and improve accessibility (DfE, 2019). However, there appear to be a number of factors that may impact the extent to which technology use is beneficial for students. In a two-year case study project tracking three teachers and their use of technology in the classroom, Prestridge's (2017) findings support past research in this area (Deaney et al., 2003) and suggest that the digital competency of the teacher continues to significantly impact student use of technology in the classroom. It was also suggested that teachers need to see that their pedagogical aims can be met through technology before they fully embrace its use. Further factors that could influence how students experience technology in school are highlighted by Picton (2019). In a survey examining teachers' use of technology to support literacy skills in the UK, teachers acknowledged an increase in student engagement when using technology. However, the limited resources available to teachers, especially in secondary schools, and limited access to suitable teacher training were both perceived as barriers to embedding technology in pedagogy. This exclusion from digital resources may have an impact on the technological skills of a particular student or cohort and subsequently affect their views on technology and its use in assessment.

Student voice and technology in education

The closure of schools and the cancellation of many exam series around the world during the 2020 Coronavirus pandemic has brought the concept of online teaching and learning to the fore across the education sector (Burgess & Siervertsen, 2020). Yet for decades prior to the pandemic, the use of technology in the classroom has been steadily growing, and research around how students perceive its impact has covered a range of contexts. For example, in their case study of middle/high-school students in the USA, Stefl-Mabry et al. (2010) gauged student views on overall ICT (information and communications technology) provision and use. The key themes from the data suggested that there was a disconnect between the quality of technology in school and at home, with schools deficient in necessary software and hardware. The study also concluded that students viewed their teachers as disengaged with technology and that the

students themselves needed to assist staff to ensure its use in schools. This finding is supported by focus group data from English secondary schools, collected by Deaney et al. (2003). Their study found that while students were engaged and enthusiastic about technology use in the classroom, they were also aware that it changed the teaching dynamic. Students reported that the skill and confidence of teachers could be negatively impacted by the presence of classroom ICT, with students often having to assist staff. If students are potentially driving the use of ICT in educational contexts, it would appear that integrating their views into related agendas and policy decisions is necessary to ensure technology use in schools is fit for purpose (Davies, 2011).

As well as general views on ICT, specific technological tools and devices have also been the focus of recent research. Coyne and McCoy (2020) qualitatively examined the use of tablet PCs in secondary classrooms in Ireland. Drawing on student focus group data, the authors conclude that while tablet use increases student engagement in lessons, a lack of resources and unreliable internet services are both potential barriers to the successful uses of tablets in the classroom. It is worth noting, however, that in higher education contexts, where resourcing is not seen as an issue, undergraduate students' use of mobile technology has resulted in learners being distracted and less engaged with the subject content (Heflin et al., 2017). Context may therefore play an important role in how learners perceive and engage with technology, and results may not be generalisable across settings.

With this in mind, previous literature examining student views of technology in educational assessment has been mainly limited to the higher education context. While work has covered topics such as the use of on-screen assessment (Ogange et al., 2018), on-screen feedback (Nix & Wyllie, 2011) and the use of AI in marking (Marcinkowski et al., 2020), the samples used have predominantly been restricted to undergraduate students. Opportunities for school-age students to feed into the discussions and research in this area are still needed.

Method

Participants

AQA has recently established a Student Advisory Group (SAG), comprising 15 students aged 15–18 years, to give students a voice in the exam system. The group meets four times a year. All students in the SAG were sent information sheets about the project (see Appendix A) and invited to participate in the study. Fourteen students (age 16-18 years; male = 6; female = 8) from the group agreed to take part and returned consent forms. The SAG includes students from a range of backgrounds including a spread of geographical regions, school types and ethnicity. There is an equal split between male and female members. All participants in the study had recently taken GCSE courses and had recently sat (or were due to sit) high-stakes assessments with AQA. Although there is a degree of heterogeneity within the sample, it is acknowledged that the group's size and the extra-curricular nature of SAG membership may limit the diversity of academic engagement and ability within the cohort.

Data collection

Data was collected through three online focus group sessions (administered via Zoom), with between three and five participants randomly allocated to each group. Three researchers from AQA conducted the focus groups using a set of semi-structured interview questions (see Appendix B for question schedule). An additional staff member from AQA was also present as an observer during each session. The interview questions were collated to reflect current literature on technology in assessment as well as other research strands being carried out within the awarding organisation. These included the use of on-screen assessments and the use of AI in marking. Due to the timing of the data collection, which took place during the Coronavirus pandemic in June 2020, questions were also included to capture the impact of the school closures on the participants' recent learning and their formative and summative assessment experiences. The focus group sessions lasted between 45 and 55 minutes, and each session was audio recorded and transcribed verbatim. The data was then anonymised by attributing each participant a letter for the purposes of reporting.

