SQA Assessment Arrangements and Assistive Technology following Covid-19

Paper submitted to

Mhairi Shillinglaw, Research and Policy Manager Equalities

Alastair Black, Co-ordinator – NQ Assessment

Scottish Qualifications Authority

6th August 2021, revised 18th October 2021

Paul Nisbet
Director
CALL Scotland
Moray House School of Education and Sport
The University of Edinburgh

Contents

Summary

In December 2020 CALL Scotland was asked to undertake environmental scanning (Albright, 2004[1]) into the use of assistive and inclusive technologies by learners who require Assessment Arrangements during the 2020-21 academic session, in the context of changes to assessment of National Qualifications due to the Covid-19 pandemic and response.

A report was submitted to SQA in January 2021 and we were asked to continue research and update the paper to take account of developments throughout the remainder of the 2020-21 academic session. A report was delivered to SQA on 6th August 2021 and revised for publication for wider discussion for stakeholders in October 2021.

The issues discussed in this paper are drawn from a range of sources: desk-based research around guidance and publications from the Scottish Qualifications Authority, Scottish Government and Education Scotland; video meetings with practitioners in schools and local authorities; and research into and testing of specific technologies. These meetings involved a relatively small number of colleagues and so are indicative: more research is required to understand how the Alternative Certification Model (ACM) was implemented for learners who required technology-based Assessment Arrangements in 2020-21.

Our key findings are:

- The ACM resulted in a significant increase in the number of individual assessments conducted which increased workload and complexity for provision of Assessment Arrangements for students with disabilities or additional support needs.
- The Covid-19 pandemic and response has driven an increase in the use of digital technology for teaching, learning and assessment. Students in several local authorities have been provided with personal digital devices and Scottish Government has committed that every pupil in Scotland will receive a digital device.
- Students are using devices based on Windows and iOS and Chromebooks and guidance and policies on technology-based assessment arrangements should reflect this context.
- The research suggests that SQA Digital Question Papers in PDF (particularly question-and-answer papers) were not commonly used by candidates using iPads or Chromebooks in 2020-21 due to technical, administrative and policy-related factors. Action research with practitioners and students is required to investigate and address these issues.
- The research indicates that Digital Answer Booklets in .docx format are not accessible to students using Chromebooks or word processor tools such as Immersive Reader in Microsoft Word. DABs should be re-designed accordingly.
- The functionality, accessibility and security of Digital Question Papers and Answer Booklets varies depending on the device and software/app used by students.
- SQA policies on assessment arrangements and internet access and use of accessibility and learning tools (e.g. spellcheck) do not align with current technologies and practices in schools and should be reviewed and developed in co-operation with practitioners.
- DQPs and DABs in PDF have functional and accessibility limitations and consideration

[1] Albright, K. (2004) Environmental Scanning: Radar for Success. The Information Management Journal, May/June 2004.

should be given to creating assessments in other digital formats.

- Comprehensive research into the Assessment Arrangements that were provided for students as part of the Alternative Certification Model in 2021 would provide valuable information to inform the development of policy and guidance on assessment arrangements, the use of technology, and Digital Question Papers and Answer Booklets.

Support for practitioners

The conversations with teachers, lecturers and parents raised a number of urgent issues and questions in 2020-2021 and in response we created and published blogs on the CALL Scotland web site on many of the topics discussed in this report. These blog posts provide additional detail to the discussion in this paper.

Technology-based Assessment Arrangements for SQA 2020-21 Assessments (14 December 2020)

All National 5, Higher and Advanced Higher assessments are now going to be assessed by schools and centres internally. What does this involve for learners with disabilities or additional support needs who use technology to access learning?

Technology-based Assessment Arrangements - Internet Security (14 December 2020)

How can we manage and administer digital assessments for National 5, Higher and Advanced Higher in 2021? Can we use cloud-based tools such as OneDrive or Google Classroom?

Technology-based Assessment Arrangements - Which Digital Formats? (15 December 2020)

Which digital formats should we use for our internal National 5, Higher and Advanced higher assessments?

Technology-based Assessment Arrangements - Speech to Text Alternatives to Scribes (16 December 2020)

Modern digital devices all offer free, built-in speech-to-text or computer dictation tools. Can learners with disabilities or additional support needs use these tools for National 5, Higher and Advanced Higher assessments?

Technology-based Assessment Arrangements - during Lockdown at Home (6 January 2021)

On Monday the First Minister announced that schools would only be open for children of key workers and vulnerable children for January. In many schools, January is 'prelim month', so how can prelims or assessments be undertaken when most learners are at home?

Technology-based Assessment Arrangements - Digital Assessments Must be Accessible. (J January 2021)

Digital Assessments must be accessible to all learners including students with disabilities or additional support needs. In this blog we explore what this means and how to create accessible assessments.

Technology-based Assessment Arrangements - SQA Digital Exams on iPad. (13 January 2021)

With the latest version of ‘Books’ on the iPad you can type into answer boxes on SQA Digital Question Papers. Find out how in this blog.

How to read maths with Immersive Reader (27 January 2021)

Last Friday a teacher asked if we knew how to read mathematical expressions with Immersive Reader. Here's how it can be done.

Accessible Word Templates for 2021 National Qualifications. (11 March 2021).

2021 examinations have been cancelled and teachers and lecturers are devising their own assessments to gather evidence of attainment. We have updated pages on the Digital

Assessments web site with information and advice and some downloadable templates to help practitioners create accessible assessments.

SQA 2021 Assessments and beyond - an Insight into Using Technology (29 April 2021).

Dyslexia Scotland have published an excellent video workshop by Dawn Roberts and Innes Roberts on the use of assistive technology in assessments, and more broadly. The video is well worth a view if you are a teacher, parent or student using digital technology in assessments this term.

How to Divide and Edit SQA Question Papers. (3 May 2021).

Last week a teacher called us to ask how to split up SQA question papers because they need to separate out sections to use in classroom assessments. This blog has some hints and tips.

Impact of Covid-19 on teaching, learning and assessment

Covid-19 has had significant impact on teaching, learning and assessment in Scotland and upon assessment and award of National Qualifications: the 2020 examination diet was cancelled[2]; 2021 National 5 external examinations were called off in October[3]; and in December 2020 Scottish Government cancelled Highers and Advanced Highers examinations[4].

There is some evidence that learners with disabilities or additional support needs have experienced greater negative impact on learning than children and young people who do not have additional support needs:

"*Local authorities also highlighted challenges in ensuring appropriate provision for pupils with additional support needs and for those in the early years given the significant levels of support required to access resources and activities*."

Education Scotland (2021) National overview of practice in remote learning: local authorities, p.7[5]

"*Within some special schools there are significant challenges in supporting children and young people accessing remote learning. For most learners with severe and complex needs, they often require specialised approaches and some need specialised equipment that may not be easy to take home or use there. In order to meet the needs of their learners, many schools have adapted their curriculum to focus on the development and application of life skills, for example, digital literacy, communication and health and wellbeing. Schools recognise the need to widen their curricular offer and continue to develop approaches to supporting individuals and families*."

Education Scotland (2021) National overview of practice in remote learning: schools, p.6[6]

"*Overall, more work needs to be done to meet children's learning needs, including ensuring remote learning takes account of their child's additional support needs. A few parents of children or young people with additional support needs (ASN) speak positively of the level of contact and support their child has with their school. However, this is variable and some parents of children requiring additional support report they receive little or no support, or communication, from their child's school*.

Less than half of parents (primary school 46.3%, secondary school 38.8%) said that they strongly agree or agree that appropriate adjustments have been made to support their child's individual learning needs. Some learners with additional support needs told us that would like more support and reported that they struggled at times with the lack of structure. Access to adaptations, which are available in school, such as extra support or resources in large print, are often unavailable at home. Many parents of children who have additional support needs do not feel they have the

[2] Scottish Government (2020) Update on school closures and exams 19/3/20. Accessed 9/7/21.
[3] Scottish Government (2020) SQA Awards 2021. 7/10/20. Accessed 9/7/21.
[4] Scottish Government (2020) Coronavirus (COVID-19) - education sector: Deputy First Minister statement 8 December 2020. Accessed 9/7/21.
[5] Education Scotland (2021) National overview of practice in remote learning: local authorities.
[6] Education Scotland (2021 National overview of practice in remote learning: schools.

expertise or in some cases the time, alongside working and supporting other children, to provide the required support at home."

Education Scotland (2021) National overview of practice in remote learning: parents, carers and learners, p.17[7]

Reporting on a study of the experiences of 16 families during 2020, Coupar-Kenney and Riddell conclude that "*particularly in the early days of the lockdown, scant regard was paid to the rights of children with ASND as education and care services were suddenly withdrawn. Existing inequalities were exacerbated, such as unequal access to IT, varying levels of support and differences in family resources*."[8]

The Children and Young People's Commissioner Scotland, drawing on an independent children's rights Impact Assessment[9] on the response to Covid-19 in Scotland concludes that "*those with disabilities or additional support needs have been disproportionately impacted by the pandemic*".[10]

Alternative Certification Model

In recognition of the impact of the pandemic (e.g. school closures and learning at home; pupils missing teaching due to self-isolation; lack of physical contact for practical subjects; etc), the National Qualifications 2021 Group created an Alternative Certification Model[11] which included subject-specific guidance, assessment resources and professional learning and support resources for teachers and lecturers.

National qualification awards in 2020-21 were based on "*demonstrated learner attainment consistent with the requirements set out in the subject-specific guidance*"[12].

In October 2020, SQA noted that "*where possible, we will specify between two and four pieces of work per subject that will form the basis of arriving at a final award*"[13] and to support centres, SQA provided 2020-21 question papers and marking instructions that "*could be used in full or in part (or not at all). For example:*

- *The question papers could be split into smaller sections to allow assessments to take place over more than one classroom period (where learners complete different sections of the question papers on different days).*
- *Teachers and lecturers could extract content from the question papers to create their own bespoke assessments*."[14]

---

[7] Education Scotland (2021) National overview of practice in remote learning: parents, carers and learners.
[8] Fiona Couper-Kenney & Sheila Riddell (2021) The impact of COVID-19 on children with additional support needs and disabilities in Scotland, European Journal of Special Needs Education, 36:1, 20-34, DOI: 10.1080/08856257.2021.1872844 Accessed 13/7/21.
[9] Children and Young People's Commissioner Scotland (2020) Independent Children's Rights Impact Assessment. Accessed 13/7/21.
[10] Children and Young People's Commissioner Scotland (2020) The pandemic's impact on: Children and young people with disabilities and ASNs. Accessed 13/7/21.
[11] SQA (2020) Alternative certification model - National Qualifications 2021 Accessed 9/7/21.
[12] SQA (2021) Revised model for delivering National 5, Higher and Advanced Higher results in 2021. Accessed 18/10/21.
[13] SQA (2020) SQA statement on arrangements for the assessment of National 5, Higher and Advanced Higher courses in the 2020-21 session. 7/10/20. Accessed 9/7/21.
[14] SQA (2021) Assessment resources. Accessed 12/7/21.

Impact of Covid-19 on Digital Teaching and Learning

Research indicates that school closures and learning at home has driven increased adoption of digital learning:

"*All local authorities have taken steps to improve children's and young people's access to remote learning*."

"All local authorities provide access to platforms for online remote learning. Local authorities report that data indicates that these resources are being used by increasing numbers of class teachers to shape learning activities."

(Education Scotland (2021) National overview of practice in remote learning: local authorities, p.3[5]

All [local authorities] have utilised additional funding, from both Scottish Government and council budgets, including the Digital Inclusion Grant to purchase digital tools for learners and staff."

Education Scotland (2021) National overview of practice in remote learning: local authorities, p.4[5].

"*Almost all headteachers describe an increase in the confidence of staff when using digital platforms and delivering remote learning for learners, including those with additional support needs. Most schools provide a range of guides, tips and direct support for learners with additional support needs in using digital platforms. Schools report that teachers are making more use of assistive technology to support children and young people to access learning. They feel this is helping children and young people who require additional support engage with learning activities*."

