Policy Landscape, GenAl in Scottish schools
Report
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Background

Objective: ‘Reviewing the Landscape'

The objective of this study was to interview a range of experts in order to map the landscape for current and near-future use of AI (particularly GenAI) in teaching, learning and assessment within school education in Scotland. The study examined the existence of policies pertaining to this use, at various levels within Scotland, along with the nature of connectivity across the landscape. Attitudes toward use of GenAI in education were explored and issues captured. Findings from this study are complemented by desk-based research into packages used in Scottish schools. The study will feed into the development of an accessible infographic and summary to be used in other components of the overall project.

Approach

A set of remote interviews (30-45 minutes long) were conducted based on a semi-structured Interview Template, which drew from an agreed Framework of Core Questions. Basically, in the time available, interviewees were asked about: 1) their own views of the likely impact of AI (particularly GenAI) on schools education in Scotland over the next five years; 2) any policies or relevant activities (such as preparation of reports) their organisation had developed or was in the process of developing; 3) their views as to the connectedness or interactivity of Scottish organisations interested in this issue and how they would draw a map or landscape of policies relevant to GenAI in Scottish schools; and, finally, 4) key issues or considerations that should be kept in mind. By distilling and clustering views from diverse stakeholders, this report hopes to provide a rich snapshot in time that will prove useful in future dialogues and explorations.

Informants

Online interviews about 45 minutes long were conducted with 24 individuals (in 21 interviews) having a range of perspectives. Their backgrounds included: Scottish Government, Education Scotland, Scottish Qualifications Authority, Skills Development Scotland, Local Authorities/regional collaboratives, educational technology companies/consultancies; relevant alliances and groups; and key academics. The range of perspectives was what had been hoped; triangulation across multiple views has grounded this report. It is worth noting that so many individuals were willing to contribute to this study. While some wanted to be sure their comments would not be attributed to them and/or cited as an official statement from their organisation, interviewees engaged thoughtfully and candidly with the questions posed. The interview itself seemed to be a welcome ‘step back’, as many replied to their post-interview thank-you notes by saying they had enjoyed the opportunity to reflect on the questions.

Questions

A semi-structured interview template was distilled into 4 central questions for each interview:

- What is your (personal) view about the likely impact of AI (particularly GenAI) on education in the next 5 years? (e.g., on your organisation, student use, knowledge and literacy, teacher preparation)

- Does your organisation have – either established or under development - a policy – or related activities - about the use of AI tools in education, for example in assessment or support for teaching? Or a policy which includes/has been modified to speak to AI?

- Are you aware of – or do you discuss policies/issues with – other organisations in Scotland developing policies for GenAI in teaching, learning and assessment within schools education in Scotland? How joined up is work in Scotland? What would a landscape map look like?
• Have you/your organisation discussed any issues or challenges, or ethical concerns, relating to AI in Education? (On a map what would be the ‘Here Be Dragons area’?)

Responses to these questions form the basis for the principal four sections of this report.

Analysis

Interview inputs were transcribed, coded, and clustered for qualitative analysis. Key themes and messages were captured. Non-attributed quotations (anonymised as necessary) have been used to illustrate and bring to life a range of insights shared. Triangulated across perspectives of twenty-four experts, this report offers a picture of the current policy landscape relating to AI/GenAI in Scottish schools.

Appreciation

This report would not have been possible without the willingness of twenty-four people to give their time and reflect deeply on the questions posed. Their insights are very much appreciated. Furthermore, these individuals (and others) represent an important resource for Scotland.
I. The next 5 years

Introduction

Interviewees were asked for their views of the likely impact of AI (particularly GenAI) on education in the next five years. The open nature of this question allowed interviewees to take whatever tack they chose, in replying. Interviewees did not speak ‘for’ their organisations; rather, their thoughtful comments stemmed from their own individual perspective, experience and concerns. Key clusters of points are highlighted here.

Mixed Views on likely impacts

Views on likely impacts of AI (particularly GenAI) on Scottish education were very mixed. On a spectrum of panic to caution to evangelism, none of the interviewees exhibited ‘panic’ but some noted that other people felt that in some way. Many were cautious and some were cynical, referring for instance to ‘digital resignationism’ in assumptions regarding inevitability of uptake. Others were either totally confident that there would be a large impact and/or very enthusiastic about the possibilities.

The sheer diversity of views is nicely illustrated by individuals who each embodied a mix.

‘I am a cynical evangelist’

‘I kind of swing like a pendulum between two extremes … on certain days when you catch me. … I think that maybe the impact could potentially be overblown … and then sometimes I think this is going to be completely profound, you know, (and) has the potential to fundamentally change education as we know it.’