Data analysis

The data from the four focus groups were analysed using thematic analysis. Following Braun and Clarke's (2006) six steps of thematic analysis, an essentialist thematic description of the whole dataset was conducted. A deductive approach was adopted for the main themes, to allow for the broad topic of 'assessment technology' being covered during the focus groups and the subsequent different audiences for the areas discussed. This involved coding the data to fit within predetermined themes that reflected the question schedule. However, due to the exploratory nature of the study, a data-driven inductive approach was taken to analyse the data for subthemes. This generated semantic subthemes that reflected and summarised the explicit meanings within the data and identified broader patterns (Patton, 1990).

The process involved the researcher first familiarising themselves with the data through reading and re-reading the transcripts. A systematic coding of the entire data set was then carried out. These initial codes were collated with their relevant data and separated into their corresponding deductive themes. For the subthemes to emerge, the initial codes were split into potential broader themes. Recursive merging and renaming of subthemes was then completed to ensure they accurately reflected the data within them. The related data extracts were then checked against the themes, and a 'thematic map' was created to ensure that there was no overlap between the subthemes (Braun et al., 2019). Finally, suitable and convincing data extracts were chosen for each subtheme and these were written into a narrative set of results. This process was completed by the first author and sent to the second author to review.

Results

The results from the thematic analysis of the focus group data cover three main themes with associated subthemes, as presented in Figure 1. The three main themes reflect the question structure of the interview schedule: 1) student perceptions of onscreen and online assessment; 2) experiences of teaching and assessment during Covid-19 school closures; and 3) student perceptions of AI in marking. A narrative of the themes and subthemes and the associated data is provided below.

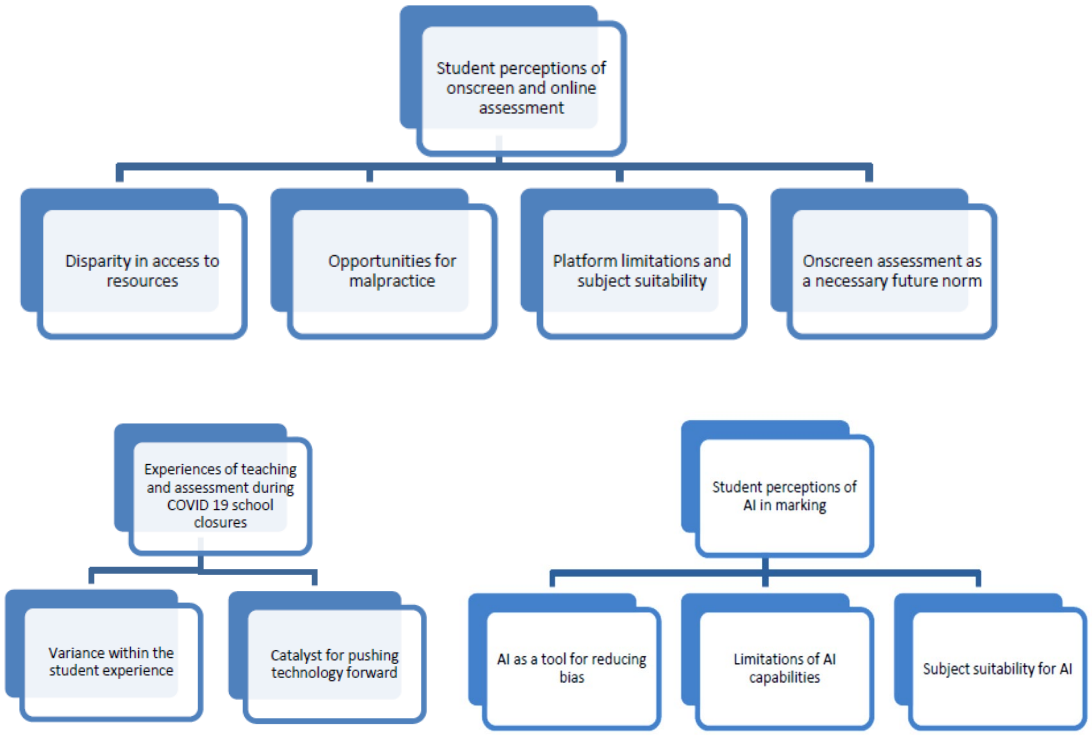

Figure 1 **A hierarchical representation of themes and subthemes from the focus group data**

Student perceptions of on-screen and online assessment

Each of the focus groups was asked a schedule of semi-structured questions that addressed their perceptions of on-screen assessment. A number of students within each group extrapolated this out to also include online assessment. The thematic analysis identified four subthemes: the disparity in access to resources; opportunities for malpractice; platform and subject suitability for on-screen/online assessment; and on-screen assessment as a necessary future norm.

