Reliant on Readers, Stuck with Scribes or Independent with ICT?

Technology in examinations

BDA International Conference 11 March 2016
CALL Scotland

- Communication, Access, Literacy and Learning
- Funded primarily by Scottish Government
- National Assistive and Communication Technology
- Service, research and development

www.CALLScotland.org.uk
Scottish School Assessments

- Formal examinations sat by most students in Scotland.
- Traditional paper format.
- 657,055 examinations sat by 130,682 candidates in 2015.
- Administered by the Scottish Qualifications Authority (SQA).
## Scottish / UK qualifications

<table>
<thead>
<tr>
<th>SCQF level</th>
<th>Examination</th>
<th>QCF level</th>
<th>Examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>8/7</td>
<td>Advanced Higher</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Higher</td>
<td>3</td>
<td>A level, AS level</td>
</tr>
<tr>
<td>5</td>
<td>National 5</td>
<td>2</td>
<td>GCSE (A* - C)</td>
</tr>
<tr>
<td>4</td>
<td>National 4 (internal assessment)</td>
<td>1</td>
<td>GCSE (D-G)</td>
</tr>
</tbody>
</table>

[www.sqa.org.uk/sqa/64561.4196.html](http://www.sqa.org.uk/sqa/64561.4196.html)
Assessment / Access Arrangements

“Assessment arrangements allow candidates who are disabled and/or who have been identified as having additional support needs appropriate arrangements to access the assessment without compromising its integrity.”

*Assessment Arrangements Explained*, p. 1
SQA January 2010, revised July 2014

“The intention behind an access arrangement is to meet the particular needs of an individual candidate without affecting the integrity of the assessment. Access arrangements are the principal way in which awarding bodies comply with the duty under the Equality Act 2010 to make ‘reasonable adjustments’.

*Adjustments for candidates with disabilities and learning difficulties*
JCQ, 2015-16
## Assessment / Access Arrangements
### 2014-15

<table>
<thead>
<tr>
<th></th>
<th>SQA</th>
<th>GCSE &amp; GCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Candidates requesting AA</td>
<td>14,489</td>
<td>173,850</td>
</tr>
<tr>
<td>% of total candidates</td>
<td>11.1 %</td>
<td>9 %</td>
</tr>
<tr>
<td>Number of requests for AA</td>
<td>43,997</td>
<td>(255,850 approved)</td>
</tr>
<tr>
<td>% of total examination entries</td>
<td>6.67 %</td>
<td>1.2% ???</td>
</tr>
</tbody>
</table>

### Sources:
- SQA: data from SQA to author
## SQA Assessment Arrangements 2005

<table>
<thead>
<tr>
<th>Assessment Arrangement</th>
<th>Number of requests which included the specific arrangement</th>
<th>Percentage of requests which included the specific arrangement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of requests</td>
<td>41,454</td>
<td></td>
</tr>
<tr>
<td>Extra Time</td>
<td>33,146</td>
<td>79.96%</td>
</tr>
<tr>
<td><strong>Reader</strong></td>
<td>15,740</td>
<td>37.97%</td>
</tr>
<tr>
<td><strong>Scribe</strong></td>
<td>14,505</td>
<td>34.99%</td>
</tr>
<tr>
<td>PA Referral</td>
<td>3,658</td>
<td>8.82%</td>
</tr>
<tr>
<td><strong>Use of ICT</strong></td>
<td>2,388</td>
<td>5.76%</td>
</tr>
<tr>
<td>Transcription with correction</td>
<td>1,178</td>
<td>2.84%</td>
</tr>
<tr>
<td>Coloured Paper</td>
<td>1,108</td>
<td>2.67%</td>
</tr>
<tr>
<td>Calculator</td>
<td>893</td>
<td>2.15%</td>
</tr>
<tr>
<td>Transcription without correction</td>
<td>742</td>
<td>1.79%</td>
</tr>
<tr>
<td>Enlarged Print</td>
<td>737</td>
<td>1.78%</td>
</tr>
<tr>
<td>Question Paper signed to candidate</td>
<td>92</td>
<td>0.22%</td>
</tr>
<tr>
<td>Candidate Signs Responses</td>
<td>38</td>
<td>0.09%</td>
</tr>
<tr>
<td>Use of tape recorder for responses</td>
<td>26</td>
<td>0.06%</td>
</tr>
<tr>
<td>Braille</td>
<td>19</td>
<td>0.05%</td>
</tr>
</tbody>
</table>
SQA Digital Question Papers

Read questions with text-to-speech

Change background and foreground colours

Click to tick

Type your answers

5. Subair is working on some graphics to advertise some of the sporting events in the Commonwealth Games.

(a) (i) The graphics were drawn using a variety of shapes. Which type of package is he using?

