1 October 2014 : 07:00AM GMT

Assessment for all: From rhetoric to realities

Alistar McNaught, JISC TechDis, UK
Paul Nisbet - CALL Scotland, UK
Abi James, British Dyslexia Association & Assistive Learning, UK

Your hosts

Professor Geoff Crisp,
Dean Learning and Teaching, RMIT University

geoffrey.crisp[at]rmit.edu.au

Dr Mathew Hillier,
Institute for Teaching and Learning Innovation,
University of Queensland

mathew.hillier[at]uq.edu.au

Assessment for all

From rhetoric to realities

Alistar McNaught

Paul Nisbet

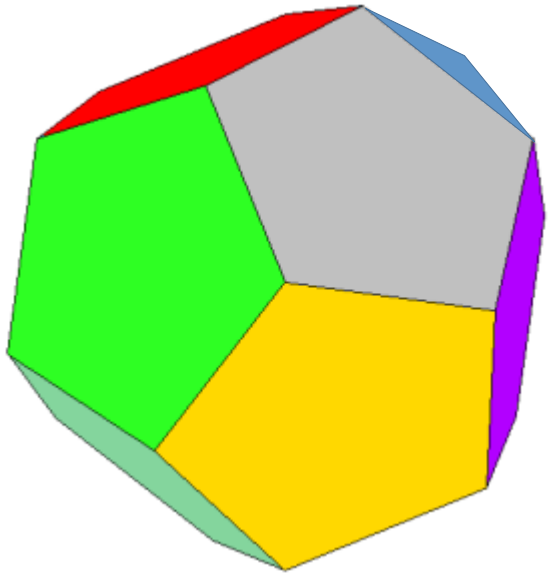
Abi James

Session structure

- Key facets of accessible assessment
  - Alistair McNaught, Jisc TechDis
- Awarding bodies and the UK experience
  - Paul Nisbet, CALL Scotland
- Caveats and counting
  - Abi James, British Dyslexia Asociation

Facets of accessible assessment

Clarity of Language

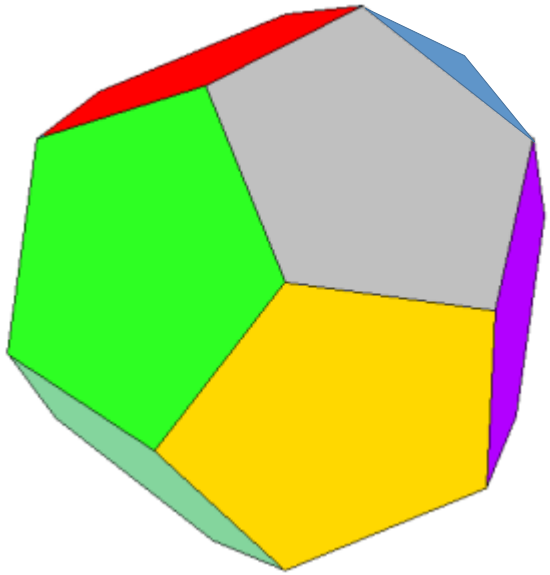


See Fair Access by Design - section 26 Readability

Facets of accessible assessment

Clarity of Language

Media? Text? Image? Video? Audio?