Disparity in access to resources

Across the focus groups, students were aware that there was a lack of consistency in student experience regarding on-screen assessment. Home circumstances and access to technology were highlighted as potential sources of the disparity.

> I know I'm in a better position than others, because they don't have obviously computers and laptops and stuff like that at home, so I feel like it would be a lot harder for other people to get used to doing it online (Participant K – FG 3)

> I also think it depends on the access to technology, because you wouldn't really expect someone to take their A-level or GCSE on a phone, so if

> someone doesn't have access to a laptop or a computer (Participant E – FG 1)

Others were aware that the resources within schools may vary considerably and that time and financial support is needed prior to any change.

> For my school I think we would be absolutely equipped to give everyone a laptop for different exams and stuff like that, which is fine, but I know hundred percent that's not the case for every school at all, so I think while it's a good idea now, I don't think you could really put it into play in the next couple of years (Participant L – FG 2)

> I know in my school we don't have a lot of laptops, so it'd have to be, I don't know, in a few years maybe when, if schools are funded to buy all those laptops (Participant C – FG 2)

There was also a perception that such variation between schools and student circumstances could result in on-screen assessments contributing to further inequalities in the education system.

> One of my fears is that it's yet another tool that's going to widen the differences, not only between schools, but between students (Participant E – FG 2)

> The schools that are maybe private or have a bit more money to work with, you'd probably see more of them went digital than the state schools that might not be able to access technology to teach the kids to use technology in exams… so it could create a divide (Participant S – FG 3)

Opportunities for malpractice

A concern that was raised across the groups centred on the security of on-screen and, notably, online assessments. Opportunities for malpractice were perceived as a potential issue for the successful implementation of this technology in assessment. Students drew on their own experiences of online and on-screen assessments.

> They've been giving us questions, not exams as such, but questions. So for me I've had my computer there and I've got a Word document up, but then I've got my phone next to me which has got internet access on it, which I can just find the answers on it (Participant K – FG 3)

> We had to do the exam while Zooming them so they could make sure that we're not cheating, even though most people, well, everyone had their cameras off because they needed to look at the exam on Showbie as well. So you could potentially cheat (Participant V – FG 1)

They also discussed the potential scenarios that could be adopted for high-stakes assessments, including home- and school-based exams.

> If you're doing it online it's like how can you ensure that someone isn't on their phone or has notes with them? (Participant E – FG 1)

> There is definitely a higher ability to be able to cheat and to do that kind of thing by having this massive screen in front of you blocking it from vision. So if it was to be done, say, in an IT room or whatever…there'd definitely have to be some kind of consideration about the process of invigilating it (Participant E – FG 2)

Platform and subject suitability

All the focus groups discussed the different demands of certain subjects and the resources needed for their assessment. The platforms and software available for assessment prompted students to perceive some subjects as more suitable for on-screen assessment than others. Some students saw certain question types, such as multiple-choice questions and long-answer essay questions, as well suited to on-screen assessment.

> I think practically every exam I have seen has some sort of multiple choice involved and I think multiple choice questions in online format would be very useful. (Participant A – FG 1)

> I think subjects with long answers like English or history or something I think would lend themselves better. (Participant B – FG 3)

Some students also perceived the on-screen format as similar or preferable to paper-based formats.

> With the essays, because all my three subjects are essay-based…, if anything, it would probably be, I prefer typing, so it would actually be to my benefit doing it online (Participant E – FG 1)

> We have to be careful about our handwriting in essays. And if examiners can't read your handwriting they're not going to give you the mark…so that would help to level out that playing field and make sure it is equal in that sense (Participant E – FG 2)

Other participants, however, saw limitations for subjects that utilise non-standard keys, such as maths and some foreign languages.

> I know some of my friends do languages that don't use the Latin Roman alphabet, so that would be quite difficult. (Participant E – FG 2)

> It can be hard to type equations and stuff and use different symbols on the computer, like it just takes a really long time to type that stuff (Participant C – FG 2)

> For written subjects or perhaps like maths where there's symbols involved. I think it would be quite difficult in terms of the formatting of the exam, especially for maths and science (Participant V – FG 1)

It was also suggested that students would require considerable training in using these platforms if they were to be employed in high-stakes assessments. The techniques and skills required for using a computer to complete an exam were viewed as distinct from those needed in paper-based assessment; these skills would need to be practised and honed by students to ensure assessments were valid.