Tick **one** box

- word processing
- operating system
- vector graphics package
- bit mapped graphics package

(ii) Subair uses a mouse when creating graphics. State an alternative input device that Subair could use.

Subair could use a graphics tablet.
SQA Digital Question Papers

6. (a) Complete the table below for $y = 4x - 5$.

<table>
<thead>
<tr>
<th>$x$</th>
<th>-1</th>
<th>0</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>$y$</td>
<td>-9</td>
<td>-5</td>
<td>7</td>
</tr>
</tbody>
</table>

(b) Draw the line $y = 4x - 5$ on the grid.

Click Comment, then use the Annotations or Drawing Markups to type comments, highlight or underline text or draw on the paper.
Reading / accessing the paper

- Zoom in and out
- Papers (without answer boxes) can be re-flowed
- Set page and text colours
- Navigate with keyboard/mouse
- Read with text-to-speech
Writing and answering

- Type into answer boxes
- Draw and annotate
- Spellchecker
- Word prediction
- On-screen keyboards
- Switch access
- Speech recognition
Limitations

Digital version of assessments designed for paper: some subjects and questions are difficult to read with TTS or answer on a computer (e.g. maths)...

1. Evaluate

\[2\frac{3}{8} \div \frac{5}{16} = \frac{19}{8} \div \frac{5}{16} = \frac{38}{16} \div \frac{5}{16} = \frac{38}{5} = 7\frac{3}{5}\]

5
\[
\begin{array}{c}
\frac{4}{\sqrt{6}} \\
= \frac{4 \times \sqrt{6}}{\sqrt{6} \times \sqrt{6}} \\
= \frac{4 \times \sqrt{6}}{6} \\
= 2\sqrt{6} \\
\end{array}
\]

7a
\[
\begin{array}{c}
\frac{1}{2} \left( \frac{\frac{3}{2}}{x} + \frac{\frac{1}{2}}{x} \right) \\
= \frac{1}{2} \left( \frac{\frac{3}{2}}{x^2} + \frac{\frac{1}{2}}{x} \right) \\
= \frac{\frac{3}{2}}{x} + \frac{\frac{1}{2}}{x} \\
= \frac{\frac{3}{2}}{x} + \frac{1}{2} \\
= \frac{\frac{3}{2}}{x} + \frac{1}{2} \\
\end{array}
\]

8
\[
\begin{array}{c}
p = \left( \frac{mv^2}{2} \right) \\
2p = mv^2 \\
v^2 = \frac{2p}{m} \\
v = \sqrt{\frac{2p}{m}} \\
\end{array}
\]
## 2015 SQA Assessment Arrangements

<table>
<thead>
<tr>
<th>Service</th>
<th>Requests</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extra Time</td>
<td>35,042</td>
<td>Transcription with correction</td>
</tr>
<tr>
<td>Separate Accommodation</td>
<td>24,486</td>
<td>Transcription without correction</td>
</tr>
<tr>
<td>Use of ICT (including Digital Question Papers)</td>
<td>11,437</td>
<td>Calculator</td>
</tr>
<tr>
<td>Reader</td>
<td>7,819</td>
<td>Modified Content (e.g. text description of images)</td>
</tr>
<tr>
<td>Scribe</td>
<td>5,600</td>
<td>Referral of script to the Principal Assessor</td>
</tr>
<tr>
<td>Digital Question Papers only</td>
<td>3,652</td>
<td>Adapted Certificate (e.g. in Large Print / Braille)</td>
</tr>
<tr>
<td>Rest Period</td>
<td>2,723</td>
<td>Question Paper signed to candidate</td>
</tr>
<tr>
<td>Coloured Paper</td>
<td>1,878</td>
<td>Taped transcription-Live Presentation</td>
</tr>
<tr>
<td>Prompter / Practical Helper</td>
<td>1,660</td>
<td>Braille</td>
</tr>
<tr>
<td>Enlarged or Adapted Print Question Papers</td>
<td>1,081</td>
<td>Candidate Signs Responses</td>
</tr>
</tbody>
</table>
Digital Question Papers 2008-2015

Number of DQP requests and candidates

Number of requests

Number of candidates

Number of requests for readers, scribes and ICT / DQP

Number of Requests

- Reader
- Scribe
- ICT or Digital Paper

Proportion of AA requests that include reader, scribe and ICT

- Reader
- Scribe
- ICT or Digital Paper


Percentage: 0%, 5%, 10%, 15%, 20%, 25%, 30%, 35%, 40%, 45%
# 2015 GCSE / GCE Access Arrangements