Education Scotland (2021) National overview of practice in remote learning: a focus on meeting learning needs, including those with additional support needs, p.4[15]

[15] Education Scotland (2021) National overview of practice in remote learning: a focus on meeting learning needs, including those with additional support needs.

Increased access to digital devices

Over the past year more learners have gained access to personal digital technology for learning. Pupils in in Primary 6 and above in Glasgow[16] and Scottish Borders[17] schools are being provided with personal iPads while City of Edinburgh council announced a similar initiative in 2021[18]. The roll-out of iPads in Glasgow and Scottish Borders has been accelerated as a result of Covid-19. Learners in Aberdeen, Highland, Stirling and West Dunbartonshire are being provided with Chromebooks.

The Scottish Government Covid-19 laptop scheme provisioned 25,000 Chromebooks (although only 18 out of 32 authorities apparently accepting the devices; the other authorities used the funding offered to invest in other technologies[19]) and the government planned to distribute 50,000 devices by the end of 2020[20]; 72,288 devices were distributed as of 13 July 2021[21].

In March 2021 John Swinney said "*Just as in my day, the teacher handed out a jotter to all, so in this internet age, we will hand each child the device they need to learn and prosper*"[22]. Scottish Government has begun working with local authorities "*to provide every school pupil in Scotland with a laptop or tablet*" and is considering "*how to deliver consistent digital infrastructure across Scotland's 2,500 school buildings*"[23]. It is probable that the current models of provision in different local authorities will continue (i.e. some areas will provide Windows, others iPads, others Chromebooks, some a mixture) and that Scottish Government, through the initiative, will aim to achieve more equitable access to digital technology and learning.

In the near future every learner in Scotland in the senior phase will have a personal digital device, and this raises several questions regarding the use of technology as an assessment arrangement. For many learners with disabilities and/or additional support needs, it is likely that assistive technology will become the "*normal way of learning and producing work*"[24] and therefore it is probable that technology-based assessment arrangements will become more common.

However, the largest disruptions will occur with the 88% or so of candidates who do not require assessment arrangements. This majority of learners (and their teachers and lecturers) will become used to and skilled at using technology and will increasingly expect to use digital technology for internal and external assessments.

---

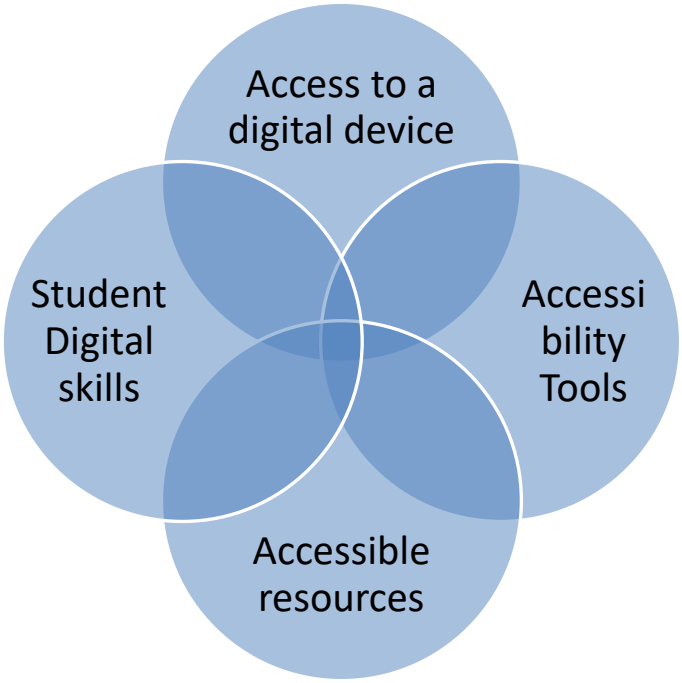
[16] Glasgow City Council (2018) Digital Glasgow Strategy. Available at: https://www.glasgow.gov.uk/councillorsandcommittees/viewSelectedDocument.asp?c=P62AFQDN2UUTDNUT81. Accessed 18/10/21.
[17] Scottish Borders Council (2019) Inspire Learning FAQs. Available at: https://www.scotborders.gov.uk/info/20009/schools_and_learning/914/inspire_learning_faqs. Accessed 18/10/21.
[18] City of Edinburgh Council (2021) Digital boost for pupils with 39,000 iPads in 1:1 roll out. 1/4/21. Accessed 18/10/21.
[19] Seith, E. (2020) Over 40% of councils opt out of national laptop scheme, TES 18/8/20.
[20] Scottish Government (2020) Helping families get online, 24/11/20
[21] Scottish Government (2021) Funding provided for laptops for school children: FOI release. Accessed 14/7/21.
[22] SNP (2021) A laptop or tablet for every school child. 28/3/21. Accessed 9/7/21.
[23] Scottish Government (2021) Devices for 700,000 children. 16/8/21. Accessed 18/10/21.
[24] SQA (2019) Assessment Arrangements Explained: Information for centres. Accessed 9/7/21.

Improved accessibility tools in mainstream technology

Assistive technology offers huge potential for learners with disabilities or additional support needs: "*When a person finds the appropriate AT, they are able to complete tasks that they previously could not complete, did slowly, or did poorly. The right AT augments, bypasses, or compensates for a disability*"[25].

Four components are required to unlock this potential:

- access to digital device(s);
- accessibility tools and options on the device;
- teachers and a curriculum that embrace digital learning, with accessible learning resources;
- students' digital skills and literacy.



Accessibility tools in devices

The built-in accessibility options and tools that are now available to all devices in use in schools – Windows, iOS and Chromebook – coupled with 1:1 technology programs and adoption of digital teaching and learning mean that more learners with disabilities or ASN have immediate access to assistive technology.

When Digital Question Papers were first offered by SQA in 2008, iPads and Chromebooks did not exist and the accessibility tools available as standard on Windows 7 and Microsoft Office were relatively basic, their existence largely unknown and they were not commonly used by students. In 2021, the built-in accessibility tools on all devices have greatly improved and this has been complemented by the development of accessibility tools such as Microsoft's Immersive Reader and free computer dictation systems. What was once specialist, often costly, and required expertise to install and set up, is now generally available immediately to any learner. There is still a

[25] Edyburn, D.L. (2020) Rapid literature review on assistive technology in education: Research report. Accessed 9/7/21.

requirement for additional tools – for example, Microsoft Windows 10 still lacks a general-purpose text reader that can be used across all applications and formats – but huge improvements have been made. The table below gives some examples.

Table 1: Assistive Technologies built-in to devices

Assistive Technology	Windows OS	iOS	Chromebook
Computer Text Reader	Narrator Immersive Reader	Speak Selection	Select and Speak
Screen reader	Narrator	VoiceOver	ChromeVox
Large Text	Make Text / Everything Bigger. Immersive Reader	Bold / Large Text.	-
Zoom / magnify	Magnifier	Magnifier	Magnifier
Colour	High contrast, colour filters. Immersive Reader	High contrast, smart invert colour filters.	High contrast.
Computer Dictation	Microsoft Dictate	Siri Dictation	Google Voice typing
Spellcheck	Yes	Yes	Yes
Predictive text	Yes	Yes	Yes
AutoCorrect	Yes	Yes	Yes
On-screen keyboard	Yes	Yes	Yes
Keyboard shortcuts / navigation	Yes	Yes	Yes
Mouse / pointing device access	Yes	Yes	Yes
Switch access	Yes	Yes	No
Eye-gaze access	Yes	Yes	No

Accessibility tools in software and apps

As well as being built-in to device operating systems, accessibility and support tools are also components of internet browsers and online and offline applications such as Microsoft Office 365, Google Classroom and Adobe Reader. Microsoft's Learning Tools and Immersive Reader are two of the most effective supports[26] and are built into Microsoft Office 365 (both online and offline). Feedback from teachers, lecturers, learners and parents, and published reports indicate that learners have developed skills in using these tools during 2020-21:

"*Staff identify and use various features of Microsoft Teams well to make learning materials more accessible for young people with additional support needs. For example, young people with dyslexia are encouraged to use the immersive reader feature. Other tools such as changing the page colour or grammar tools are also being used effectively to support young people. Staff have published a helpful guide for young people and parents with information on how to access and use these features*."

Crieff High School, Perth and Kinross Council, reported in National overview of practice in remote learning 4[27].

[26] Microsoft (2021) Digital Learning Tools from Microsoft Education. Accessed 21/7/21.
[27] Education Scotland (2021) National overview of practice in remote learning 4: Schools: a focus on meeting learning needs, including those with additional needs.

The online versions of these tools have the advantage that they can be used by learners across different devices so they provide a consistency of function, interface and user experience.

Immersive Reader, for example, enables a learner to:

- customise text size, spacing and background colour;
- apply a reading ruler to improve readability;
- see and hear pictures for common words;
- Highlight nouns, verbs, adjectives and adverbs;
- read text aloud;
- translate content in real time;
- Split words into syllables.

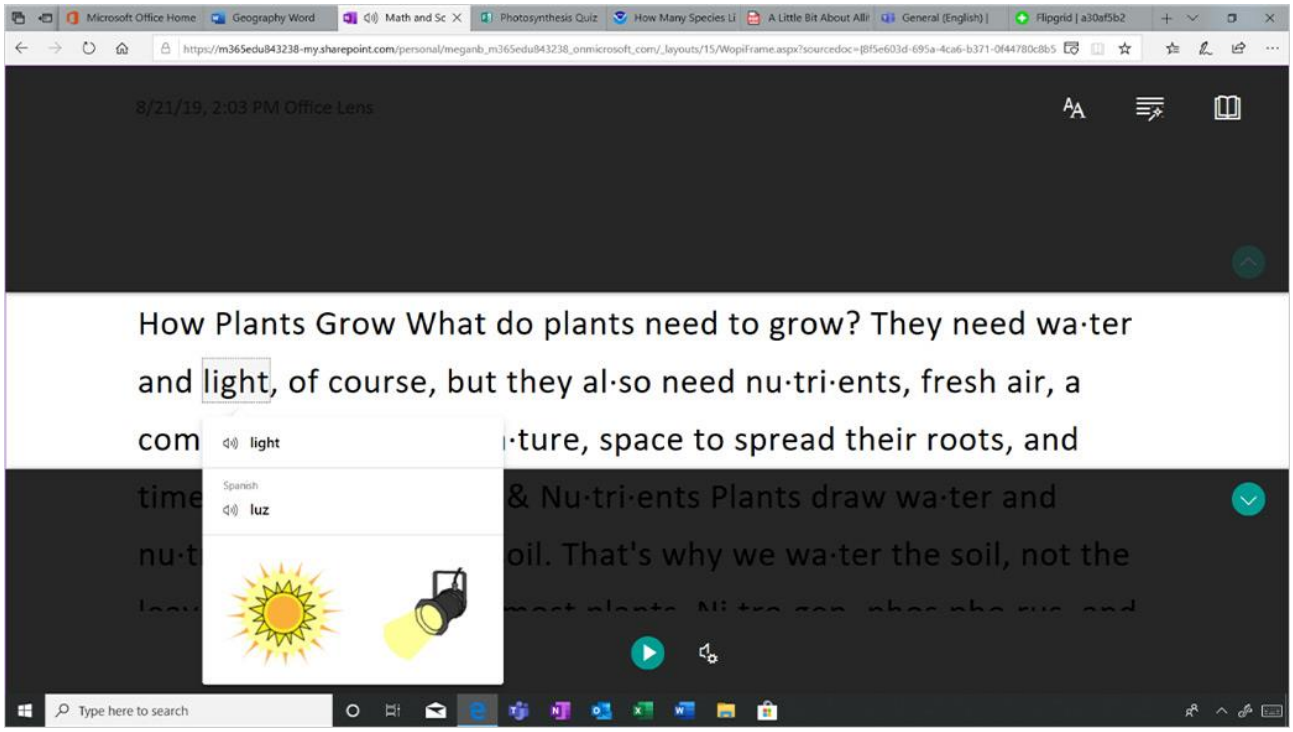


Figure 1:Microsoft Immersive Reader

Individual software tools or apps have their own support tools. For example, Microsoft Word 365 offers both Learning Tools and Immersive Reader and a range of other aids to reading, writing and study such as:

- Editor, which provides a (talking) spelling and grammar checker and suggestions on how to improve clarity and conciseness;
- Dictate, for dictation and transcription;
- thesaurus (with read aloud);
- a translation tool;
- internet search, research and citation tools.