> I think if we were going to input online exams you'd need to be training kids how to answer questions in that format from year 7 (Participant E – FG 3)

On-screen assessment as a necessary future norm

Regardless of some of the potential barriers to using on-screen and online assessments, there was an expression of inevitability across the focus groups in the greater use of technology in the future. For some, it was seen as the natural evolution of the exam system.

> I feel like technology is definitely going to play a part and if you look back at O-levels, exams evolve over time. It's like when exams were mostly coursework, now they've shifted to quite examination-based. So I definitely think technology is going to play a part, it's just what part it's going to play (Participant E – FG 1)

Others felt that the current system needs to progress forward and that the use of on-screen assessment is an important and necessary part of that.

> I think the physical exam system is quite archaic. So I feel that a transition to online exams will only be beneficial for everyone involved. So it allows students to be tested on a more broader range of skills (Participant A – FG 1)

> I feel as though children who sit these exams now feel certain things they learn are outdated, maybe unnecessary to learn. I feel as though more introduction of technology and stuff could really benefit people moving forward, considering that is the way the world is going (Participant L – FG 2)

Some students also positioned on-screen assessment as an increasingly valid form of assessing school leavers. They suggested that the use of technology in both exams and non-exam assessment (NEA) should reflect the real world and better prepare young people for work or further study.

> Considering exams and stuff like this are preparing you for the future, the future's certainly through computers and technology, so I think going more on the computer and stuff is more realistic. It sets people up for the real world, that's where you'll use them when you're older, you'll have jobs and stuff like that (Participant L – FG 2)

> I also did the EPQ, the Extended Project online, as well, and I think the process of being able to write that out and to use tools to do the referencing and bibliography and stuff has been really useful in helping to prepare for

> what it's going to be like when we go into university or into work (Participant E – FG 2)

Reference to the Extended Project Qualification (EPQ) here also suggests that the mode of assessment may impact how suitable technology can be integrated; embedding technology in NEA may be an additional method for digitising summative assessments in compulsory education.

Experiences of teaching and assessment during Covid-19 school closures

The timing of the focus groups in June 2020 meant that the Covid-19 school closures were significantly impacting the experiences of many of the participants. The students often drew on their recent experiences in their responses. There were also some questions within the schedule that directly addressed these exceptional circumstances. Two subthemes were identified: variance within the student experience; and school closures acting as a catalyst for driving forward the use of technology in teaching and assessment.

Variance within the student experience

Within the sample of students, there was considerable variation in the amount and type of interaction that the students had had with their schools and the way progress had been monitored. The communication between schools and their students ranged from the total absence of any contact since the school closures, to a daily online timetable.

> My school since we finished we've just been left essentially, so we don't really get any work or anything… I don't think they've been able to do online lessons or things with the younger years either, because I don't think, our school doesn't seem to have the facilities to make sure all of them can reach a computer (Participant S – FG 3)

> I know a lot of people who've had a lot of online lessons, but my school haven't done online lessons. We've had Zoom calls with our teachers, but that's just like a general catch-up. (Participant F – FG 2)

> I've been taking online lessons this entire time. Because I've come to the end of my GCSE studies my school has actually been really proactive and planned out a pre A-level course for everyone in year 11 and they've actually made a whole timetable. So we've got an actual timetable that we follow every day. (Participant V – FG 1)

For those students receiving regular school contact, the resources and materials for teaching and assessment varied considerably in type and quantity.

> My school's moved to online school now so we're using Zoom and Showbie. I've been doing some of my English essays online as well… for general classwork, yeah, I've done some of that online and uploaded it over online platforms (Participant V – FG 1)

> For me it varies in different subjects, so some subjects that have been doing a lot, a lot of Google Meets and stuff and they've been really helpful… Obviously teachers are sending work out and stuff. Not everything gets marked obviously. You can send stuff back, you may not get a reply (Participant L – FG 2)

> During my online lessons teachers have sent out essay questions and I've typed up my answer, so in a way it's a rudimentary version of what would happen with an online test (Participant E – FG 1)

> At the start of every week they send like a really long email indicating all the different types of tasks that we need to complete for that week. And we have the opportunity to submit it in at the end of the week (Participant A – FG 1)

External factors also impacted the extent to which students themselves had been able to engage with the educational input on offer. For some, employment had been a barrier to their home studies.