<table>
<thead>
<tr>
<th>Service</th>
<th>Quantity</th>
<th>Description</th>
<th>Extra Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>25% extra time</td>
<td>138,550</td>
<td>Alternative Accommodation</td>
<td>2,550</td>
</tr>
<tr>
<td>Reader</td>
<td>58,950</td>
<td>Modified language</td>
<td>2,350</td>
</tr>
<tr>
<td>Scribe</td>
<td>29,900</td>
<td>Oral Language Modifier</td>
<td>1,200</td>
</tr>
<tr>
<td>18-point bold papers</td>
<td>12,800</td>
<td>Braille papers and tactile diagrams with Braille labels</td>
<td>1,100</td>
</tr>
<tr>
<td>Non-interactive electronic QPs</td>
<td>10,150</td>
<td>Other formats</td>
<td>1,000</td>
</tr>
<tr>
<td>Exam on Coloured Paper</td>
<td>8,250</td>
<td>Practical Assistant for written paper</td>
<td>750</td>
</tr>
<tr>
<td>24-point bold papers</td>
<td>8,050</td>
<td>Tactile diagram with print labels</td>
<td>650</td>
</tr>
<tr>
<td>Bilingual Dictionary with extra time of up to 25%</td>
<td>6,150</td>
<td>Practical Assistant for practical paper</td>
<td>600</td>
</tr>
<tr>
<td>Extra Time &gt; 25%</td>
<td>4,250</td>
<td>Other</td>
<td>450</td>
</tr>
<tr>
<td>Computer reader</td>
<td>4,200</td>
<td>Transcript of listening test/video</td>
<td>50</td>
</tr>
</tbody>
</table>
Factors supporting uptake

1. Access to Digital Exam Papers
   • ... that can be read accurately with text to speech
   • ... with answer boxes

2. Easy to administer

3. Lower costs, fewer rooms than reader / scribes

4. Sustained support for schools and centres

5. Demonstrated independence for learners
Another contributing factor to the increase in modified paper requests is that non-interactive electronic question papers (QPs) were included for the first time in summer 2014. These have increased by 111 per cent in 2015 (from 4,800 to 10,150).

Access Arrangements for GCSE and A Level: 2014/15 Academic Year, p. 7
Past / practice papers

- **SQA**
- **AQA**
- **Pearson**
- **OCR**
- **WJEC** (Digital Papers not provided as access arrangements)
What’s needed for text-to-speech?

- Most students can use basic TTS tools to read a standard PDF exam.
- BUT - the text must selectable so it can be read!
- Candidates with significant visual impairment require the reading order in the paper to be corrected.
- Voice quality is important.
- Pronunciation accuracy is important.
- Reading maths is still poor.
Computer Readers (Windows)

- **Read Out Loud** (free in Adobe Reader) – hard to control what it reads.
- **Natural Reader** (free, paid version available)
- **Orato** (free)
- **ClaroRead** (from £495, school site licence)
- **Penfriend XL** (£600 secondary school licence)
- **Read & Write** (£1995 secondary school site licence)

See [Digital Assessment Text to Speech](CALL's Text to Speech pages)

BDA Computer readers for use with PDF exam papers
Text-to-speech voice quality

“many of the students commented that the synthetic voice was of poor quality and was difficult to understand”

“The most common suggestion for improvement to the PDF examinations was to improve the quality of the synthetic voice.”


http://www.adapteddigitalexams.org.uk/Downloads/Reports/
2008: ‘Heather’ licenced for Scottish schools

2011: ‘Stuart’ developed and licenced

2015: ‘Ceitidh’ Gaelic voice developed and licenced

> £2 million cost saving compared to schools buying high quality TTS.

Schools get the voices from:

http://www.thescottishvoice.org.uk

..so we licensed high quality Scottish voices from CereProc in Edinburgh

www.CereProc.co.uk
The original 2013 N4 English with Literacy Package 2 and 3 had ‘image text’ that 
could not be read with TTS.

...after [too much] lobbying, the 2014 versions were altered and can be read using TTS.
Uncorrected reading order makes standard Level 1 papers inaccessible for blind candidates.
UKAAF Standards

- [UKAAF minimum standards: Accessible PDFs For Assessment](#) (2015)
- [Accessible PDF for assessments: Guidelines](#) (2015)

- **Level one** is a PDF version of the standard assessment intended for use by sighted candidates who are print impaired.
- **Level two** is intended for use by candidates who are blind or who have a significant visual impairment. The file should be suitable for candidates who cannot see the text and who rely on computerised speech to read the questions.
(b) An example of a compressed *graphic file type* is gif.