This combination of the accessibility options in devices, software, browsers and apps now offer excellent support for learners with additional support needs who have difficulties with spelling or writing.

Computer Dictation

A common topic that arose in discussion with practitioners was the use of computer dictation for assessments. Colleagues were looking for advice because of difficulties in finding staff to scribe; because modern digital devices all offer free, built-in speech-to-text or computer dictation tools, and because more learners are using these tools at home and in class. We posted *Technology-based Assessment Arrangements - Speech to Text Alternatives to Scribes*[28] to give practitioners an overview of this topic.

Windows

Most schools that use Windows devices now have Windows 10, and the dictation options are:

- **Windows Speech Recognition**. This tool is built into Windows and can be used to dictate into almost any application. It does not require an internet connection, is relatively old technology and the accuracy of the tool is inferior to the more modern speech-to-text systems. It requires training (of the software) and we do not recommend it.
- **Windows Dictation**. Dictation is a new tool for Windows 10 and requires an internet connection. To start dictating, place the cursor where you want to type and press the Windows Key + H to open the dictation toolbar. It seems that Dictation is more accurate than the older Windows Speech Recognition. Dictation can be used to dictate into question and answer SQA DQPs.
- **Dictate in Microsoft Office 365**. Dictate is familiar to teachers or learners who use Office in both online and app forms and like Dictation, requires an internet connection. Learners can use Dictate in Word, Outlook, OneNote and PowerPoint but not Forms. If you open a PDF Digital Paper in Microsoft Edge you can use Dictate to dictate into answer boxes.
- **Dragon NaturallySpeaking**. Dragon is one of the very first speech recognition systems and it is accurate, gives hands-free control, has many useful features and is a paid-for product. It is software that has to be installed on the PC and it does not require internet. SQA provide **guidance on the use of Dragon in examinations**. Dragon is becoming increasingly expensive and difficult to install on school systems.
- **Google Voice Typing** provides dictation in Google Docs online. We hear anecdotal evidence that it seems to function well with Scottish accents which have historically been problematic for speech recognition systems.

iOS

iPads have **Siri Dictation** built-in. Older iPads and iPhones require an internet connection for Siri dictation to work, but newer iPads (including the devices rolled out in Glasgow and Scottish Borders) have **Voice Control**, which provides dictation without an internet connection.

Siri and Voice Control Dictation can be used to dictate into almost any app including Office 365 apps, Google Docs, Microsoft Forms, and SQA Digital Question Papers, provided the learner has an app such as PDF Expert or ClaroPDF that permits text to be entered into the answer boxes.

Practitioners report that Siri is easy to use and fairly accurate.

---

[28] Nisbet, P. (2020) Technology-based Assessment Arrangements - Speech to Text Alternatives to Scribes.

Chromebooks

Chromebooks offer **Voice Typing** which is available in Google Docs, and **Dictation** which can be used to dictate into almost any application or web page. Both require an internet connection. We have heard positive reports about Voice typing and Google Dictation.

Computer Dictation in 2020-21 internal assessments

The modern dictation tools such as Microsoft Dictate, Siri and Google Voice Typing are free, simple and increasingly accurate and accessible. Feedback from colleagues is that the systems offer a viable method of typing for some learners. iOS Voice Control and Dragon do not require an internet connection and both can be used to dictate into any word processor or application. The other systems do require an internet connection.

Questions from practitioners that were raised during discussions included:

- Is computer dictation regarded as an Assessment Arrangement for internal assessments?
- Can learners use internet-based computer dictation tools? If so, how can devices be configured to meet SQA policies on security?
- What type of evidence is needed to support the use of computer dictation as an assessment arrangement?

Computer Dictation in future assessments

CALL Scotland[29] and SQA developed guidance on the use of Dragon NaturallySpeaking for external examinations[30] but this was written in 2015 and there is a need to research and provide up to date policy and guidance on the use of the modern computer dictation tools for assessments to address these questions.

Most of the computer dictation tools function over the internet and so it is necessary to investigate whether there are considerations for security in assessments.

Computer dictation places greater cognitive, linguistic and of course technical demand on learners compared to a human scribe: students must learn to compose accurate English, speak clearly and accurately, and have a method of proof-reading to identify and correct recognition errors. A human scribe is far more interactive and supportive.

[29] CALL Scotland Dragon NaturallySpeaking 13 in SQA Examinations
[30] SQA Speech Recognition Software in SQA Examinations and Assessments.

Assessment Arrangements in 2020-2021

Formal examinations in 2020 and 2021 were cancelled and teachers and lecturers conducted internal assessments in class to gather evidence of attainment. Students with disabilities or additional support needs who require support should be provided with suitable Assessment Arrangements (AA) which "*allow candidates who are disabled, and/or have been identified as having additional support needs, access to appropriate arrangements to complete the assessment without compromising its integrity*" [31].

For 2020-21, SQA advised that centres should "*continue to use the same assessment arrangements processes already in place in your centre to support candidates requiring an assessment arrangement for an internal assessment*" and that "*Centres do not need to submit assessment arrangement requests to SQA for National Qualifications in 2020-21*"[32].

To understand the nature of supports employed by learners with disabilities or additional support needs it is informative to consider requests for AA prior to the pandemic (Table 2). Information on assessment arrangements for 2020 and 2021 is of course not available as the examinations were cancelled.

In 2019, extra time and separate accommodation were the most common types of support requested, followed by use of ICT (17,032 requests; 27% of AA requests). Support from staff to read, scribe, prompt or otherwise help students in assessments is a common assessment arrangement in many schools: there were 9,884 requests for a reader (16% of AA requests), 5,818 requests for a scribe (9%) and 2,302 requests for use of a prompter (6%) in the 2019 SQA examinations[33].

Table 2: Requests for Assessment Arrangements 2017-2019

Assessment arrangements requested:	**2017/18**	**2018/19**	**% of Total AA**
Extra time	44,111	46,920	75.1%
Separate accommodation	35,098	39,045	62.5%
ICT with word processor with spellchecker	10,118	10,852	17.4%
Reader	9,342	9,884	15.8%
Digital question paper	5,715	6,014	9.6%
ICT with word processor without spellchecker	5,179	5,874	9.4%
Scribe	5,715	5,818	9.3%
Coloured Paper	2,964	4,071	6.5%
Rest period(s)	2,716	3,078	4.9%
Prompter	2,173	2,302	3.7%
Supervised break(s)	1,616	1,918	3.1%
Enlarged print	1,059	1,309	2.1%
Transcription with correction	662	566	0.9%
Non standard paper size	445	525	0.8%
Modified content	389	451	0.7%
Non standard paper font	246	388	0.6%

[31] SQA (2020) About assessment arrangements. Accessed 9/7/21.
[32] SQA (2021) Assessment arrangements in 2020-21. Accessed 9/7/21.
[33] Nisbet, P. (2020) SQA Publish Information on Assessment Arrangements for the 2019 Diet. 2/3/20.

Transcription without correction	334	375	0.6%
ICT with handheld spellchecker	284	306	0.5%
Calculator	248	298	0.5%
Enlarged certificate	53	42	0.1%
Non standard paper orientation	42	36	0.1%
Signed to candidate	48	36	0.1%
Braille	27	34	0.1%
Referral to Principal Assessor	52	34	0.1%
Braille certificate	25	30	0.0%
Candidate signs	32	21	0.0%
Live presentation	38	21	0.0%
Total	**128,731**	**140,248**	
Any other arrangement(s)	1,557	1,872	
Total number of AA requests	**57,198**	**62,506**	

Support to read and access question papers

A range of supports are available to help learners who have difficulty in accessing a standard printed question paper. The most common support in 2019 was a human reader/prompter and SQA can also provide papers in an enlarged or alternative font, on coloured paper, in braille, or in digital format. Some candidates use Digital Question Paper and a computer text reader in preference to a human reader. There were 9,884 requests for a reader compared to 6,014 requests for a DQP in 2019. Of these, the number of instances where a candidate intended to use a computer reader is unknown because this information was not captured consistently by the AAR system. We understand that some colleagues request a human reader when planning to use a computer reader as contingency should the technology fail, but it is likely that use of human readers was still more common than use of computer readers in external examinations.

Further evidence is available from an analysis of 2018 requests undertaken on AA requests provided to the author by SQA. This indicated that 90% of Scottish state schools made requests for human readers, while only 59% submitted requests for DQP[34]. The analysis also revealed that 94% of Scottish state schools requested use of ICT, indicating that most centres in Scotland are experienced with using ICT as an Assessment Arrangement but a significant proportion have not developed processes for using DQPs for students to use when reading the question paper.

Support to write responses

Technology-based approaches were the most common type of support for writing or generating responses to be requested in 2019: there were a total of either 17,032 or 23,046 requests for technology-based arrangements compared to 5,818 requests for a scribe and 941 for transcription. (Previous SQA information on AAR requests provided to the author included requests for DQP as a subset of ICT requests, so we assume that this is the case for the 2019, and hence we calculate technology-based requests to total 17,032.)

While use of ICT to support writing was therefore more common than scribes, some students still required support from a scribe to address physical, handwriting, spelling or visual challenges.

[34] Nisbet, P. (2018) SQA Digital Question Papers Focus Group 2018. 5/12/18.

Impact of Covid-19 on assessment arrangements in 2020-21

CALL Scotland's partnership framework with SQA includes provision of advice and support to centres, and through this we engaged directly in email, telephone and video discussions with seventeen colleagues in seven local authorities, one college lecturer and two parents. This is a very small number of individuals and research on a larger scale is necessary to get an accurate picture of the impact of Covid-19 and the ACM on learners with disabilities or additional support needs.

Workforce and environment

We know that many learners with ASN are supported in class and during assessments and examinations by staff who read, prompt, scribe or provide practical help. With regard to technology-based assessment arrangements, practitioners are involved in the identification of appropriate assistive technology, mentoring and teaching of students, and support during assessments, while technical input is needed to physically set up technology suites and configure devices to meet security requirements.

In some schools, colleagues report that support for learners in class during 2020-21 was impacted by reduced staffing levels and/or altered working practices.

- In class, support staff were restricted to working in one class bubble and therefore not able to support learners in a different class.
- Peripatetic staff (for example, Qualified Teachers of Visually Impaired or Hearing Impaired students) were restricted in terms of the number and frequency of schools and contacts that they were permitted to visit.
- Staffing levels may have been reduced because practitioners were unwell or self-isolating (for example 2,184 staff were absent due to Covid-19 related reasons on 8/12/20; 1,432 on 23/4/21).
- In many schools it was not possible to run internal assessments for National 5, Higher and Advanced Higher for whole year groups because classes were not permitted to mix or because social distancing limited the number of students that could be accommodated in gym or assembly halls.
- Students were absent from school due to illness or the need to isolate and so assessments had to be repeated or conducted remotely.

Increase in the number of individual assessment events

SQA guidance for gathering evidence advised that evidence of attainment could be drawn from:

- "*Prelims or mock exams*
- *SQA specimen question papers or past papers*
- *Commercially-produced question papers/assessments*
- *Class tests*
- *Classwork*
- *Completed or partially-completed coursework*

- *Performance evidence*" [35]

and that prelims or mock exams are "*likely to be the most reliable indicator of performance in a question paper, particularly if they are undertaken in the same conditions as the question paper*".