‘I sort of worry about it and get excited about it in equal measure each time I try and put my thinking hat on about it all.’

Despite a common awareness of upcoming need for professional learning by teachers, to some extent interviewees varied in their views of teachers’ views. Some interviewees emphasised the positive steps being taken by ‘early adopters’, suggesting that as a hopeful note. Others emphasised more negative views among teachers, whether due to unfamiliarity with AI/GenAI/digital approaches in general, reactions to perceived negative features or awareness that it is not aligned with assessment and other current driving forces in education.

‘We know there is an appetite … but it would be an unfortunate opportunity lost if enthusiasts jump right into the very advanced things AI can do, whereas many teachers don’t even know how to ask or even how to do the basics, and are not taking the first steps to become less fearful.’

There is a restlessness among teachers, as with any new change, a degree of anxiousness and restlessness.

Distinctiveness of GenAI

There was noticeable variation in the degree to which interviewees saw AI/GenAI as distinctive, if not unique. Some clearly saw it as so new as to be raising fundamental questions about the future of education, while others saw it more as ‘just one more’ example of the way that evolving technology can fall under traditional rubrics.

‘AI is different; AI changes pedagogy in a way these other tools do not, so there needs to be some national guidance.’
'We really need to clarify and contextualise what we are dealing with and get away from the idea that it is unique and separate from past use of technology … digital policy should be within Learning and Teaching policy.'

GenAI, to some, appears to be so novel as to be distinctive; to others, it can be seen as nested within AI. Indeed, for some, all of AI could be seen as nested within ‘digital’ approaches to education. A broader framing was suggested by at least one interviewee – to nest GenAI (and AI) within ‘emerging technologies’. This last framing was meant to be strategic, in a sense future-proofing, as education will doubtless continue to be confronted by changes in technology. Other broad framings within which GenAI or AI could be ‘nested’ were suggested as, generally, ‘learning policy’, or indeed ‘rights of the child’. Clearly, the way in which GenAI/Al is framed has implications for the way in which policy is developed.

**Pace(s) of change**

Pace of change was a common theme when interviewees reflected on likely impacts of GenAI/AI on Scottish schools over the next five years.

> I think that's the thing that phases me most is actually the pace of change. We will really struggle to keep apace with the changes as they are happening.

> The pace means we have to get on with it ourselves.

From across the set of interviews, a picture emerged of several different change processes, each occurring at a different pace:

Technology is changing fast – although some question the likelihood that the pace of technology development will continue to accelerate, suggesting it may plateau. Related to the technical change process, perhaps somewhat slower, is the uptake of new GenAI/AI developments, by society and by young people in particular.

Policymaking for GenAI/AI, interviewees have suggested, has been slow to develop. Even were national policies for Scotland to be announced, for example, some have suggested such policy would need to remain at a high level so as not to be rapidly overtaken by technological changes, as overly specific policy could necessitate continuous repairs as it became out-dated.

Education itself – if viewed as a system of mechanisms, assessments, structures, priorities and teacher capacities – was often described as conservative, likely to change at a very slow pace.

> (Given) the speed at which things change in education, five years is quite short term; it takes a long time.

A readily acknowledged challenge was the evident mis-match across the pace(s) of these changes – and, notwithstanding that, the practical need to somehow mesh those change processes toward implementation in Scottish education.

> ‘The reality is in the near future every job will be affected by this. … The difference for AI is that the speed is very, very fast and not just impacting technology but potentially every curriculum. … Skills, teachers and curricula out there will have to take account of AI; people are thinking but we will need to implement quite quickly!’

> ‘I have a sneaky feeling, given how slowly official advice tends to be compiled and published out into the system, the technology will move forward very quickly; learners will learn in some good and not so good ways, experimenting. Teachers will hold off by and large until there is firm guidance, whether Government, Local Authority or schools – that will slow up use of AI in education at the chalkface.’

**Likely impacts on students**

Interviewees cited a number of potential impacts of GenAI/AI on students and indeed this is central to the views of many interviewees.
The most prominent point in my mind is how this changes the way that students learn. How they develop their kind of learning cycle and process and, fundamentally, how these tools impact their, you know, university, college and employment - and how schools then have to use them and engage with them to get them ready for that New World.

There is an opportunity to look at how to integrate AI into teaching and learning on a day-to-day basis, to be sure it is enriched as much as possible for learners. There is also an opportunity to personalise teaching and learning, and to overcome barriers for people with particular needs.

As many possible impacts have been described elsewhere, this will not be an exhaustive list but will focus instead on two categories of observations: tools and skills.