> I know that some of the students at my sixth form, including myself, have been working as well, so I've only just reduced my hours. So I was working five days a week (Participant K – FG 3)

> I know some of my friends in year 12, a lot of them work on or live on farms, and it's been quite difficult for them to manage if they have any set online lessons, doing that and being able to persuade their parents that they don't have the ability to go out and help with the animals (Participant E – FG 2)

Catalyst for accelerating use of technology

Despite the many discrepancies and barriers to learning created by the school closures, some students perceived this as a time in which technology and skills have been pushed forward. This included some teachers adapting and gaining new skills.

> Obviously some of these teachers are a bit older as well, so they're not really used to this type of format and style. But they have been starting doing it now. They are getting better (Participant L – FG 2)

The creation of online resources opened up an alternative and more flexible way of working, which, although used in other contexts (i.e. higher education), appeared novel to the students.

> I think it's increased flexibility, as we've seen this year, for students to access these online resources or assessments any time when it's possible, so like on mobile phones and laptops. (Participant A – FG 1)

> In the school timetable schedule there's been lots of cases where lessons have overlapped and I can only go to one, but teachers record the lessons so you can go back. Which is useful and could be done in the future (Participant B – FG 3)

There was also some reflection on how the use of technology during the school closures could change perceptions within the education system and advance the implementation of online and on-screen resources and assessment.

> I think from what I can see it's definitely made people believe that it's more viable and a lot closer to our current exam system or educational system than we actually thought. Because it was quite easy to say ah in 20 years lessons will be online and the exams will be online, but now we can see it is possible to some extent, a lot more possible than we thought it was (Participant E – FG 2)

Student perceptions of the use of AI in marking

The interview schedule for the focus groups included specific questions about the use of AI in assessment and marking. It should be noted that while many students did appear to have a clear understanding of what AI involves, some were unsure; a definition was therefore provided to each group. Three subthemes emerged: AI as a tool for reducing bias; the limitations of AI capabilities; and subject suitability for AI marking.

AI as a tool for reducing bias

Across the focus groups, participants could see positive aspects to the introduction of AI, most notably in the form of standardising marks and offering an additional check to human markers. The notion that human markers had inevitable biases and limitations to their marking was raised.

> The examiner isn't going to mark the first exam they get the same way they'd mark the 400th exam they're marking as well, because they're humans, human error, different things come in, they're tired, they've seen it all before (Participant L – FG 2)

Some students were also aware of inconsistencies between human markers that they believe would be reduced by the use of AI.

> It feels like it would be fairer than having loads of different examiners mark, because everyone's being marked by the same standards, because different examiners, although they've had training, they'll all have personal biases and just different standards, so some will be much more harsh than others I'm sure (Participant B – FG 3)

> You could have one essay question and if you have two examiners marking it they're possibly going to have different opinions; whereas the AI will have the same opinion for both (Participant E – FG 1)

Other students positioned AI as a tool for checking human markers, to highlight those whose marking may not align with the majority.

> I think it would be interesting to see if you could use AI as more of perhaps like a second marker or a way of identifying inconsistent marks… perhaps

> if you use the knowledge from really experienced and senior markers then I think AI has huge potential in identifying those inconsistent markers (Participant A – FG 1)

> I think it would be good to check for consistency and then if there is something which is pointed out as being unfairly marked then someone higher up can remark it before the student gets the grade. (Participant C – FG 2)

Limitations of AI capabilities

However, many participants perceived limitations to the extent to which AI could be used in assessment. They expressed apprehension regarding the current technological capabilities of AI.

> I'm not sure if anything right now would be advanced enough to provide any serious benefit. Something like marking essays would require quite advanced natural language processing and then to be able to then apply that to the marking criteria for a humanities subject, I'm not sure if that would be feasible (Participant S – FG 2)

> I think at the moment it wouldn't be very reliable, I don't think the technology is advanced enough. (Participant C – FG 2)

They also raised concerns around removing the human element of marking, particularly in relation to the marking of abstract concepts.

> You're never going to replace an actual examiner with a human brain and everything by a computer, I just don't think you can get that depth of knowledge from a computer (Participant V – FG 1)

> If it's a certain level of abstract would the algorithm be able to account for that, if it's quite far afield but it's still a valid argument would AI still be able to verify that as a high level argument or would it mark it lower just because it doesn't fully understand (Participant S – FG 3)

The students identified potential issues with some practical elements of using AI in marking, including the cost and time to set it up: 'Of course AI it can cost and it takes a lot of time to get it right*' (Participant A – FG 1)*. It was also recognised that on-screen assessment would need to be implemented in order for AI to be effective.