The Education Scotland report into local authority approaches to quality assurance notes variation in assessment practices across the country:

"*Local authorities have supported schools to implement assessment approaches flexibly to suit their local context whilst working within a national framework. This local flexibility has resulted inevitably in variation in approach across schools and local authorities*." and local authorities "*encourage the use of assessments within class time*" ([36] p. 4).

Colleagues report that teachers and lecturers therefore devised assessments, sometimes based in whole or in part on the question papers available from SQA, but that it was not possible to administer these assessments on a single assessment session due to the restrictions described previously. For example, in 2019 the National 5 English examination comprised a 60-minute *Reading for Understanding, Analysis and Evaluation* paper and a 90-minute *Critical Reading* paper (longer for students who require Extra Time, the most commonly requested type of assessment arrangement) which almost all students sat on the morning of Thursday May 9. This year, where teachers used the National 5 English question papers from SQA, it was not possible to conduct these assessments in a single 50 minute or double class period and so assessments were sub-divided and scheduled across several different times and dates. In a situation such as this, students may have undertaken a larger number of shorter assessments than would be the case in the usual examination diet.

It was also reported that "*in some schools, there were two "assessment windows", with the SQA's 2020 paper being sat in one and a school-designed paper sat in the other.*"[37]

Consequently, the organisation of assessment arrangements for learners may have presented a larger and more complex task for ASN and Support for Learning staff and subject teachers. One Principal Teacher of Support for Learning reported that there were 556 assessment sessions where students required Assessment Arrangements compared to 278 in 2019. Another colleague reported that "*usually I have around 100 to 150 AA accommodations to manage. This Window has 350 separate accommodations. I have a two week window before we do the whole thing again for Window 2. Workload is HUGE*."

A potentially larger number assessments may have led to a significant increase in workload for ASL and Support for Learning staff because extra time, readers, scribes and/or technology had to be identified, organised and provided on many more instances. The task was further compounded by staff shortage or limitations on how support was able to be provided, as discussed in the previous section.

Given these challenges there could be concerns about whether suitable assessment arrangements were made available for learners with disabilities or additional supports needs, although since "*assessment arrangements should reflect, as far as possible, the candidate's normal way of*

---

[35] SQA (2020) National Courses: guidance on gathering evidence and producing estimates. October 2020, Publication Code BBB8283. Accessed 9/7/21.
[36] Education Scotland (2021) National Review of local authority approaches to quality assurance as part of the alternative certification model. Accessed 9/8/21.
[37] TES (2021) SQA results 2021: Don't scrap exams in push for change. TES 8/8/21.

learning and producing work"[24], we might hope that routine support was available in class for assessments.

One ground for appeal in 2020-2021 is where a "*school, college or training provider failed to provide agreed Assessment Arrangements*"[38] and so analysis of the number and nature of appeals received where this factor is cited may provide an indication of whether the challenges of providing suitable support were met.

Technology-based internal assessments in 2020-2021

The discussions with colleagues in schools suggest that the growth in digital learning, coupled with staff shortages and an increase in complexity of providing support for assessments, drove greater use of technology-based assessment arrangements in the autumn term of 2020. Over lockdown, learners may not have had support to help them read learning resources or scribe their responses[8] and so investigated computer reader and computer dictation technologies.

This continues the trend since Digital Question Papers (DQPs) were first offered in 2008, but Covid-19 and the increase in use of digital technology during lockdown may have accelerated this process.

Some colleagues reported a change of practice for assessments held in the summer 2021 term compared to internal assessments that had been conducted earlier in the year. Some teachers and lecturers, particularly in schools and colleges with greater access to personal technologies (usually, schools with 1:1 iPads or Chromebooks) had used a range of technology-based assessment methods to gather evidence from all learners while schools were open in the autumn term of 2020. However, the impression given during the investigation is that practitioners did not consider that the evidence provided by these internal assessments met SQA guidance on validity and reliability and therefore adopted more traditional assessment approaches - i.e. question papers provided by SQA - to gather evidence of demonstrated attainment.

Results from an SSTA survey in May 2021 support this view: "*64% of teachers used the exemplar exam papers in full provided by the SQA with a further 33% used parts of the papers*." [39]

If the SSTA survey is representative, it suggests that 99% of staff used the SQA papers in whole or in part, and as discussed in this paper, there were considerable technical and logistical challenges associated with accessing SQA DQPs on iPads and Chromebooks. The evidence from colleagues suggests that the majority of students were provided with paper-based assessments in the summer term and technology was more commonly used by learners who required it as an assessment arrangement.

However, we do not have comprehensive evidence for this observation – it is based on a small number of conversations with colleagues in schools and centres – and so it is important to conduct research into how assessments were administered in general, and particularly, the nature of assessment arrangements that were actually used by learners in assessments for 2020-21 National Qualifications.

With regard to use of technology during the summer 2021 assessments, some colleagues reported challenges in locating sufficient number of computers or laptops: centres often use machines in

[38] SQA (2021) Appeals 2021 - Information for learners. Accessed 9/8/21.
[39] SSTA (2021) SSTA Survey – Alternative Certification Model (ACM) – May 2021.

computing or business labs or the library for assessments and these were harder to timetable because S4 to S6 students were in school following a standard timetable rather than at home on study leave. One Principal Teacher said that "*We are not allowed invigilators (not sure why as we can have supply teachers in school), therefore I am not only acting as PT SfL, but also as a technician, loading/printing secure logins, but invigilator too. The pressure is immense and I am feeling extremely stressed*."

While we might have hoped that the roll-out of 1:1 iPads and Chromebooks in some local authority areas would have improved access to technology for assessments in 2020-21, difficulties of accessing question papers in PDF on iPads and Chromebooks, and uncertainty or difficulty in meeting security requirements suggests that practitioners instead reverted to using Windows-based laptops and desktops.

As noted above, these observations are drawn from conversations with a small number of teachers and lecturers. Broader and more detailed research is required to understand how learners with disabilities or additional support were supported during assessments for National Qualifications in 2020-21. Most Support for Learning departments create detailed timetables of the type of support required by each student and each assessment as part of the operational process, and to meet SQA requirements ("*You should keep a record of your decisions and any evidence that supports them*."[32]) and because a failure to provide agreed assessment arrangements may be grounds for an appeal[40]. Research to collate and analyse a sample of such assessment arrangement records would provide valuable information of the type of support used by learners with disabilities or additional support needs in 2020-21 and would be helpful in considering how assessment at the Senior Phase can be developed, particularly in light of the recommendations on senior phase assessment from the OECD Review of Curriculum for Excellence[41].

Production of Assessments

Teachers and lecturers were offered question papers to use in whole or in part and where assessments were conducted over several sessions in class, practitioners may have sub-divided papers into separate sections. For paper-based assessment sessions, this could be achieved through photocopying but different methods were needed to sub-divide papers for students who require digital assessments and so we developed advice on the topic in a blog post[42].

For staff who created bespoke assessments, SQA's Assessment Resources web page[14] provided instructional videos showing how to copy questions from a PDF of a question paper and paste into a word processor however it was acknowledged on the page that this process did not create a resource that would be accessible for many students with disabilities or additional supports needs. We provided supplementary advice on creating accessible resources in a blog post on 7/1/21[43].

The 2021 question papers and past papers provided by SQA were PDF files and while they can be edited using packages such as Adobe Acrobat Professional, the software must be purchased and installed and there are significant limitations with what can be achieved because PDF is not

---

[40] SQA (2021). Appeals 2021 - Information for learners. Accessed 9/7/21.
[41] OECD (2021), Scotland's Curriculum for Excellence: Into the Future, Implementing Education Policies, OECD Publishing, Paris, https://doi.org/10.1787/bf624417-en.
[42] Nisbet, P. (2021) How to Divide and Edit SQA Question Papers.
[43] Nisbet, P. (2021) Technology-based Assessment Arrangements - Digital Assessments Must be Accessible.

designed to be an editable format. Lack of access to PDF editing software, limitations in what can be accomplished with it, and poor options for converting PDFs into more editable formats may have influenced teachers' and lecturers' decisions on whether to use paper or digital assessments, and whether to use the SQA assessment resources in whole rather than to create bespoke assessments.

One topic of investigation with colleagues in centres was the type of digital format that teachers and lecturers used to create and administer assessments: since teachers and lecturers could create their own assessments, there was the option to use digital formats that were more suited to digital delivery. Digital Question Papers in PDF are digital versions of resources originally designed for students to access on paper: they are not specifically designed for the digital medium. Some colleagues felt that practitioners used Google or Microsoft Forms or word processor formats such as Google Docs or Microsoft Word but the general impression was that PDF was more commonly used during the summer term assessments and this is borne out by the SSTA survey results[39]. We discuss digital assessment formats later in this document and in a blog post on *Technology-based Assessment Arrangements - Which Digital Formats*[44].

[44] Nisbet, P. (2021) Technology-based Assessment Arrangements - Which Digital Formats?

Technologies in schools and centres

In this section we summarise the status of Windows, iOS and Chrome operating systems with regard to their use with DQPs and DABs, as part of an assessment arrangement in 2020-2021, and going forward.

Windows

Devices running the Windows OS were the most common type of device in use in Scottish schools until relatively recently and Windows is still the default OS in many local authorities. There has been a slow upgrade to Windows 10 in some local authorities and some schools were still using devices with Windows 7 at the end of the 2020-21 academic session, even though support for Windows 7 ended on January 14, 2020.

Windows 10, as discussed previously, has improved accessibility and learning support tools built into the operating system compared to Windows 7. Similarly, Microsoft Office 365 has superior tools such as Immersive Reader, Dictate, a talking spellchecker, etc compared to Office 2016. However, colleagues have indicated that the older Office 2016 is still provided on school computers in several local authorities and so these tools are not available.

Digital Question Papers

The DQPs were originally devised for and piloted on Windows devices and in general it appears that they function as effectively as ever. Centres generally use the free Adobe Reader or Foxit Reader software to access DQPs. These both have a built-in text reader but most centres opt to use a third-party tool such as Natural Reader. Most installed Windows text readers can read with the free Scottish computer voices[45] available from CALL Scotland. Candidates can type into answer boxes and annotate and draw on the digital papers.

Microsoft's Immersive Reader provides an excellent tool for supporting access to text and has altered the technical context. It was clear from discussions that practitioners were interested in using Immersive Reader to enable access to SQA DQPs and so we conducted some tests and reported results in a blog[44]. DQPs can be opened with Microsoft Word 365, but when viewed in Immersive Reader the page layout fails and students cannot use the answer boxes / form fields. PDFs, including DQPs, can be accessed with Immersive Reader through the Microsoft Edge web browser, but the text reader is hard to control; page or text colours cannot be adjusted; and while students can type into answer boxes, there is no spellcheck function. It is unfortunate that Immersive Reader does not function well with PDFs and DQPs, because it does seem to be offer a particularly helpful support for students with additional support needs.

Lastly, the Read Aloud text reader provided in Immersive Reader cannot read with the Scottish computer voices.

Digital Answer Booklets

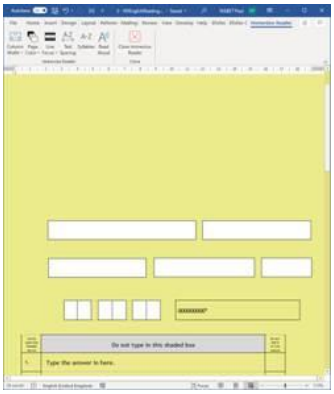
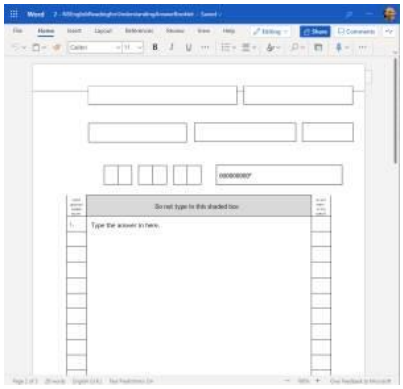
DABs were also originally developed for Windows OS and are provided as PDFs and .docx files, the latter to be accessed using Microsoft Word. Evidence from meetings of the Digital Papers

[45] CALL Scotland (2021) Scottish digital voices. Accessed 14/7/21.