A useful distinction was made for thinking about the evolution of tools that students are using/could use. GenAI is becoming more ubiquitous as it is being built into existing tools. In other cases, new GenAI/AI tools (e.g., for personalised learning) are being developed specifically for education. Along with time frames (some are here now, others are coming down the road), there may well be differences in implications for how teachers or schools adopt such tools.

You used to need to have the financial backing of a parent with income to have access to a tutor, whereas now with ChatGPT you have a bit of a tutor in your pocket…. Now if a young person wants to do additional learning there is a live bespoke way to do it.

(The objective is) empowering children to make better use of technology as assistive to their learning. … Those are the skills.

Many interviewees emphasised what they saw as the inevitability of GenAI/AI being an integral part of young people’s lives after they finish school - whether in further/higher/vocational education or work. This raised the question of relevant skills development, during school. For example, one interviewee underscored the need for skills beyond technical:

(There will be an) intersection between data and AI skills, and softer skills to make good quality data-driven decisions. So softer skills will need to amplify with AI.

It doesn't necessarily follow that you have to go into a technical professional role in digital tech. You could be working in a number of other sectors but using AI within those sectors.

**Likely impacts on teachers**

Interviewees spoke of possible advantages for teachers and noted that, in ‘tactical’ terms, reducing workload for teachers might speed their adoption of some GenAI/AI tools. Examples were given of tools that could reduce administrative burdens, such as timetabling.

Other tools could potentially be deployed for learning and teaching. Examples given were for use in assessments or in differentiation of materials (for different levels, different familiarity with English, different support needs, etc.). This sort of tool use could potentially free up time for teachers to engage in more ‘pastoral’ work.

Whether in discussing likely impacts on individual teachers, or speaking more broadly about the educational system, interviewees over and over again stressed the crucial need for building capacity in teachers.

One of the big changes – this is no longer just for the techies. We will have to bring many people along with us to upskill young people.

Some approaches might be more fruitful than others in bringing teachers on board. For instance, one interviewee mused:
If you're looking to refresh the curriculum, what is the core? Things that people need to know that wherever they go in their career, whatever that next step is, that they've got the basics there. So I think that's part of it. And I think part of that is the, yes, the use of ChatGPT and ... everything else, but (also) how it can be used in different sectors of the economy in different areas. And I think the other big challenge is teacher upskilling. … And perhaps the conversation needs to change to say 'actually this is something that is mainstreaming the curriculum and all teachers have a responsibility for covering this to some extent'. It is a massive (challenge). But I think it's the way it's presented, is this something that will a) help you with your job and b) will actually better prepare young people for the world of work or for the next step into college or university. So, I think sometimes people don't embrace change because they don't understand what the benefit of that change is. And I think if that can be communicated and understood, it's a bit of a hearts and mind issue with it. Then it goes some of the way to addressing the challenges. But if it's perceived to be another thing that teachers are asked to do over and above all the other things that they are asked to do, then that could be more problematic.

**Likely impact on fundamental questions of knowledge, literacy, ‘truth’**

Some interviewees stepped back to take a big picture view of likely impacts of GenAI/AI. Beyond questions of, say, how to mark individual assignments influenced by GenAI, lies exploration of what is meant by ‘knowledge’, what are regarded as reliable sources of knowledge and what expectations underlie education if young people are to be ‘literate’ in the changing context. Related to these questions, inevitably, are concerns about how education (whether using GenAI/AI tools or not) will help young people cope in what is often referred to as a ‘post-truth’ world that will be increasingly influenced by GenAI/AI and its potential for mis-information. The touchstone for many looking to the future is putting fundamental learning and teaching goals (rather than tools) at the core.

> Any discussion about AI tools and services should begin with the teaching and learning and what you want to achieve, and following on from that, what tools or services you need. Start with the pedagogy and aims of what you want to achieve. Then assess tools to see if you can use the tools to support that.

**II. Current or in-development policies for (Gen)AI in teaching, learning and assessment within schools education in Scotland**

**Introduction**

One objective of this study was to try to capture the current ‘policy landscape’ for GenAI/AI in teaching, learning and assessment within schools education in Scotland. No neat listing of existing policies emerged. Instead, some steps were described, whether to a policy under development (usually not to be cited in any detail) or to guidance/support activities. More generally, an intangible yet strong impression of the current environment was conveyed.

**Many individuals of good will**

Without doubt, there are many thoughtful, informed individuals of good will who are committed to trying to find a positive path through the uncertainties of GenAI/AI utilisation in Scottish education. Although for the most part not yet manifested in formal policies, their reflections are building a base for future policies and implementation.

**Sense of waiting for policy lead to be taken**

There is a strong sense that people are waiting for a lead to be taken in policy. Primarily, this took the form of waiting for a central, national policy from Scottish Government. Just one example of many comments is:
My sense is that (most of) Scottish schools are waiting… for kind of leadership and direction and also some indication of how embracing AI will be supported.