Facets of accessible assessment

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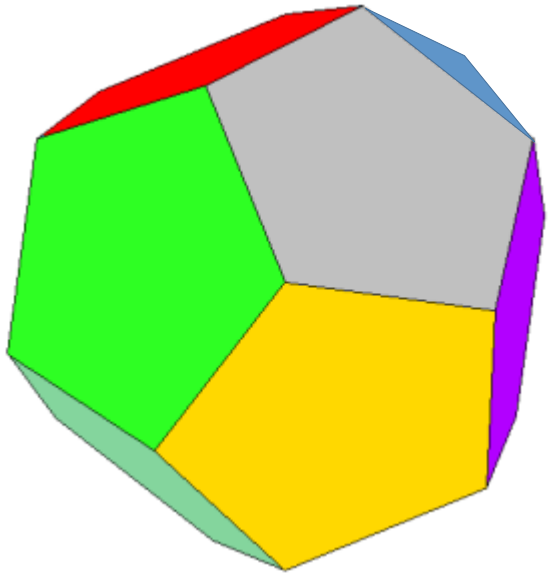
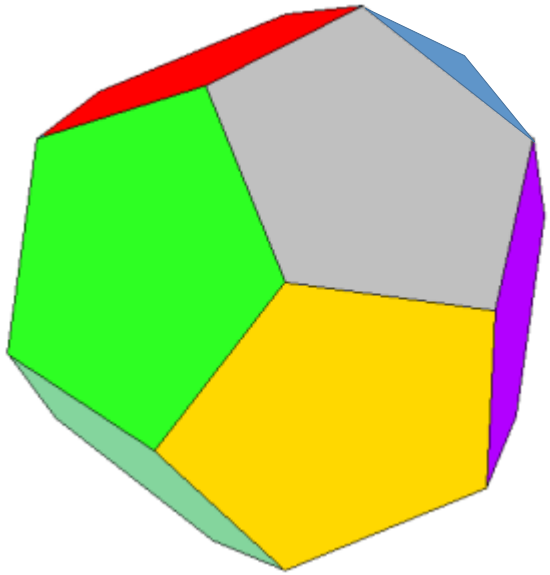


Media? Text? Image? Video? Audio?

Task? Write? Speak? Draw? Calculate? Choose? Drag and drop?

Facets of accessible assessment

Clarity of Language



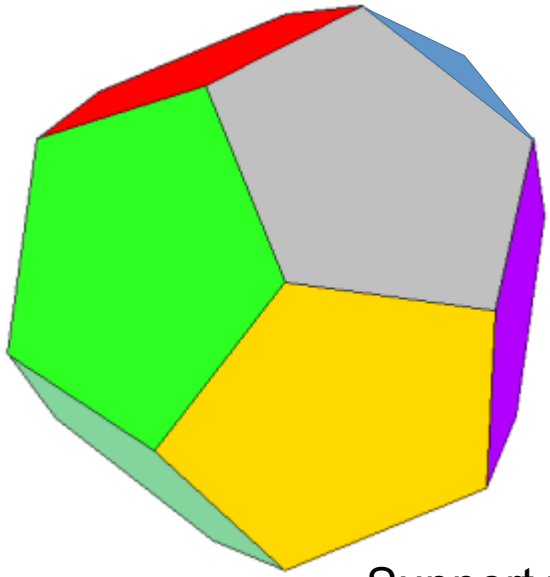
Media? Text? Image? Video? Audio?

Task? Write? Speak? Draw? Calculate? Choose? Drag and drop?

Format? PDF (image); PDF (text); PDF (interactive); Flash; HTML; Javascript; EPUB

Facets of accessible assessment

Clarity of Language



Media? Text? Image? Video? Audio?

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Support for learner? Face to face? Online? Interpretive? Technical?

Facets of accessible assessment

Clarity of Language

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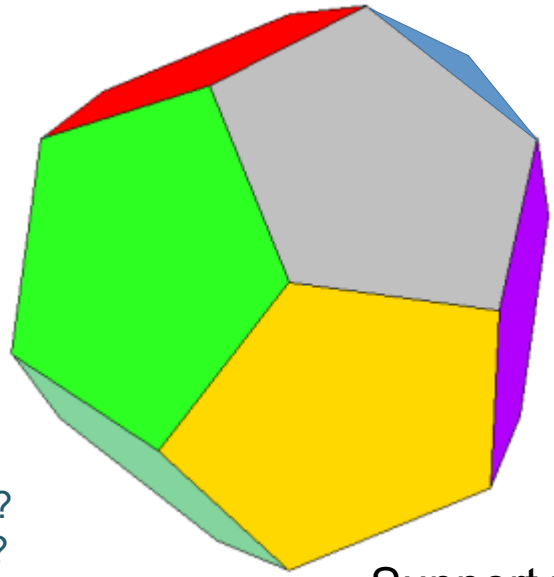

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Format? PDF (image); PDF (text); PDF (interactive); Flash; HTML; Javascript; EPUB

Nature of test? Formative? Summative? Career defining? Scale? (faculty, organisation, state, nation?); Longevity?