Focus Group suggests that .docx DABs are more commonly used than PDF.

One limitation of the current DABS in .docx format is that the layout of the front page fails when opened when using Immersive Reader in the Word desktop app and in Word 365 online.

Table 3: .docx DABs

 *SQA DAB in Word 365 desktop on Windows – the front page displays correctly in Print Layout View.*	 *SQA DAB in Word 365 desktop with Immersive Reader – front page layout fails.*	 *SQA DAB in Word Online – front page layout fails.*

The current DAB design is also not accessible for learners who use screen readers and we suggest that consideration is given to creating DABs that are accessible and that function correctly on all commonly used devices and tools. The *Accessible Word Templates for 2021 National Qualifications* blog post[46] and *Create An Assessment with Microsoft Word* web page[47] have examples and more detailed guidance.

Summary

SQA DQPs and DABs were originally designed for use with Windows devices and still provide an effective resource for many students who wish to use technology as an assessment arrangement. However, technology and technical environments have changed significantly in recent years and we suggest it is necessary to review policies around internet access, security and administration of assessments to reflect the current context in centres.

Microsoft's Immersive Reader is becoming an effective Windows and cross-platform tool but cannot be used to satisfactorily access question and answer DQPs.

The .docx DABs should be re-designed to function correctly with Immersive Reader in Word and Google Docs.

[46] Nisbet, P. (2021) Accessible Word Templates for 2021 National Qualifications.
[47] Nisbet, P. (2021) Create An Assessment with Microsoft Word.

iOS and iPads for Assessment Arrangements

Some schools in Scotland have invested in iPads on a 1:1 basis for all learners or for learners with additional support needs, while others have purchased sets of devices for shared use. Prior to the pandemic, Glasgow and Scottish Borders had begun provisioning iPads to all learners in P6 and above and the roll-out was accelerated as a result of the situation. City of Edinburgh announced a similar initiative in April 2021[48].

Had Covid-19 had not occurred and external examinations gone ahead, it is likely that most centres would have continued to use Windows laptops and desktops for assessment arrangements. However, the iPad roll-out and the reliance on internal assessments to gather evidence meant that staff in Glasgow and Scottish Borders iPads have explored the use of iPads for assessments in general, and as assessment arrangements for learners with disabilities or additional support needs, particularly in the autumn term of 2020. It is not clear whether students did use iPads as assessment arrangements during the summer 2021 term: comments from colleagues suggest this was rare due to the difficulties of restricting access to the internet while managing distribution and printing of assessments, disabling literacy support tools such as spellcheck or dictionary to meet SQA requirements, and lack of a suitable app for accessing question and answer DQPs.

iPads and Digital Question Papers

Question-only DQPs can be accessed using many different iOS apps including the free Apple Books tool. While students can use Books to type into answer boxes, it is not a practical solution[49] and students require an app with suitable functionality such as *PDF Expert* or *ClaroPDF*[50]. However, colleagues report that neither of these were available on the iPads provided to students in Glasgow and Scottish Borders and the Books app does not appear to be available for iPads in Edinburgh. Students may therefore view a question paper but required a word processor or other app to write answers. This issue was raised directly with contacts in Glasgow and Scottish Borders. Both *PDF Expert* and *ClaroPDF* are available as free apps and so there is no cost to making them available other than the security and data protection process, which is where the challenge appears to have arisen. The iPad provision is managed by CGI and learners and staff have access to a restricted set of apps is provided through the Self Service function[51]. We understand that apps must be evaluated and undergo a Data Protection Impact Assessment (DPIA)[52] prior to being added to Self Service: this process takes time and it is not clear whether these apps were evaluated or not or whether they failed the DPIA process.

iPads and Digital Answer Booklets

DABs in PDF can be access using *PDF Expert* or *ClaroPDF* but these were not available on the managed iPads in Glasgow or Scottish Borders. DABs in .docx format can be accessed on iPad with the Word app.

---

[48] Say, M (2021) Edinburgh Council to give iPads to schoolchildren. Accessed 14/7/21.
[49] Nisbet, P. (2021) Technology-based Assessment Arrangements - SQA Digital Exams on iPad.
[50] CALL Scotland (2020) Reading Digital Papers
[51] Glasgow City Council Remote Deployment: Early Years and Teacher iPads. Accessed 14/7/21.
[52] Information Commissioner's Office. Data Protection Impact Assessment. Accessed 14/7/21.

iPads and SOLAR

SOLAR is '*SQA's free online e-assessment system*'[53] that provides assessment resources and a process was created to use it to verify and share assessments[54]. Access to the resources on an iPad requires the Surpass app which colleagues reported was not available for Glasgow iPads from Self Service. In this case, however, discussions with colleagues in Glasgow proved fruitful and the app was made available in January 2021.

Scottish and Gaelic computer voices on iOS

One limitation of iPads is that Scottish English and Scottish Gaelic computer voices are not provided within iOS and it is not possible to install the voices from CALL Scotland either. Therefore learners in Glasgow or Scottish Borders cannot read digital assessments with a Scottish voice, and students at Glasgow Gaelic School cannot use the built-in iPad text-to-speech for Gaelic Medium assessments.

The Scottish voices can be built into specific apps, however, and CALL has negotiated this with some developers of apps for learners with communication support needs[55].

We have had discussions with developers at Claro Software, the UK-based developer of ClaroPDF, around integrating the Scottish and Gaelic voices into the app. Claro already offer the *Andrew* and *Mairi* Scottish child voices in their ScanPen app and so it is technically possible.

Given the potential size of the user base and market (>50,000 iPads in Glasgow, plus Scottish Borders and now Edinburgh), it would be advantageous for Claro and obviously, for students and staff, if these discussions led to the Scottish voices becoming available on the Claro apps.

Summary

There are good apps and tools for students to use to access DQPs and DABs using iPads, but question and answer DQPs require use of an app such as PDF Expert or ClaroPDF. Some students have access to these, but the apps are not currently available through the large scale provisions in Glasgow, Scottish Borders or City of Edinburgh. There is a need to liaise with officials in the local authority and CGI, the company that manages the technology, to arrange one or both of these apps to be made available.

There are challenges around technical administration of assessments: the devices need to be connected to cloud storage and processes for configuring devices to disable spellcheck or other support tools are not well-developed. SQA might therefore consider reviewing current policies around internet access in co-operation with colleagues in schools and local authorities.

The incentive to address these issues arises not only from a requirement to meet the needs of learners with disabilities or additional support needs: there are far more students who do not need assessment arrangements and who will wish to use iPads to type their answers in examinations.

---

[53] SQA (2021) About SOLAR
[54] SQA (2021) Making ASPs available in SOLAR.
[55] CALL Scotland (2021) Communication aids. Accessed 15/7/21.

Chromebooks for Assessment Arrangements

As noted previously, Chromebooks are being supplied to all learners in some local authorities and were also distributed through the Scottish Government laptop scheme. CALL Scotland's 2020 report into the use of Chromebooks for Assessment Arrangements[56] identifies several limitations around the use of Chromebooks for SQA external examinations.

Chromebooks are designed to be more or less permanently connected to the internet and cloud resources such as Google Classroom. This is the only practical way to use them for both internal and external assessments.

It is not clear whether or how centres can disable literacy support tools such as spellcheck or dictionary for assessments.

Chromebooks and Digital Question Papers

Question-only PDFs can be accessed using a range of techniques and PDF viewers on Chromebooks but when we undertook our research in 2019-2020 we could not find satisfactory apps or extensions for accessing Question-and-Answer DQPs. In our research in 2021 we found that some Chromebooks can run Android apps, which gives more options, and the Foxit Reader app has most of the functionality that is required for accessing question-and-answer DQPs. It is not clear whether and how Android apps can be installed on the devices in schools because a) only some Chromebooks can run Android apps[57] and b) the apps are made available by the device administrator. Some local authorities such as Highland and Aberdeen City have their own Google domain and should be able to make these apps available[58] [59] subject to security and data protection compliance. Other local authorities such as Aberdeenshire have Google domains managed by Education Scotland and there is a different process through which apps can be requested and made available[60].

The Scottish Voices cannot be installed on the Chrome OS for reading with text-to-speech but our research this year has revealed that the voices can also be installed as Android apps and that they function with some text reader tools[61].

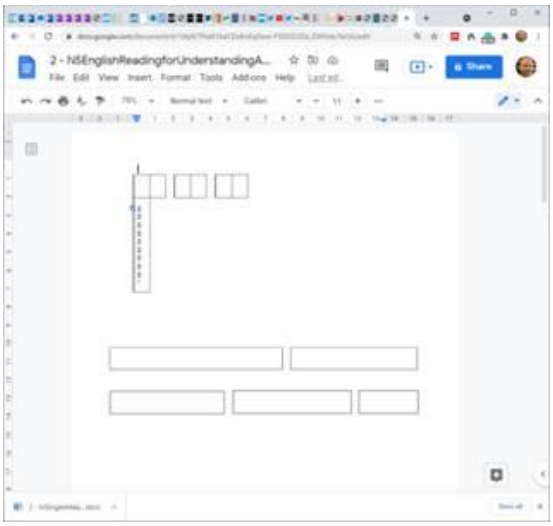
Chromebooks and Digital Answer Booklets

DABs in PDF are a possibility for Chromebook with the Android Foxit Reader app. Digital Answer Booklets in .docx format do not function correctly with Google Docs.

---

[56] Nisbet et al (2020) Chromebooks and SQA Assessment Arrangements
[57] Google (2021) Install Android apps on your Chromebook. Accessed 15/7/21.
[58] Highland Council (2021) How to install and run Microsoft Office on a Chromebook. Accessed 15/7/21.
[59] Google (2021) Deploy Android apps to managed users on Chromebooks. Accessed 15/7/21.
[60] Glow. Apps and Extensions. Accessed 15/7/21.
[61] CALL Scotland (2021) Text Readers. Accessed 15/7/21.

SQA DAB in Word 365 desktop on Windows – layout is accurate



SQA DAB in Google Docs – the front page layout fails

Chromebooks and SOLAR

Chromebooks cannot as standard access assessments on SOLAR[62] but there is now an Android Surpass Viewer app, so this may be a possibility for some Chromebooks.

Summary

In some local authorities Chromebooks are being provided to every learner and are becoming "*the normal way of working*". The devices offer an effective tool for teaching and assessment but there are currently significant technical and administrative challenges with using Chromebooks as assessment arrangements with SQA DQPs and DABs.

Chromebooks are not discussed at all in current SQA guidance on DQPs or Assessment Arrangements. The report available on CALL Scotland's web site[56] identifies some limitations of Chromebooks for DQPs and DABs but does not provide solutions (yet) to many of these limitations. While some progress has been made this year by CALL, SQA and practitioners in schools (e.g. with Android apps for DQPs and the Scottish computer voices) there is an urgent need to:

- review and issue clear guidance around access to internet and cloud storage so that digital assessments can be administered using Chromebooks with cloud storage;
- research and disseminate technical management solutions for assessments;
- work with developers to create tools that can access current question and answer DQPs or develop digital assessments in formats other than PDF.

[62] SQA (2021) About SOLAR

Technology-based Assessment Arrangements moving forward

The research has raised a number of issues that might be considered and addressed for the 2021-22 academic session.