**Current policy context**

Note: Much of this sub-section stems from a summary by Professor Judy Robertson.

Scottish Government: “currently advocates the use of UK Government guidance on the use of generative AI”. However, Scotland specific policy is not yet developed.

The UK Department for Education says: The education sector should:

- "make the most of the opportunities that technology provides"
- “use technology safely and effectively to deliver excellent education that prepares pupils to contribute to society and the future workplace”
- “prepare students for changing workplaces”
- “teach students how to use emerging technologies, such as generative AI, safely and appropriately”.

The Independent Review of Qualifications and Assessment in Parliament mentions AI in its recommendations. Before Scottish Government formally responds, it will wait for debate. The Scottish AI Alliance is conducting an independent review of the AI landscape, across sectors, without mentioning education in detail. Scottish Government is expected to respond in the near future. The revised Scottish Government digital strategy will include AI; that is expected to be published later this year. The current position of SQA is that learners cannot submit AI outputs as their own work and AI cannot be referenced as a source (although a working group, surveys, a series of consultations and engagement events may lead to a modified approach). At a different level, Glasgow City Council has a draft policy guidance for schools.

**Support/guidance steps being taken**

Some interviewees provided examples of support that is already being provided, for example in the form of guidance, even in the absence of/before the emergence of official policies. It is worth noting that – in some cases - forward motion can be achieved in the short-term, at a faster pace than policy formalisation.

*Teachers will have to show learners how to use it safely and ethically and productively. They can't do that if the teachers don't know. .... (that means) seeking to take some very easy steps to let beginner teachers see how they can do things safely and productively while waiting for a position to emerge from government.*

Education Scotland: does not take a firm policy decision on the use of AI in schools, as that is seen as the role of Scottish Government. However, Education Scotland will offer professional learning for teachers, with guidance including positive uses of the technology as well as possible areas of concern for teachers and young people.

*Policy decisions from big organisations do take time. But I do find that some of the support now that Education Scotland has given us is actually becoming quite helpful.*

Even before a national policy, a number of interviewees spoke about conducting research, amassing literature reviews and/or investigating what other countries are doing. Many interviewees have held or participated in discussions, workshops, surveys or consultations.

**Speculation as to evolution**

Discussing the context of policy led some interviewees to reflect upon the overall system, with speculation as to how it might evolve. Interviewees are aware that individual teachers and schools are experimenting with GenAI/Al, but, equally, that there is no established
mechanism for sharing lessons learned or adopting successful approaches more widely. Scalability from pilots will be an interesting challenge.

Now, with AI coming, it is pushing the education system to shift more rapidly to 21st century problem-based and creativity learning. But many teachers don’t want this; they are really pushing back and are very sceptical about AI. So we need to show it is possible to use AI in progressive educational ways so students are learning more instead of less with AI. … It is just a question of how it will happen and how do we involve the professionals in the process. … For change, it is important to have a national steer with local schools able to (pilot AI approaches) and involve them in a way that you have the possibility to showcase how this can be done and then talk to other schools.

The only way we can work with this is through interdisciplinary understanding and collaboration and communication across a range (of perspectives and experiences).

The real trick will be pulling people in in a coherent way - to coalesce everyone’s ideas into a single overarching vision for the landscape of education.

How do we culturally bring individuals with us and change practice - hard to do and in the timescale. And budget, some of this will need money; a big challenge is how will we fund it. …

There is a real consensus that AI is important; getting around a table is not an issue, but implementation is a challenge because money is tight.

III A. Connectivity across organisations in Scotland

Introduction

To gain a sense of connectedness (or otherwise), interviewees were asked about the extent to which they (or others) discussed policies or issues with other organisations in Scotland, regarding GenAI/Al in teaching, learning and assessment within schools education. The following emerged as overarching impressions of the nature of joined-upness in existence.

Informal conversations

Clearly, informal conversations are taking place across organisations through particularly engaged individuals.

Alliances, groups, regional collaboratives, ADES

Some groups or alliances in Scotland touch upon - or could touch upon - GenAI/Al issues. Examples at different levels include: alliances including the cross-sector Scottish AI Alliance; regional collaboratives, the Association of Directors of Education in Scotland; teacher professional organisations, as well as relatively informal discussion groups.

Individuality of organisations’ efforts

Despite strands of connectivity, for the most part different organisations seem to be finding their own paths to dealing with the challenges of GenAI/Al.