> I'd also like to add that that would only really work if it was typed up. So if the assessment was on a computer, because with handwriting it might be more difficult to check the spelling and stuff via a computer (Participant C – FG 2)

Subject suitability for AI

For many students, the demands of the different subjects that could be marked by AI would impact the extent to which this technology would be effective. Some students could envision AI suitability for multiple-choice questions and subjects less reliant on extensive written answers.

> I think for maths and stuff like that where there is a right answer, there is a wrong answer, some chemistry questions, some biology questions where multiple choice is involved and stuff like that it would be really, really good, but for literacy-based subjects it wouldn't really be that much better (Participant K – FG 3)

AI was also viewed as beneficial in the checking of spelling, punctuation and grammar in essay-style answers.

> I feel like that [marking grammar] would be good I feel that would be one of the best places you could apply AI, because it's something that's never going to change and you don't need an opinion (Participant E – FG 1)

> I think having a balance between AI checking perhaps more menial things such as SPaG, I think that could be useful in allowing teachers to prioritise other elements of the mark scheme. (Participant A – FG 1)

However, as highlighted in the 'limitations of AI capabilities' subtheme, some participants were concerned that subjects that require an extended answer or argument would be less well suited to AI marking.

> I just think especially things like English lit some people have very abstract ways of interpreting a story…. would the algorithm be able to account for that? (Participant S – FG 3)

> Could AI really be able to mark some sort of a philosophy-type subject and stuff like that, really higher thinking with ideas and stuff like that, how would it be able to do it? (Participant L – FG 2)

Finally, there was also some apprehension around whether a lack of consistency in the use of AI across subjects could lead to a two-tiered system of assessment.

> There's some subjects which it just would not work, like I do A-level art for example, so my fear would be that if you were to have AI marking a whole bunch of different subjects and then only have humans marking photography or art and D&T and that kind of thing, there's going to be this level of disparity and divergence between the two (Participant E – FG TD)

Discussion

This exploratory study gauged student experiences and perceptions of the use of technology in educational assessments through the thematic analysis (Braun & Clarke, 2006) of focus group data. The results cover three main themes: student perceptions of on-screen and online

assessment; experiences of teaching and assessment during the Covid-19 school closures; and student perceptions of the use of AI in marking. The subthemes that emerged provide insight into the topics perceived as most pertinent for the study's sample of 14 students, all with recent experience of taking high-stakes assessments in England. These subthemes cover student concerns about the availability and access to resources as well as the capability of current technologies and the requirement for secure and reliable processes to support the use of technology.

The results of this study suggest that for many students, technology is viewed as an inevitable part of life both inside and outside of school. With a government drive to increase the use of technology in classrooms (DfE, 2019) and with 98% of young people (aged 16–24) having access to a smart phone (ONS, 2018), it is unsurprising that the current cohort of GCSE and A-level students view technology use not only as part of their lives now, but as an integral part of their future. However, students are also aware that the prevalence of technology in society does not seem to translate to consistent or equitable access to resources in education. This inconsistent access to digital facilities has been highlighted in previous research (Male & Burden, 2014), which identified a number of contributing factors including policy, finances and inequity. While the 2020 Covid-19 school closures may have accelerated the use of technological teaching tools (Burgess & Siervertsen, 2020) and forced many teachers to enhance their digital skills, the experiences of students within this study highlight how the pandemic has also brought to the fore a clear disparity in centre resources.

In the context of on-screen assessment, school/college and student access to suitable technological and digital resources appears to be a key component for successful implementation. With changes to education funding over recent years, including notable cuts to the further education sector (Kewin & Donhowe, 2017), the opportunities for state-funded schools and colleges to invest in additional ICT equipment may have been limited. Although organisations such as NAACE (Advancing education through ICT) and CAS (Computing at School) work to raise the profile of technological practices in education, it appears that for some students this has not resulted in the appropriate level of resource within their centres. The disparity between centres and, specifically, centre types, suggests that the introduction of on-screen assessments without the appropriate funding would introduce an additional source of inequity into the assessment system; a reliance on such technology for academic attainment has the potential to exacerbate socio-economic inequalities present within education (Nikolai & West, 2013; OECD, 2012).