Policies on Internet security

Until recently, most schools and local authorities in Scotland deployed technology running Windows OS and digital storage was provided on servers located within the school. For external examinations and prelims, school technicians typically created 'exam profiles' that allowed candidates to access folders on the school network containing the digital question papers and answer booklets and to print their completed assessments. SQA policy requires access to the internet or to other potential sources of information to be disabled[63].

Over the past few years, school technology has moved away from servers located in school to cloud-based storage such as Microsoft OneDrive, Google Classroom, Showbie or Seesaw. The Covid-19 pandemic, school lockdown, and rapid deployment of digital technology to support learning at home has accelerated this process. For iPads and Chromebooks, it may not be technically possible to connect to the older school-based servers even if they still exist.

In 2021 and thereafter, the only practical method of administering digital assessments is to use cloud-based storage and a new policy on internet access in examinations and assessments should be devised to reflect this reality, and communicated clearly to centres. The policy should allow access to assessments and to any necessary accessibility tools but prevent access to any other internet resources that might compromise the integrity of the assessment. The policy should be researched and developed with consultation with the users of the assessments to ensure that can be implemented across all platforms and devices in use in Scottish schools.

SQA guidance[64] on remote assessment for 2020-21 already permits use of cloud-based storage for remote assessment:

> "*Can I use GLOW or another environment such as Google Classrooms to make an assessment available to candidates?*
>
> *We recognise that academic year 2020–21 is taking place in very challenging circumstances. Most digital learning and assessment environments are technically very secure and can be used to make assessment instruments available to candidates, and to store evidence. However, you will need to consider how you will limit visibility to other candidates and minimise the risk of exposure of any SQA-supplied secure assessment material through that environment."*

We suggest that the same policy should apply to technology support for Assessment Arrangements.

From discussions with colleagues it seems that there is uncertainty about how to:

- meet security requirements and to prevent wider access to the internet;
- disable literacy support tools that may not be permitted, such as spellcheck, thesaurus,

[63] SQA (2019) Digital Question Papers: Technical Guidance pp. 5, 7, 8
[64] SQA (2020) Using technology to support assessment remotely: questions and answers.

dictionary or computer dictation;
- enable selective access to built-in and third-party accessibility tools.

The process for managing technical security varies depending on the:

- devices in use in school (iOS, Windows, Chromebook);
- management software employed in the school, centre or local authority;
- digital format of the assessment (PDF, Word, Microsoft Forms, Google Forms, HTML).

Some colleagues supporting pupils who have personal iPads or Chromebooks reported that these devices were not used for assessments in the 2021 summer term because of uncertainty about or inability to meet the SQA policy on internet security.

In Highland, where the authority have a well established Chromebook provision, some centres have used Securly, a tool that provides restricted internet access and control and monitoring over students' devices. A colleague in the authority estimated that 10 to 12 secondary schools out of 29 used Chromebooks during assessments in 2022-21.

Practitioners in one school in Stirling use Netop Vision, which provides a similar set of controls over the Chromebooks used by students. However, while Chromebooks were used extensively for assessments in the autumn 2020 term, utilising Google Docs and Forms, it seems that learners who required technology-based assessment arrangements utilised Windows machines for the summer assessment diet. The reasons given for this were that the internet bandwidth was felt to be inadequate and unreliable and practitioners were uncertain about meeting SQA security policies. Reliance on Windows-based devices may not be sustainable or practical as the machines age and as Chromebooks become the primary technology used by students. The facilities and user experience of accessing SQA Digital Question Papers and Digital Answer Booklets are different over the two platforms; students are less familiar with Windows and teaching students how to use the Windows-based devices adds to workload.

Discussions were held with colleagues in Glasgow and Scottish Borders where iPads are being provided to all learners in secondary schools and it seems that few learners used iPads as part of an assessment arrangement due to uncertainty regarding distribution of question papers and printing completed responses, given that devices should not have internet access.

For example, in Glasgow colleagues noted that Jamf is used to manage the iPads and teachers have Apple Classroom on their iPads. With Apple Classroom, a teacher can navigate students to a specific URL and lock students into using one app so it may be possible to first give students access to an assessment and then lock the iPads into one app for the duration of the class. This method would not work where students require to use two apps - one to view a PDF question paper and a second app to generate a response. Also, the teachers with whom I have explored this reported that Apple Classroom did not work reliably. Finally, there is a need to test security thoroughly: Jamf advise that "*whitelisting Google resources for assessments may give unintended access to searching the internet*."

In summary, we suggest that the policy restricting all internet access during assessments should be re-considered to reflect the technologies currently used in schools. The investigation suggests that centres are at an early stage of developing expertise in using Chromebooks and iPads under secure conditions, and this expertise should be co-developed with practitioners, technical colleagues and SQA. It is essential that all security arrangements enable access for learners with additional support needs and do not discriminate directly or indirectly under the Equality Act 2010.

Policies on accessibility and support tools

As noted previously, technologies currently used in schools offer accessibility and support tools such as text readers, word prediction and voice dictation, while mainstream word processors provide a range of supports such as spellcheck, thesaurus, dictionary and look-up. These tools are available for all students and colleagues report that they are increasingly being used by all students, not only students with additional support needs. One colleague observed that the 1:1 provision of Chromebooks has had a significant impact upon teaching and learning in general and that many students who would not necessarily qualify for assessment arrangements now expect to use support tools such as spellcheck in assessments. He commented that there is enormous scope for improving teaching and learning through universal design for all, using technology.

Use of literacy tools in assessments

This raises questions around the policies regarding tools such as spellcheck: in a context where almost all leaners are using technology for an assessment, and where spelling accuracy is not assessed in most SQA examination, should the current policy prohibiting spellcheck[63] be changed to only prohibit use of spellcheck in assessments where spelling is assessed?

This question is not restricted to spellcheck and applies to other tools that support reading, writing and numeracy.

Management of literacy tools in assessments

A secondary consideration is around the management of these tools in assessment contexts. SQA provide Digital Question Papers and Answer Booklets as PDF files with ‘spellcheck on’ and ‘spellcheck off’ to help practitioners manage access to spellcheck, but this setting has no effect on spellchecking when the files are accessed on an iPad or Chromebook: the spellcheck is a function of the device and the app used to access the file, not the properties of the file itself.

It is not possible to disable the spellcheck function on a Microsoft Word digital answer booklets and so historically technicians created ‘exam profiles’ for Windows devices where access to such supports is disabled. However, it is clear from discussions with colleagues that equivalent practices are not yet well developed for iPads and Chromebooks, or indeed for the online versions of Microsoft Word or Google Docs.

The situation is made more complex because as discussed previously, support facilities are provided through the device operating system and also within the software or application. On an iPad, for example, disabling the spellcheck on the device has no effect upon the spellcheck facility in the Microsoft Word app. Disabling spellcheck on a Chromebook does not disable the facility in Google Docs because they are separate tools[65]. On a Windows device, disabling spellcheck for the Microsoft Word installed app/software has no effect on the spellcheck provided by Word Online. Further complexity is introduced by online tools such as Office 365 and Google Docs which can be accessed using any of the three major device types.

Formulation of a revised policy on spellcheck and other accessibility and support tools must therefore be informed and developed in cooperation with practitioners and technical colleagues in schools to ensure that the policy can be implemented.

---

[65] Nisbet et al (2020) Chromebooks and SQA Assessment Arrangements. Accessed 14/7/21.

Digital Assessment formats and systems

Digital Question Papers and Answer Booklets in PDF

SQA Digital Question Papers and Answer Booklets are PDF files and have several advantages:

- They can be viewed on all devices in common use in schools and colleges - Chromebook, iOS, Windows.
- The digital version is identical to the printed version.
- Question and answer papers have answer boxes so that students can type answers into the digital paper (provided the device has a suitable app or software).
- They have proven to be reasonably reliable since they were introduced in 2008.
- They are reasonably accessible for learners with additional support needs. The SQA papers can be magnified to enlarge the text and images; with some PDF readers, colours can be adjusted; texts and questions can be read out with a computer text reader; candidates can type into question-and-answer papers.
- They are reasonably secure documents - the candidate cannot accidentally or deliberately alter the questions.
- Basic PDFs are relatively easy to create and most practitioners can generate non-interactive PDFs with readily available tools.

The main disadvantages of current DQPs are:

- The user experience varies across different devices and apps / software. The recent report from Ofqual into the use of assistive technologies for assessment suggests that this is a commonly reported frustration with PDF question papers: "*There were concerns about how reliably and universally these files worked across the range of available ATs*"[66]
- The digital version is identical to the printed version: the assessments are designed to be accessed on paper, not digitally. Some papers are complex to navigate and use on digital devices.
- Accessing question-and-answer papers requires specific apps that are not currently available on iPads or Chromebooks provisioned through large-scale deployment schemes.
- PDFs in general have a poor reputation in terms of accessibility although this is dependent on the authoring process: the SQA DQPs are accessible for many candidates but not for some groups of students. Students with visual impairment who require high magnification may find some papers hard to access because the assessments may not 'reflow' well to fit the screen, especially on tablets with small screens; the DQPs are not accessible for students with blindness or significant visual impairment who use screen readers or braille displays[67]; they are hard to navigate for students with significant physical disabilities who use switches or eye gaze access.
- They are difficult to edit and to adapt to alternative accessible formats.
- Production of interactive question and answer papers requires specialist commercial

[66] Ofqual (2021) The use of assistive technologies for assessment. Accessed 20/6/21.
[67] Nisbet, P. D. (2020). Assistive technologies to access print resources for students with visual impairment: Implications for accommodations in high stakes assessments. British Journal of Visual Impairment, 38(2), 222–247. https://doi.org/10.1177/0264619619899678 Open access accepted author manuscript: https://www.research.ed.ac.uk/portal/files/135008703/ACCEPT_1.PDF

software.

- Options for reading mathematical and scientific expressions with text-to-speech software or braille displays are poor.
- Options for writing or generating mathematical and scientific expressions are limited.
- Technical administration is inefficient and involves distribution of large numbers of individual files to students; responses are then saved, printed, collated and shipped to SQA to be scanned back into a digital format and for marking. Online digital assessment platforms such as SQA SOLAR or the Scottish National Standardised Assessments are much more efficient mechanisms for almost all stakeholders.

Immersive Reader

In many schools and centres, students are making use of Microsoft's Immersive Reader which is available cross platform and within Office apps and desktop tools. These Learning Tools provide a means for students to adapt the appearance of files and to use a computer reader to read the text, and for many students this technology is becoming the 'normal way of working'.

However, PDFs do not work well with Immersive Reader. Students can open a DQP with the Microsoft Edge browser, read it with Read Aloud, and type and save answers, but the user experience is awkward and finicky. Immersive Reader works much better with HTML in Edge or native Microsoft Word files - provided they are accessible and well designed [43].

Drawing, maths and science

Many STEM DQPs are question-and-answer format. While simple mathematical expressions can be typed into the answer boxes on DQPs, typing fractions or algebraic expressions into the PDF answer boxes is not practical. Options for equations and drawing are much better in word processors such as Microsoft Word and Google Docs.

It is not possible to read mathematical expressions in a DQP accurately using a computer text reader. Note that mathematical expressions can be read in digital formats other than PDF when created with Microsoft's Equation Editor[68] or MathML[69].

Possible improvements for DQPs and DABs in PDF

Improve accessibility

Raising the level of accessibility to UKAAF Level 2[70] would help to improve accessibility particularly for blind students who use screen readers or braille displays.

Technical administration

Collaborate with teachers and lecturers to develop and disseminate policies and practices to enable more secure and efficient distribution of files using for example Microsoft Teams or Google

---

[68] Nisbet, P. (2021) How to Read Maths with Immersive Reader.
[69] Frankel, L., Brownstein, B. and Soiffer, N. (2017), Expanding Audio Access to Mathematics Expressions by Students With Visual Impairments via MathML. ETS Research Report Series, 2017: 1-53. https://doi.org/10.1002/ets2.12132
[70] UKAAF (2014) UKAAF minimum standards: Accessible PDFs For Assessment.