Context of education in Scotland – multi-player governance; multiple policies

Interviewees, often wryly, provided tutorials in the complexity of the context for education in Scotland. The multi-player and multi-layer nature of governance of education featured strongly, particularly as this comes with multiple policies. This fragmentation and complexity have implications for capacity to adapt to GenAI/Al.

‘The main challenge is that education in this country is so fragmented it is a real challenge to effect change.’
Willingness to come together, but lack of obvious leadership role

From across interviews, it does seem that there is an appetite for being convened to work together.

There are a lot of very intelligent and very good and willing enabled people. What there isn't is the directive to go and do and there isn't the clarity of vision at a leadership level of what that looks like. … We don’t even have a kind of parity and clarity on the existing digital infrastructure, the landscape, the provision of services. There’s a lot of people doing good, lots of good things, but it’s disjointed. … there just isn't that collective coordinated digital picture.

I think there's huge potential and and I've seen it. I mean that's not to say there’s nothing happening in Scotland around AI, but it's not been driven by any kind of leadership at the centre.

There are opportunities to share rather than all organisations doing their own thing.

One of the biggest problems, though, has actually been (being) able to allocate that time to the talking … This is why the sort of stuff like what you guys are doing - is really, really going to be useful because we've got to keep business as usual going at the same time. … (that) sometimes overtakes that sort of time (for) actually sitting down and having a good old think and a good old blether about it and actually trying to come up with bubbles of thoughts and try to join it all up. It isn't really happening as quickly as it should be.

There seems to be a desire for a leadership role to be taken, but no organisation seems to be ready or able to take the initiative to do so, as yet.

From my angle I don’t know (why) everyone is kind of waiting for someone to take the lead. My pay grade is one that doesn’t understand why someone hasn’t done that already.

Everyone is waiting to hear what someone else is doing. No one wants to jump first.

(There have been) some very interesting discussions with different parts of the education system, but it has been a struggle to get momentum and know who will take leadership on this, because the landscape is so fragmented.

‘The landscape) would probably consist of a series of unconnected dots or squiggles at the moment. … No one is quite having the confidence to take ownership of the issue and take the lead on the issue; no one is quite sure whose remit it is under’.

III.B. Mapping the Landscape

Introduction

Interviewees were encouraged to describe their view of a ‘map’ of the Scottish ‘landscape’ of policy and activity related to GenAI/AI. This question provoked thoughtful reflections, even stimulating metaphors and possible visualisations.

Key features of the landscape

Fragmentation occurred repeatedly as a feature of the landscape.

In terms of the map, I think you draw a lot of maybe about a dozen circles, some of which overlap with each other. And that reflects the fragmented nature of (the landscape). … It would be an incoherent map. …It wouldn't make sense because it's not being driven in a direction that is understandable and in any way consistent. … I
tend to see it as a jigsaw more than a map. And there are there are one or two bits that fit together, but there's an awful lot of bits that are missing.

One interviewee described a number of 'strands', concluding by observing how difficult it is for teachers to see that landscape.

There are some key strands here to be covered in a map. A) The role of AI in qualifications and assessment, probably the most pressing right now, with fears about coursework and assessment driven by ChatGPT or whatever. B) There is another whole piece about teachers' time and administration … there must be massive opportunities to help with digital technology. … C) People talk more about what we are teaching kids about AI and how to use it in the classroom. What are we teaching kids about AI – there is more than one strand: ethics, emotional well-being , and the computer science at the other end of the scale, how are we building algorithms, how can we use AI or GenAI in everyday life to support study or whatever, so a strand for learners. D) The other piece is teachers' digital skills. … the level of digital skills among teachers is massively variable… There is a whole piece on readying the profession. E) The longer term – this stuff will evolve and people will need to adapt. How do we ready the workforce to do that. … There are so many eggs in the one basket of teachers to prepare students for rapidly changing technologies. There is lots of stuff going on but a lack of coherence; how could teachers see through that?

A not un-related feature was the existence of multiple players. In addition to individual teachers and schools, these included (but are doubtless not limited to): public sector; public agencies; parents; young people; employers; articulating colleges and universities; non-tech people such as community groups or third sector that tend to be outside of tech ecosystems; professional organisations such as subject specialist teacher organisations; small and private sector. (When the private sector is in the form of large companies based abroad, concerns were expressed that they would not listen to real needs. One suggested that the last 'could be envisioned graphically as a distant ominous Gotham City type of area’ on the map’.) Listening to/inclusion of different voices was urged.

Another view of heterogeneity in the landscape was to emphasise the existence of multiple components in the landscape. This could include, for example, not ‘simply’ a range of policies but also a range of types of support, e.g. ‘a map of policies and support, interwoven’.