In addition, the focus group results suggest that not only is the widespread availability of technology for the delivery of on-screen assessments viewed as deficient by students, there are also concerns about the capabilities of current technology. The technology required to implement AI for assessment marking is seen as underdeveloped. While some students could see the benefits of removing human marker bias through AI, a notion that supports previous work examining the views of undergraduate students (Marcinkowski et al., 2020), many students do not believe current technology is capable of responding to the more complex demands of marking. These perceptions of technological limitations appear to reflect current perspectives within educational assessment (Aloisi, 2020). Students in the study also suggested that only certain subjects or questions may be suited to on-screen assessment or the use of AI for marking. This supports recent work into mode effects in assessment and the

impact of item type in on-screen assessment performance (Buerger et al., 2019). The limitations of the current, available digital technology again appear to be seen by the students as a barrier to successful, consistent implementation of these tools. Significant technological developments, and the associated financial investment, may be required to ensure that such technology can be integrated into assessment processes efficiently and effectively.

Finally, many students within the study considered on-screen assessment to also include an online element. Due to the context of the data collection during 2020 school closures, some students also perceived this to mean that exams would be sat outside of a school or college setting. This led to some students expressing concerns over the security of taking high-stakes exams through such digital channels. The opportunities for malpractice by accessing materials on the internet or having notes available during an assessment were viewed as unacceptable by most students. Although many students could see benefits to on-screen examinations, this was only within the context of the school setting; off-site assessments were considered to be problematic. With education systems around the world responding to a continuously changing set of demands during a global pandemic (Burgess & Siervertsen, 2020), student concerns around the physical location of their assessments are relevant and should be considered as future assessment arrangements are prepared.

Conclusions

RQ1. *What are students' experiences of using technology for learning and assessments?*

The experiences of students within this exploratory study support previous literature (Male & Burden, 2014) and suggest that there is a wide variation in the use of and exposure to digital educational technologies for both pedagogy and assessment. The Covid-19 school closures of 2020 have highlighted to many students in the study that there is a lack of consistency in the resources available and this has the potential to introduce further inequity and inequality into the education system. While some students have good levels of access to various digital technologies in school and at home, for many this is not the case. Access to laptops or computer suites in school may be limited for many students, and some may not have reliable, consistent access to technology at home. Teachers' ICT skills also seem to play a role in the experience students have with technology, and while recent school closures have advanced teachers' use of technology, the need for sufficient teacher training in ICT is still necessary.

RQ2. *How do students perceive the potential use of technology in high-stakes assessments?*

Students in this study perceived a number of potential benefits with the introduction of digital assessment technologies. The removal of marker bias and human error were viewed as key benefits that would ensure assessments are fair and reliable. The assessment of students through a medium that reflects real-world use of technology was also viewed positively. However, limitations in current technological capabilities and disparate access to suitable equipment in schools were both seen as barriers that would prevent the successful implementation of digital methods of assessment. Many of the students felt that their school or college would be well equipped for the introduction of on-screen assessments; however, others knew that their centres may not have the necessary means. Across the focus groups, students

felt that schools with access to additional financial resources would be better prepared for the introduction of digital assessments.

Implications and future research

The influence of the student voice in education, and more recently in educational assessment, has been growing over recent years. This study provides initial insight into the way students who are currently taking high-stakes examinations experience technology in education and how they view its potential use in assessment. The benefits and concerns highlighted here can help to inform assessment organisations and those working with educational technology about the potential student response to digital assessments.

The study sampled a limited number of student voices to feed into an initial, exploratory study. While efforts were made by AQA to hear from a range of students when recruiting for the SAG, the authors acknowledge that larger, more representative samples are needed to add to the literature. The participants in this study recounted a variety of experiences that indicated the breadth of scope that could be considered within this field. More specified research that delves deeper into student views of certain areas of technology in assessment would be beneficial. Future work that empirically captures the student experience of technology and gauges perceptions on specific digital tools within assessment would also be valuable.

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Appendices

Appendix A: Participant information sheet

Student Perceptions of Technology in Assessment

Dear Student,

As part of the research work we do at AQA, we are looking into the ways technology could potentially be used in assessment. As part of this, we are interested in student views on and experiences of using technology in assessment situations.

How will AQA collect data?

To collect your views on how technology could be used in assessment, we will be running three focus groups online, via Zoom. These will be group interviews where you will be asked some questions by a researcher about different aspects of technology, such as the use of online/on-screen assessments. You will be asked about your views and can discuss the different topics in your groups. Your discussions will be audio recorded.

What will AQA do with the data?

The audio recordings will be transcribed and anonymised (so all names will be removed and no-one can identify who you are). We can then compare the transcripts from the different groups to see what themes emerge e.g. were there things the different groups all mentioned or had concerns about? This information could then be used to write reports for AQA and/or external audiences about student views on this topic.

What do you need to do?

You don't need to prepare anything for this. We want to gauge your opinions on using technology in assessments, so we just want you to speak openly about what you think. There are no right or wrong answers.

Participation in the project is voluntary. If you wish to withdraw from the project you can do so at any time without providing a reason for doing so.