Classroom.

SQA distributed DQPs to centres on CDs and CD drives are not typically built into laptops, Chromebooks, iPads or modern desktop computers. Efficient distribution of DQPs therefore requires secure delivery over the internet.

Consider other digital formats

There are several fundamental limitations with the PDF format that cannot be easily addressed:

- the user interface and facilities available varies depending on the device / app / software used by the student so there is a lack of consistency for candidates;
- the DQPs are not accessible for some students;
- there are underlying technical limitations in terms of the assessment items and how students can respond, particularly for STEM subjects.

Given these challenges we suggest that SQA should review the use of PDF and consider other more accessible, more efficient and more secure online systems.

Digital Answer Booklets in .docx format

The current DABs in .docx format can be accessed using Microsoft Word on Windows and iPad and advantages of this format include:

- Students are generally familiar with the word processor.
- Candidates can use the full range of formatting, fonts, sizes, styles, drawing tools etc.
- Candidates can use the built-in Immersive Reader.
- Students' answers flow across pages.
- Candidates can insert mathematical and scientific expressions with the Microsoft Equation Editor, MathType or FX Equation.
- Students can dictate text with the free Dictate tool (if connected to the internet); Dragon is optimised for Word.
- Most writing support tools are designed to work with Word, for example Read&Write, ClaroRead, Ginger, Ghotit, etc.
- Word has superior drawing and graphic tools compared to Adobe Reader.

Disadvantages of the current DABs are:

- They do not display correctly when opened in Google Docs on Chromebooks (or other devices) or in Microsoft Word online or when viewed in Immersive Reader.
- Disabling access to supports such as spellcheck and thesaurus is more complex compared to PDF DABs.
- The candidate needs two applications: one to read the DQP and Word to type answers.
- Candidates who use a computer reader may have to use two programs: one for the PDF and another for Word.

Possible improvements for DABs in Word format:

- Re-design the front page to be compatible with all word processors in common use by students.
- Test and evaluate with students using the full range of devices and tools in use in schools.

Digital assessment formats used in 2020-21

In 2020-21, teachers and lecturers had freedom to create and use assessments in a range of digital formats, and given the limitations in terms of accessibility, distribution and creation, we were interested to discuss with colleagues what had been used for assessments over the session.

Word processors

Many teachers create resources and assessments using Microsoft Word or Google Docs. Some colleagues reported using these word processor formats to create assessments. Word processors have some advantages:

- teachers and lecturers can create and edit Word / Doc files easily;
- resources are interactive and students can type, draw and annotate using a range of tools;
- they have equation editors and drawing tools;
- teachers and students are generally familiar with word processors;
- accessibility tools such as Immersive Reader or Google Voice Typing are available.

A disadvantage of Word or Docs is the risk that the student might delete or alter a question by mistake.

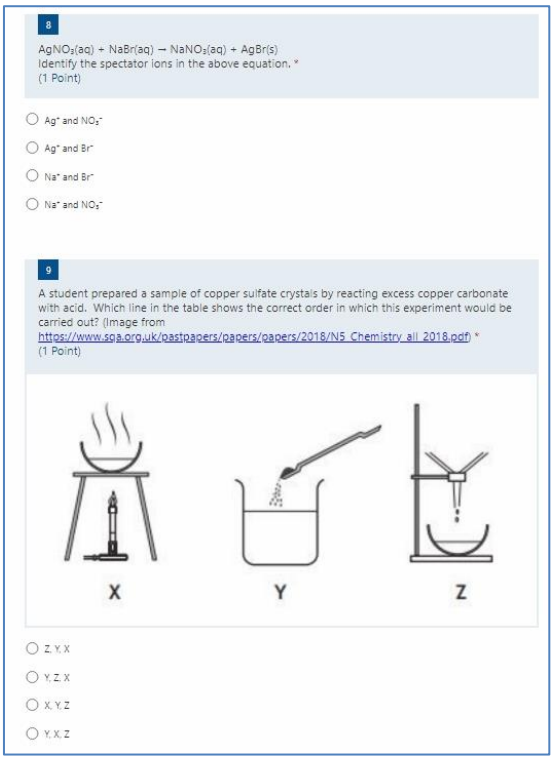
A second disadvantage is that the physical layout of the paper is altered when a student types an answer. This is an issue for SQA external examinations because altering the layout could cause problems for the automatic scanning and e-marking system, but it is not so relevant for internal assessments where the student's work is marked by the class teacher.

Microsoft Forms or Google Forms

Microsoft Forms and Google Forms are specifically designed for multiple choice and short-answer digital assessment and offer several advantages:

- They are cross-platform and work on Chromebook, iPads and Windows.
- Some security features are built in.
- The student cannot accidently delete the question.
- Delivery and collection of responses can be (semi) automatic.
- Immersive Reader works in Microsoft Forms.
- Students can write equations in Microsoft Forms.

Microsoft and Google Forms require an internet connection and so devices must be configured so that students can only access the assessment. One colleague advised that a Google Form only saves at the end of a session and that because of this, students lost work when connection to the internet had failed.



National 5 Chemistry - Acids and Bases, created by Colin McGill, converted by Gordon Smallwood, available at the National e-Learning Offer Resources.

Formats used in 2020-21

The impression given by colleagues during discussion is that subject teachers used word processor and digital quiz tools and formats for internal formative assessments during the autumn 2020 school term and during school closure from January to March 2021, and generally used PDF during the 2021 summer term for assessments to gather evidence for the ACM. The findings from the SSTA survey reporting that 99% of staff used the 2020 papers from SQA support this impression. However, since this observation is based on a small number of interactions with practitioners, we suggest that wider research is undertaken to investigate which technologies were used, and why.

Digital Accessibility

Digital assessments must be accessible in order that learners with disabilities or additional support needs can access them and to meet legal requirements under Scottish ASL legislation[71], the Equality Act 2010[72] and the Public Sector Bodies (Websites and Mobile Applications) Accessibility Regulations 2018[73].

Discussions with practitioners indicate that teachers do not necessarily appreciate these obligations or understand how to create digital assessments. One colleague reported learners being given a PDF created by scanning a paper assessment, which could not be accessed using a computer reader. Another teacher complained that SQA assessments on SOLAR could not be accessed using a computer reader.

---

[71] Scottish Government (2017) Additional support for learning: statutory guidance 2017
[72] Equality and Human Rights Commission (2015) Technical Guidance for Schools in Scotland.
[73] UK Government (2018) The Public Sector Bodies (Websites and Mobile Applications) Accessibility Regulations 2018

There is an urgent need for clear advice and professional learning on digital accessibility from SQA, Education Scotland, Scottish Government to ensure that reasonable adjustments are made for learners with disabilities or additional support needs.

General guidance is available on the CALL Scotland[74] and Digital Assessment[75] web sites and Craig Mill has created a series of 11 video guides on *Creating Accessible Documents and Formats*[76], together with a free online learning module on the topic[77]. We plan to develop more detailed content specifically for assessments.

Figure 2: Video guides about Creating Accessible Documents and Formats

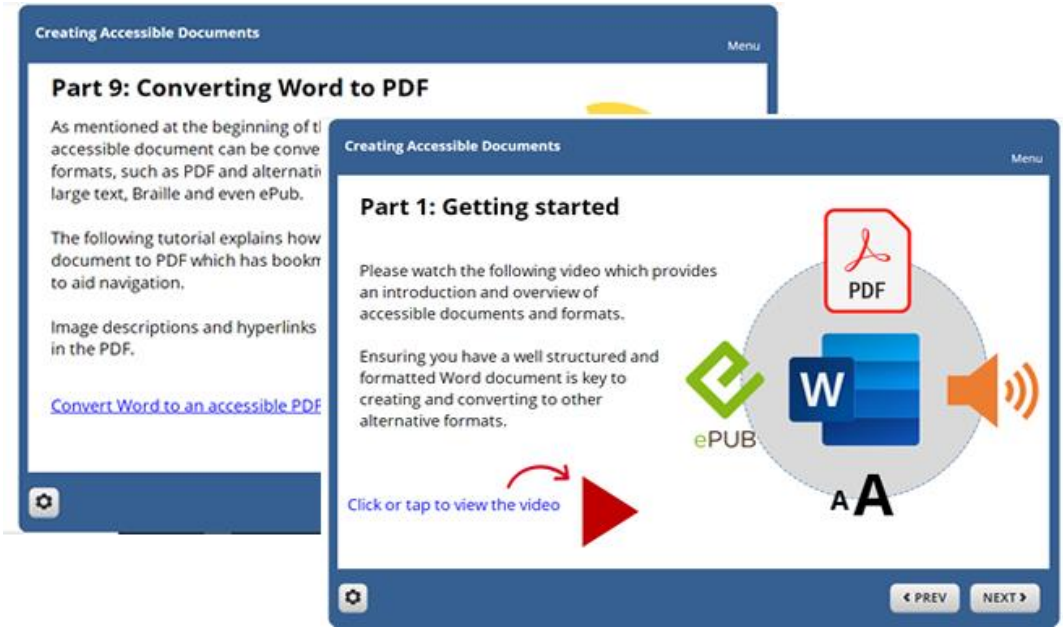


Figure 3: Creating Accessible Documents Online Learning Module

[74] Nisbet (2020) Learning at Home - are Your Learning Resources Accessible? 25/5/20.
[75] CALL Scotland (2021) Create An Assessment with Microsoft Word.
[76] Mill, C (2021) Creating Accessible Documents and Formats, CALL Scotland Blog 18/2/21
[77] Mill, C (2021) Creating Accessible Documents - a Free Online Learning Module, CALL Scotland Blog 25/8/21

Wider Scottish education environmental considerations

The Covid-19 pandemic and response have resulted in huge upheaval to education in Scotland and some of the impacts are unlikely to be reversed. These wider systemic factors will impact upon the use of technology for assessment arrangements in the future.

Digital learning and e-Assessment

Several local authorities in Scotland have accelerated or announced plans to provide digital devices for all students and the SNP made a manifesto commitment to ensure that all students have a personal device[22].

Soon all students in Scotland will have access to a personal digital device in school and this raises questions regarding the design and format of assessment in the senior please: essentially, should assessments be created for digital access rather than or in addition to paper? In a class where all students have a personal digital device and where use of technology for formative assessment and coursework is the norm (although we should be wary of making the assumption that access to devices leads automatically to their widespread usage), it is increasingly anachronistic to expect students to sit end of year summative assessments using pen and paper.

In the short term there are two drivers that will emerge from increased access and use of personal digital technology:

- Learners with disabilities or additional support needs are more likely to request technology-based assessment arrangements.
- The wider candidate population are more likely to request to use their devices to type up answers in examinations. This scenario will have a significant impact upon administration of examinations in schools.

OECD and Senior Phase assessment

The recent report from OECD[41] notes that "*Despite attempts to reform qualifications, misalignment between CfE's aspirations and the qualification system became a barrier to CfE's implementation in secondary education*" and "*From the issues raised throughout the OECD visit and the literature, it seems that the education system spends a disproportionate amount of time and energy on technical issues around student assessments and (high stakes) examinations, while there are doubts about the relevance and validity of their goals and content*" and suggests considering new options for student assessment:

- "*more portfolio assessment approaches, with rubrics that consider the entire curriculum spirit (in particular, the four capacities)*
- *more emphasis on flexible, formative and continuous assessment components than is currently the case (current emphasis is strong on all-in-one final, summative exam events even if other components exist)*
- *more use of digital opportunities for feedback and feedforward*
- *maintaining (even strengthening) a strong role for teacher judgements with appropriate, manageable and cost-effective means of moderation*."

It is possible then that the current system of high-stakes examinations at the end of each year of the senior phase will be reformed.