Overall, envisioning the landscape highlighted complexity. For some, this meant describing the landscape as consisting of multiple levels (e.g. national, regional collaborative, Local Authority, school). The landscape was also seen as existing in layers – for instance, one suggested drawing the GenAI/Al policy map on top of a 'layer' that is existing teaching and learning policy. Another wondered about organising the picture of the landscape according to priority themes of Scottish Government.

One interviewee, in speaking of a need for Scotland-wide coherence, ended up with a phrase that doubtless all interviewees would find accurate.

There needs to be a Scotland- wide framework policy or guidance. But everyone is under pressure and because AI is moving so fast, the pressure is very intense for a lot of educators. … A perfect phrase for GenAI or Al in education in Scotland is ‘It’s complicated’!

Another suggestion for drawing a map was to consider doing so by using particular lenses, for example drawing the policy landscape from the point of view of the teacher or putting the learner/young people at the centre of the map.

The easiest part of the visual is just having the learner in the middle.

Keenly aware of the challenge of addressing changes, interviewees often invoked the need for evolution, effectively adding the fourth dimension of _____ to the landscape.
‘Now, the map would be ripped in lots of little pieces that don’t quite join, but it should look like more of a journey. … the landscape of technology will change over time. … a dimension of time is needed in this map’.

In line with this perceived need for evolution, many of the interviewees could not help but view the landscape as calling out for actions, including verbs such as ‘burrowing’, ‘hacking through’, ‘solving’ or ‘placing guardrails’ in their often metaphorical comments. These are captured in the next section.

**Visualisations**

**A maze**

‘Currently the map should look like an unsolvable maze but the solution should be that everyone is working together to find their way through the maze. The problem is that there isn’t a map. … When thinking about a national policy, there are also all these local experiences and policies that would have to be taken into consideration.’

**A jungle**

‘The landscape I would say is like chopping down trees in a jungle. At the moment, I think it’s just all over the place. … There’s no clear plans come our way. … We’re waiting really to see what the national advice is going to be, because otherwise what we’ll do is we’ll create 32 different versions for each of our local authorities, and then that might get further synthesised into six different versions for each of the regional collaboratives. … So I think that’s a little bit messy.’

In addition to not being able to see clearly through the jungle, this interviewee noted that, sadly, within this jungle there could well be ‘dinosaurs’ unwilling to adapt.

**A path**

‘I immediately think of a very winding path. We are all on a journey; some people will run; some will walk slowly and need lots of support. Sometimes the road is not even carved out before we get to when it is an inherent part of our world. It will need a lot of different activities happening to get us all on our journey. … It is a big journey, we will all be on in different positions, with guardrails and what we need to put in place to help people on the journey. … So a teacher is setting off on a path, with all those actors, national, Local Authorities, professional organisations, parents shouting from the sidelines and parliamentary debates. Teachers may ask ‘where is the map’ (but) we say ‘sorry, our cartographers are busy working out the map through the swamp of AI’.

This interviewee brought together themes of individual efforts and heterogeneity with a need for working together to travel the journey toward safe and effective use of GenAI/AI.

**Industrious moles**

Musing on the opacity of the current landscape, within which many individuals were working hard to make sense of the new dimensions of GenAI/AI, one interviewee came up with an unexpected – but strangely compelling – image.

*I think there are some people who are engaging earnestly with the question and not being swept along by the hype, but trying to cut through that and deal constructively with a very difficult topic. Moles industriously burrowing through the blackness of soil – but that would probably not be a well-received characterisation! But more the opacity of the topic and the difficulty of seeing that far ahead. Steady careful progress (is what) I think policymakers are trying for.*

**Hope for connectivity**

Despite concerns, and despite a sense of waiting for national policy, some expressed hopes for connectivity when considering a picture of the landscape. The need for conversations
across networks was emphasised. The idea of connections arose, sometimes. One interviewee, for instance, spoke of connecting nodes, as in a human brain.

‘A map would have to represent the different locus of control or influence that different organisations have because they have their own remits, with inter-relating arrows between all the organisations and how they work together’.

Occasionally, a note of hope was sounded, in recognition of current efforts. One interviewee, for example, spoke of the need to foster positive change, in the form of ‘promising green shoots’.

‘There is more good will and expertise and realism than people usually give credit for in those organisations, so we have a lot of promising green young shoots but the problem is they are often in environments that are not nourishing to innovation. It is about nurturing them and getting them to work together and reach a critical mass so individual efforts don’t get overwhelmed by the hype.’

‘There are a lot of well-meaning organisations trying to make the best out of something that is really fast-moving.’