If you have any questions before the focus groups, please contact:

Katy Finch

Researcher

Email: KXFinch@aqa.org.uk

Participant Consent Form

Research project: Students Perceptions of Technology in Assessment

If you would like to take part in the research, please fill in the box below:

I have read and understood the information sheet about the research study, please tick the box ☐

I _____ (your name) consent to taking part in the *Technology in Assessment* focus group project. I understand all data collected will be anonymised and any resultant reports will not identify specific individuals. I also understand I may withdraw from the research at any time without giving a reason for doing so.

Signature:_____

Date:

Researcher signature:_____

Date: _____

Appendix B: Focus group question schedule

Students' perceptions of Technology in Assessment

Intro:

Thank you everyone for joining the focus group today. We are going to be talking about the use of technology in assessment, with special reference to the changing and challenging times that we're in at the moment due to the Coronavirus. I will ask questions, but the session will be a group discussion where you can give your views and opinions on this topic. There are no right or wrong answers; we just want to know what you think.

We are going to be audio-recording the session today, and the recording will be transcribed and anonymised so no one can identify who you are. Could you all let me know whether you are happy with this?

Does anyone have any questions before we start?

OK, so first of all could we just go around the group and briefly introduce ourselves. If you could maybe say your age and the subjects/qualifications you study and anything else you want to say.

<Introduce yourself>

<Prompt students, if necessary>

5 minutes

So the first thing we are going to talk about today is the use of on-screen assessments, so assessments like exams, tests or practicals that you could take at a computer.

1) **Have any of you had any experience of these, maybe as classroom tests from your teacher, or on other courses you have taken? *E.g. driving theory test***
    a. Could you describe your experiences of this?

2) **How would you feel if your final A-level or GCSE exams used a similar on-screen format?**
    a. Do you think sitting A-level or GCSE exams using an onscreen format would be a positive or negative thing?
    b. Why do you think that?
    c. What do you think would have to change for on-screen exams to become a reality?'
        i. Security (reduced risks)
        ii. Digital skills of the students (validity)
        iii. Access to technology at school/college

3) **Are there any subjects that you think would lend themselves to using on-screen or on-line assessments?**

4) **Have you completed any coursework using an online or onscreen platform?**
    a. Could you describe this?

5) **A question about fairness now. How would you feel if one exam board offered a qualification using an online/onscreen assessment, for example for GCSE Maths, and another board offered GCSE Maths in a paper-based traditional format?**
    a. Do you think that would be fair? Why?

25 minutes

Okay, so changing focus a little now to think about this summer. Although this research was planned before the disruptions this year, I think it is important we talk about it specifically. **<If the students have already discussed this, you might phrase this differently>**

6) **So, during the school and college closures this year due to Coronavirus, have any of you had any lessons online?**
    a. Which subjects?
    b. How did you find these?

7) **Have you sat any assessments for your teachers online?**
    a. What were these like?
    b. How did you find them?
    c. What was the feedback like?
    d. Did you feel any differently compared to sitting them in class? How?

8) **To what extent has your experience this year changed your view on onscreen/online assessments?**

35 minutes

Okay, so the final thing for us to think about today is the marking of assessments.

9) **We're going to be talking about Artificial Intelligence or AI a bit here. Could anyone tell me what they understand about AI?**

    <If no one knows, give a brief definition> e.g .It is sometimes known as machine intelligence, when a machine can perceive its environment and try to maximise success or detect errors.

10) **Currently, any extended answer or essay questions (in subjects like History or English) are marked by people; physical examiners. How would you feel if an AI system or algorithm was applied as an additional check on the marking of your essay?**

11) **In questions or subjects where spelling and grammar form part of the marks you are awarded, how would you feel if AI were used to assess this part of the question?**

12) **What potential problems could you see with using AI in marking in these ways?**

13) **Could you see any potential benefits for using AI?**

14) **How fair do you feel AI marking would be for checking extended answer or essay questions?**

50 minutes

So we are coming to the end of the focus group now.

15) **Are there any topics or questions that you expected to be covered today but weren't?**
    a. Is there anything you want to say about these topics?

16) **OK, so overall, how do you see technology changing the way we assess GCSE, A levels and other qualifications in the future? Say in the next 5-10 years?**

17) **Is there anything else anyone would like to add before we finish?**

OK, so that's it from me. Thank you so much for taking part in the focus group today, your views are all really interesting and we appreciate your time.

If you have any questions about the session today and what will happen to the audio recordings etc. you can get in touch with Katy Finch (her email is on the information sheet sent out last week)