What is meant by file compression?

File compression means that the file is |

(c) Which of the following devices would be needed to output music?

Tick one box.

- Graphics Card
- Video Card
- Modem
- Sound Card

- [ ] Graphics Card
- [ ] Video Card
- [ ] Modem
- [X] Sound Card
Non Interactive PDFs

Digital Question Paper

SECTION 1 — SCOTTISH CONTEXTS — 20 marks

Part A — The Wars of Independence, 1286–1328

 Attempt the following questions using recalled knowledge and information from the sources where appropriate.

1. Explain the reasons why Edward I was able to become involved in Scottish affairs between 1286 and 1292.

2. Describe what happened at the Battle of Stirling Bridge in 1297.

Digital Answer Booklet (PDF or Word)

Edward I was able to become involved in Scottish affairs because Alexander III fell from his horse at Kinghorn in Fife and died. His only heir was his grand-daughter Margaret, who was age 3 and was the daughter of the King of Norway. It was agreed that Margaret would marry Edward II of England, but she died on the journey from Norway. Scotland therefore did not have a king, and King Edward I of England was invited to assist in choosing the next King of Scots.
What the customers want ...

Answer Boxes on all Digital Question papers:

• “It would be more useful for pupils who are very dyslexic and who have organisational problems to have form fields on the digital paper so that they do not have to switch from the question paper to the answer booklet.”

• “make them genuinely digital i.e. allow candidates to answer on the digital paper (like Design and Manu) rather than having to switch between question paper and answer sheets as they do in History and geography.”
Cost

All schools and students have access at zero cost to:
• Adobe Reader
• Text reader software
• High quality voices
• Past papers from SQA’s website

“Simplify, then add lightness”
Colin Chapman, Lotus
GCSE / GCE Digital Papers

Graph showing trends in modified QPs from 2011 to 2015.
## GCSE / GCE Approved Requests

<table>
<thead>
<tr>
<th></th>
<th>2012/13</th>
<th>2013/14</th>
<th>2014/15</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reader</strong></td>
<td>55,150</td>
<td>59,650</td>
<td>58,950</td>
</tr>
<tr>
<td><strong>Scribe</strong></td>
<td>30,900</td>
<td>31,350</td>
<td>29,900</td>
</tr>
<tr>
<td><strong>Enlarged Print</strong></td>
<td>14,150</td>
<td>19,650</td>
<td>20,850</td>
</tr>
<tr>
<td><strong>Non-interactive</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>electronic QPs</strong></td>
<td>0</td>
<td>4,800</td>
<td>10,150</td>
</tr>
<tr>
<td><strong>Exam on Coloured</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Paper</strong></td>
<td>4,800</td>
<td>6,300</td>
<td>8,250</td>
</tr>
<tr>
<td><strong>Computer Reader</strong></td>
<td>800</td>
<td>2,400</td>
<td>4,200</td>
</tr>
</tbody>
</table>
GCSE / GCE Approved Requests

- Reader
- Scribe
- Enlarged Print
- Non-interactive electronic QPs
- Exam on Coloured Paper
- Computer Reader
SQA Requests

SQA AA Requests

- Reader
- Scribe
- Use of ICT not including digital papers
- Digital Question Papers
- Coloured Paper
- Enlarged or Adapted Print Question Papers
Accommodation and costs

- 7,819 reader requests; 5,600 scribe requests
- ~ 16,000 individual exams
- ~ 23,000 hours
- Say average £20/hour for reader/scribe?
  = £460,000
- Say £10/hour for invigilator?
  = £230,000

TOTAL = £690,000 in 2015

What’s the cost of the 58,950 readers that were used in GCSE/GCE assessments in 2014/15?
Independence

• “The pupils' experience of using the digital exams was a very positive one. Pupils adapted to the technology with ease and each found their own preferred way of using it - some pupils used the digital reader only for text that they struggled with in the paper copy whereas others did not look at the paper exam and worked exclusively on the computer. It was this flexibility of use that impressed me.”

• “I think the digital exam system is an excellent option for pupils with ASN and gives them more independence.”

• Increases candidates’ feelings of independence and control over their speed of progress. Helps with confidence to face next step, e.g. college, work.
Reliant on Readers
Stuck with Scribes
or
Independent with ICT?

How can YOU help your learners
to be more independent?