SQA

Following the OECD review, Scottish Government intends to "*replace the Scottish Qualifications Authority (SQA) with a new specialist agency for both curriculum and assessment*" while "*The Education Secretary intends to outline plans for awarding national qualifications in 2022 by the start of the new school term this August, taking into account the most up-to-date position with the pandemic*." [78] Clearly this is likely to impact upon assessment at senior phase not only in 2022 but beyond.

International Council of Education Advisors and Universal Design

Digital devices are of little benefit without teaching and learning that embraces technology and the Covid-19 pandemic has resulted in significant developments in digital learning. Teachers and lecturers rapidly developed expertise in use of online tools such as Microsoft Teams and OneDrive or Google Meet and Classroom[79] while the National e-Learning Offer[80] provides live and online recorded lessons and other teaching resources.

Digital teaching and learning is becoming the 'normal way of working' in many schools and centres and therefore learners and practitioners are using or wishing to use technology in assessment contexts.

However, our experience working with learners with additional support needs over the past year (and previously) indicates that digital learning resources are not always accessible for learners with additional support needs (e.g. students are provided with documents that cannot be accessed using text-to-speech; inaccessible PDFs; videos without captions) and there is a need for professional learning and for the development of workflows and practices to ensure that digital learning resources are accessible and easy to use.

To address the issue of inaccessible learning resources and assessments we advocate adoption of Universal Design for Learning[81].

Universal Design has been endorsed and recommended by the Scottish Government's International Council of Education Advisors[82]:

"*Our report proposes a profound transformation to Scottish education, indeed to all educational systems, so that they can operate in a pandemic as effectively, or almost as effectively as in other circumstances. It also proposes a universally designed educational system that provides high quality education for all during a pandemic in ways that also improve and transform high quality education for all in other "normal" circumstances.*

Universal design is a widely used principle in inclusive education. Originating in architecture, the idea of universal design is that buildings should not be constructed for normal users and then adapted for special populations like the visually impaired or the disabled. Rather, from the outset, a building should be designed so that it can be used and enjoyed by the maximum number and range of users. The coronavirus pandemic has exposed the fact that our educational systems are

---

[78] Scottish Government (2021) Education reform. Accessed 6/8/21.
[79] Education Scotland (2021) National overview of practice: reports. Accessed 9/7/21.
[80] Education Scotland (2021) National e-Learning Offer. Accessed 9/7/21.
[81] CAST (2021) About Universal Design for Learning. Accessed 9/7/21.
[82] Scottish Government (2020) International Council of Education Advisers Report 2018-2020. Accessed 9/7/21.

not universally designed. Whether they are centralised or decentralised, any disturbance of what is considered to be normal requires crisis-driven responses that are typically insufficient and that incur temporary and sometimes lasting harm as a result."

UDL covers the curriculum in its entirety and can also be applied to learning and assessment approaches and resources. We commend UDL for consideration in future planning around Digital Question Papers and assessments for the senior phase. UDL helps to design materials that are universally accessible: rather than manually re-designing a question paper into an alternative format, UDL encourages the creation of resources that are universally accessible or can be easily adapted into materials that are accessible. Assessments created to be universally accessible would be designed to be accessed both digitally and on paper; would enable alternative formats to be produced quickly and easily; and would be more accessible on the full range of digital devices in use in Scottish schools.

Collated Footnotes

1. Albright, K. (2004) Environmental Scanning: Radar for Success. The Information Management Journal, May/June 2004.
2. Scottish Government (2020) Update on school closures and exams 19/3/20. Accessed 9/7/21.
3. Scottish Government (2020) SQA Awards 2021. 7/10/20. Accessed 9/7/21.
4. Scottish Government (2020) Coronavirus (COVID-19) - education sector: Deputy First Minister statement 8 December 2020. Accessed 9/7/21.
5. Education Scotland (2021) National overview of practice in remote learning: local authorities.
6. Education Scotland (2021 National overview of practice in remote learning: schools.
7. Education Scotland (2021) National overview of practice in remote learning: parents, carers and learners.
8. Fiona Couper-Kenney & Sheila Riddell (2021) The impact of COVID-19 on children with additional support needs and disabilities in Scotland, European Journal of Special Needs Education, 36:1, 20-34, DOI: 10.1080/08856257.2021.1872844 Accessed 13/7/21.
9. Children and Young People's Commissioner Scotland (2020) Independent Children's Rights Impact Assessment. Accessed 13/7/21.
10. Children and Young People's Commissioner Scotland (2020) The pandemic's impact on: Children and young people with disabilities and ASNs. Accessed 13/7/21.
11. SQA (2020) Alternative certification model - National Qualifications 2021 Accessed 9/7/21.
12. SQA (2021) Gathering evidence for provisional results Accessed 9/7/21.
13. SQA (2020) SQA statement on arrangements for the assessment of National 5, Higher and Advanced Higher courses in the 2020-21 session. 7/10/20. Accessed 9/7/21.
14. SQA (2021) Assessment resources. Accessed 12/7/21.
15. Education Scotland (2021) National overview of practice in remote learning: a focus on meeting learning needs, including those with additional support needs.
16. Glasgow City Council (2018) Digital Glasgow Strategy. Available at: https://www.glasgow.gov.uk/councillorsandcommittees/viewSelectedDocument.asp?c=P62AFQDN2UUTDNUT81. Accessed 18/10/21.
17. Scottish Borders Council (2019) Inspire Learning FAQs. Available at: https://www.scotborders.gov.uk/info/20009/schools_and_learning/914/inspire_learning_faqs. Accessed 18/10/21.
18. City of Edinburgh Council (2021) Digital boost for pupils with 39,000 iPads in 1:1 roll out. 1/4/21. Accessed 18/10/21.
19. Seith, E. (2020) Over 40% of councils opt out of national laptop scheme, TES 18/8/20.
20. Scottish Government (2020) Helping families get online, 24/11/20
21. Scottish Government (2021) Funding provided for laptops for school children: FOI release. Accessed 14/7/21.
22. SNP (2021) A laptop or tablet for every school child. 28/3/21. Accessed 9/7/21.
23. Scottish Government (2021) Devices for 700,000 children. 16/8/21. Accessed 18/10/21.
24. SQA (2019) Assessment Arrangements Explained: Information for centres. Accessed 9/7/21.
25. Edyburn, D.L. (2020) Rapid literature review on assistive technology in education: Research report. Accessed 9/7/21.
26. Microsoft (2021) Digital Learning Tools from Microsoft Education. Accessed 21/7/21.
27. Education Scotland (2021) National overview of practice in remote learning 4: Schools: a focus on meeting learning needs, including those with additional needs.

28. Nisbet, P. (2020) Technology-based Assessment Arrangements - Speech to Text Alternatives to Scribes.
29. CALL Scotland Dragon NaturallySpeaking 13 in SQA Examinations
30. SQA Speech Recognition Software in SQA Examinations and Assessments.
31. SQA (2020) About assessment arrangements. Accessed 9/7/21.
32. SQA (2021) Assessment arrangements in 2020-21. Accessed 9/7/21.
33. Nisbet, P. (2020) SQA Publish Information on Assessment Arrangements for the 2019 Diet. 2/3/20.
34. Nisbet, P. (2018) SQA Digital Question Papers Focus Group 2018. 5/12/18.
35. SQA (2020) National Courses: guidance on gathering evidence and producing estimates. October 2020, Publication Code BBB8283. Accessed 9/7/21.
36. Education Scotland (2021) National Review of local authority approaches to quality assurance as part of the alternative certification model. Accessed 9/8/21.
37. TES (2021) SQA results 2021: Don't scrap exams in push for change. TES 8/8/21.
38. SQA (2021) Appeals 2021 - Information for learners. Accessed 9/8/21.
39. SSTA (2021) SSTA Survey – Alternative Certification Model (ACM) – May 2021.
40. SQA (2021). Appeals 2021 - Information for learners. Accessed 9/7/21.
41. OECD (2021), Scotland's Curriculum for Excellence: Into the Future, Implementing Education Policies, OECD Publishing, Paris, https://doi.org/10.1787/bf624417-en.
42. Nisbet, P. (2021) How to Divide and Edit SQA Question Papers.
43. Nisbet, P. (2021) Technology-based Assessment Arrangements - Digital Assessments Must be Accessible.
44. Nisbet, P. (2021) Technology-based Assessment Arrangements - Which Digital Formats?
45. CALL Scotland (2021) Scottish digital voices. Accessed 14/7/21.
46. Nisbet, P. (2021) Accessible Word Templates for 2021 National Qualifications.
47. Nisbet, P. (2021) Create An Assessment with Microsoft Word.
48. Say, M (2021) Edinburgh Council to give iPads to schoolchildren. Accessed 14/7/21.
49. Nisbet, P. (2021) Technology-based Assessment Arrangements - SQA Digital Exams on iPad.
50. CALL Scotland (2020) Reading Digital Papers
51. Glasgow City Council Remote Deployment: Early Years and Teacher iPads. Accessed 14/7/21.
52. Information Commissioner's Office. Data Protection Impact Assessment. Accessed 14/7/21.
53. SQA (2021) About SOLAR
54. SQA (2021) Making ASPs available in SOLAR.
55. CALL Scotland (2021) Communication aids. Accessed 15/7/21.
56. Nisbet et al (2020) Chromebooks and SQA Assessment Arrangements
57. Google (2021) Install Android apps on your Chromebook. Accessed 15/7/21.
58. Highland Council (2021) How to install and run Microsoft Office on a Chromebook. Accessed 15/7/21.
59. Google (2021) Deploy Android apps to managed users on Chromebooks. Accessed 15/7/21.
60. Glow. Apps and Extensions. Accessed 15/7/21.
61. CALL Scotland (2021) Text Readers. Accessed 15/7/21.
62. SQA (2021) About SOLAR
63. SQA (2019) Digital Question Papers: Technical Guidance pp. 5, 7, 8
64. SQA (2020) Using technology to support assessment remotely: questions and answers.
65. Nisbet et al (2020) Chromebooks and SQA Assessment Arrangements. Accessed 14/7/21.
66. Ofqual (2021) The use of assistive technologies for assessment. Accessed 20/6/21.
67. Nisbet, P. D. (2020). Assistive technologies to access print resources for students with

visual impairment: Implications for accommodations in high stakes assessments. British Journal of Visual Impairment, 38(2), 222–247. https://doi.org/10.1177/0264619619899678 Open access accepted author manuscript: https://www.research.ed.ac.uk/portal/files/135008703/ACCEPT_1.PDF
68. Nisbet, P. (2021) How to Read Maths with Immersive Reader.
69. Frankel, L., Brownstein, B. and Soiffer, N. (2017), Expanding Audio Access to Mathematics Expressions by Students With Visual Impairments via MathML. ETS Research Report Series, 2017: 1-53. https://doi.org/10.1002/ets2.12132
70. UKAAF (2014) UKAAF minimum standards: Accessible PDFs For Assessment.
71. Scottish Government (2017) Additional support for learning: statutory guidance 2017
72. Equality and Human Rights Commission (2015) Technical Guidance for Schools in Scotland.
73. UK Government (2018) The Public Sector Bodies (Websites and Mobile Applications) Accessibility Regulations 2018
74. Nisbet (2020) Learning at Home - are Your Learning Resources Accessible? 25/5/20.
75. CALL Scotland (2021) Create An Assessment with Microsoft Word.
76. Mill, C (2021) Creating Accessible Documents and Formats, CALL Scotland Blog 18/2/21
77. Mill, C (2021) Creating Accessible Documents - a Free Online Learning Module, CALL Scotland Blog 25/8/21
78. Scottish Government (2021) Education reform. Accessed 6/8/21.
79. Education Scotland (2021) National overview of practice: reports. Accessed 9/7/21.
80. Education Scotland (2021) National e-Learning Offer. Accessed 9/7/21.
81. CAST (2021) About Universal Design for Learning. Accessed 9/7/21.
82. Scottish Government (2020) International Council of Education Advisers Report 2018-2020. Accessed 9/7/21.