IV. Issues, questions to be addressed

Introduction

Interviewees were asked to identify issues that should be considered or questions that need to be addressed. This could be the area of a map that is emblazoned with the warning ‘here be dragons’. The brief, non-exhaustive list that follows is grouped into clusters of: concerns about managing GenAI/AI; questions of change; and system issues. As with any clustering, judgements might differ – and some issues could fall under more than one cluster (e.g., inequal access could fall under management and/or system issues). To appreciate the proportionality of attitudes, it should be noted that interviewees were complying with a request by providing these issues; their commentaries were not ruled by negatives. For most if not all interviewees, there was a sense that, of course, issues exist but, of course, they need to be addressed as we move forward.

Concerns about managing GenAI

Plagiarism/cheating/sourcing issues

Interviewees observed that for teachers, the principal operational concern driving negative attitudes has to do with students using GenAI to do their work for them. This can be seen as rarefied plagiarism, inability to cite sources or, ‘simply’, avoidance of independent effort and opportunities missed for actual learning. It was noted that higher and further education institutions, which many young people will be attending after school, have been wrestling with development of their own policies in this arena. (An example given was Glasgow University’s return to exams taking place in an exam hall, to avoid mis-use of sources such as GenAI/AI.)

Bias, not taking account of diversity, transparency, reliability

Many interviewees cited concern over bias in what young people will encounter, due to the way in which GenAI generates information by building on what appears frequently. Compounding (mis)information in this way can allow biases to appear as reliable, authoritative fact, particularly to young people if they are not taught about exerting critical judgment. Concerns were also expressed over the way in which diversity may be left out of the equation, potentially disaffecting young people of minority or immigrant backgrounds, for example. Transparency was also raised as a potential issue that students and teachers need to be aware of when using GenAI/AI.
Security and privacy (especially for young people)

Many interviewees noted privacy and security as issues of concern, whether personal data about young people is shared with ill-intentioned individuals or 'simply' fed into the algorithmic maw of large companies. Responsibilities for protecting young people's security and privacy will inevitably fall to teachers and schools, if GenAI and AI are utilised in the classroom.

Ethics

Many of the issues could in some sense be viewed as having an ethical dimension. One interviewee provided a useful summary of ways to think about AI and ethics.

Ethics is really thinking about the reasons. … think about the ways in which the new technology or whatever could undermine people’s dignity as persons or cause them direct harm or somehow undermine our lives being better overall….. If you think about use of AI in those three ways, that is a way into it. Then think what is AI, what does it do, what does it require and what are the consequences; then you can define issues that relate to those three things.

Change

Role of teachers

Interviewees cited the possibility or indeed likelihood of change in teachers’ roles with an increased use of GenAI/AI. In some ways, this change could be simply welcome assistance with administrative or assessment burdens. In other ways, however, teachers might feel undercut in their role as the principal, most reliable source of information in the classroom.

Social dimension of education

The point was raised that teaching and learning have traditionally been activities involving human interaction, with the classroom providing a social dimension to education. A possible issue could be that the social dimension – or, indeed, the quality of the relationship between teacher and student - might be altered or de-emphasised with use of GenAI/AI tools.

Nature of ‘knowledge’, potential spread of mis-information

Not surprisingly, interviewees raised as an issue the potential for use of GenAI/AI tools to change views of knowledge, whether fundamentally in students’ sense of the nature of knowledge or practically in terms of what they view as adequate. The worry was expressed that students might fall prey to the apparently accelerating spread of mis-information.

Learning/skills needed by young people, post-school

Alongside concerns over issues such as bias, lack of transparency, or spread of mis-information, interviewees observed that skills young people need today and in the future will need to evolve. Chief among these is the need to more explicitly include critical thinking so that they can exercise independent judgement over what is provided to them by GenAI/AI (or other sources). In the face of the functions that GenAI/AI can take over, interviewees observed that a crucial capacity to be fostered in young people is that of creativity.

System issues: Implications for the system/readiness

Inequality (of access, technology & schools)

An issue raised frequently was that of inequality of access to GenAI/AI. Access to technology, internet and informed teachers/supportive schools is in some sense an operational issue in the management of GenAI/AI tools in learning. However, lack of parity across schools is a system issue and one about which many informants were greatly concerned when thinking about the future of Scottish education.

The benefits that accrue to young people across Scotland is going to be partly impacted by that inequity in technological infrastructure.
'A lot of teachers are dealing with whether or not children have had breakfast, not the ethical implications of MidJourney. … (GenAI) might be a great leveller but there is the chance it will further entrench these inequalities.'

Maybe you've got an engaged school, maybe you've got an engaged practitioner and they see the value and they lead, but there's no centralised coordination. There's no provision, you know, no centralised provision. There's no base level kind of standards or resources for practitioners and then what you end up with is a really disjointed landscape and fundamentally a lack of parity for learners across the education landscape, I think that we should learn the lessons of what happened over the last 30 years with the rise in digital and computing … and move forwards appropriately.

Assessment (SQA, Inspectorate)

Interviewees raised assessment as a critical factor in any system-wide change in education. The degree to which (if at all) SQA and the Inspectorate accommodate their approaches to the advent of GenAI/Al will inevitably shape policies and practices at a variety of levels.

Even in the last year or so things have moved so quickly; there is already an impact; it will not go away … students and experiments with GenAI will probably overtake policies. There will be a massive impact, how do we want to view it – something to fear or embrace more positively. … We need to see how AI is used in schools for learners and teachers, and assessment should follow from that. … … Assessment needs to measure what it needs to but it also needs to reflect the real world.

Teacher preparation, Professional Learning

Interviewees were keenly aware that the majority of teachers are not ready to use GenAI/Al and/or to guide their students in its use. Because these tools will not be segregated to just ‘tech’ courses, the need to address capacity is widespread. Capacity-building in terms of targeted, accessible professional learning was cited as a critical need for the education system of Scotland.

There's a long way to go in the teacher training and that's my worrying part - that we need to get that CPD or professional learning into teachers.

Incorporating multiple voices: young people, parents, teachers, others

Whether changes are made at a local level, or, particularly, at a system level, interviewees stressed the need for incorporation of multiple voices (e.g. young people, parents, teachers and others) in developing changes, with a particular emphasis on students.

I think there is a need for actual education policy around use of GenAI but I think it should be based around the rights of the child… I think a rights-based people-centred approach is key.

Readiness of the system

Some interviewees reflected quite deeply about the capacity of the educational system to change. Some talked about short and long-term horizons, and/or related tactics to increase the system's readiness.

The key thing for me is there are two horizons; long-term embedding of GenAI and understanding the role we might play in preparing the system for that. … How can we lay a solid foundation for the future. But there is (also) immediate stuff we need to do now to safeguard the system, whether in qualification or misuse of data, but the immediate stuff is not to roll out tech solutions for all problems in education, because the system is not ready for that.

There is progress in this area, but I think there's a big job to kind of join up all the policy thinking around it. … I think the important thing is to kind of build a workable model which is scalable in other areas and then it moves at relative pace.
Some would underscore the necessity of viewing the challenge as one of changing a system, while expressing serious reservations about the readiness of Scotland’s educational system to adapt to AI/GenAI.

Five years is a short time for policy development but a huge time at the pace the technology is developing. … I have major concerns about the readiness of the system to embrace GenAI right across the piece. … We have not really embedded traditional digital use – that is patchy and inconsistent. So that impacts on the system’s ability to embrace GenAI.

I think education has almost been put in the too-hard-to-do box because Scottish education is hugely complex. … the way forward, … it’s probably local networking and local connections … (and) very small-scale projects because I think that is the way forward. … But even they are hitting the buffers at times because it does need a degree of investment to allow to allow those small-scale exercises to span more widely across. …There is a statement in the AI strategy, I seem to remember it saying that AI development will require sustained investment. Well, it’s not happening in education. … (young people) are significantly more skilled than 90% of the teachers in Scotland around the use of technology and … AI is there already and it’s only going to play a more prominent role. And yet we seem to be getting further and further behind the curve. … There are a lot of well-meaning folk out there, and don’t get me wrong here, there’s a lot of really good stuff happening in Scottish schools. But what we’re not good at … is thinking ahead and looking at what changes are required to the system.

I think that at times we lose sight of what we’re all trying to do, not individually, but collectively, … The individuals are usually working well and working hard. If we’re to look at this, we need to build a system that thinks about the impact of generative AI on our learners. Pandora’s box is open.

Need for political will … and investment
Interviewees were far from naïve about the challenges of adapting Scottish education as a national system. To achieve this, political will – and investment – were underscored.

Everyone’s trying to fit this stuff into the system that exists …. (but we should be) trying to think about it from the ground up, basically. What, how it’s going to impact, how is this going to change? And you know the problem is that to do that you’ve got to spend a lot of money and you also, from a policy perspective as a politician, you really have to go out on a limb…. (and) nail your colours to the mast and look to do things differently.

V. Concluding Comments
Conducting this study leaves the author of this report with the following key conclusions.

1) Scotland has a rich resource in terms of informed, thoughtful people who are aware of both opportunities and issues posed by GenAI/Al for Scottish education.

2) Although the current landscape is fragmented, there is a clear desire for greater connectivity and a willingness among many to be convened in order to talk, share insights and even work together across organisations.

3) Given the difference in pace of change between technology development/uptake, education, and policymaking, convening people now would help to identify practical steps that can be taken even before the emergence of a central policy.