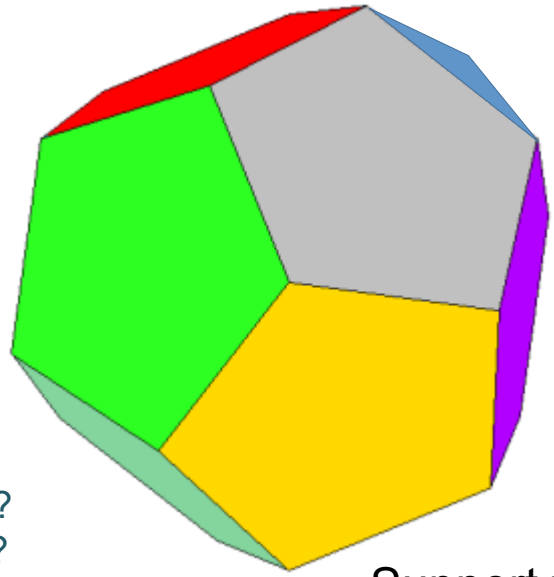
Support for learner? Face to face? Online? Interpretive? Technical?

Facets of accessible assessment

Clarity of Language

Media? Text? Image? Video? Audio?

Accessibility approach? Blissfully ignorant? Anxiously ignorant? Forager? Farmer?



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Easy realities

JISC TechDis
Inclusion technology advice

- Can I change colours?
- Can I change font sizes significantly?
- Can I use without a mouse?
- Can I navigate quickly and easily?
- Will it work with speech technologies?
- Will it work with a screen reader?

Harder realities

Competencies v accessibility – eg electrical engineering.

Equivalence – essay .v. audio .v. video?

Balance – dyslexia/deaf .v. blind

Justification – “remove any disadvantage which is unjustifiable and maintain a record of any disadvantage which it believes to be justifiable, with reasons. Where the criteria or standards allow, some parts of the assessment could be made optional or replaced.”

On the radar

JISC TechDis
Inclusion technology advice

An overview of EDUPUB

	Current			Future
Theme	Features	Formats		A viable alternative
Content	Text content	HTML; Flash; PDF or proprietary content.	Metadata, standards & interoperability filter	EDUPUB (EPUB3 integrated with IMS Global and W3C standards) Accessible, interoperable and multiplatform support.
	Image content			
	Audio content	SWF; Quicktime; MPEG; MP3; Ogg; Wav; LaTeX; MathML		
	Video content			
	Maths content			
Activity and feedback	Interactive content	HTML; Flash; Javascript; proprietary content.		
Activity and feedback	Quizzes	HTML; Flash; Javascript; proprietary content.		
	Grade book			
Feedback and reflection	Personal feedback / communication	Commercial or open source tools; online services or plugins. HTML and proprietary formats.		
	Group feedback / communication			
	Data analytics	Caliper; Proprietary formats.		
Repository	File storage; remote access; editing.	VLE; cloud storage; ebook platforms.		

Alistair McNaught – Senior advisor Jisc TechDis

Part 2

Awarding bodies and the UK experience

Paul Nisbet
CALL Scotland
University of Edinburgh

Digital Question Papers in Scotland

- Traditional formal examination system using paper assessments
- Assessment Arrangements for candidates with disabilities or additional support needs
  - E.g. reader, scribe, ICT, papers in alternative format, etc
- Digital Question papers introduced in 2008, following pilot trials

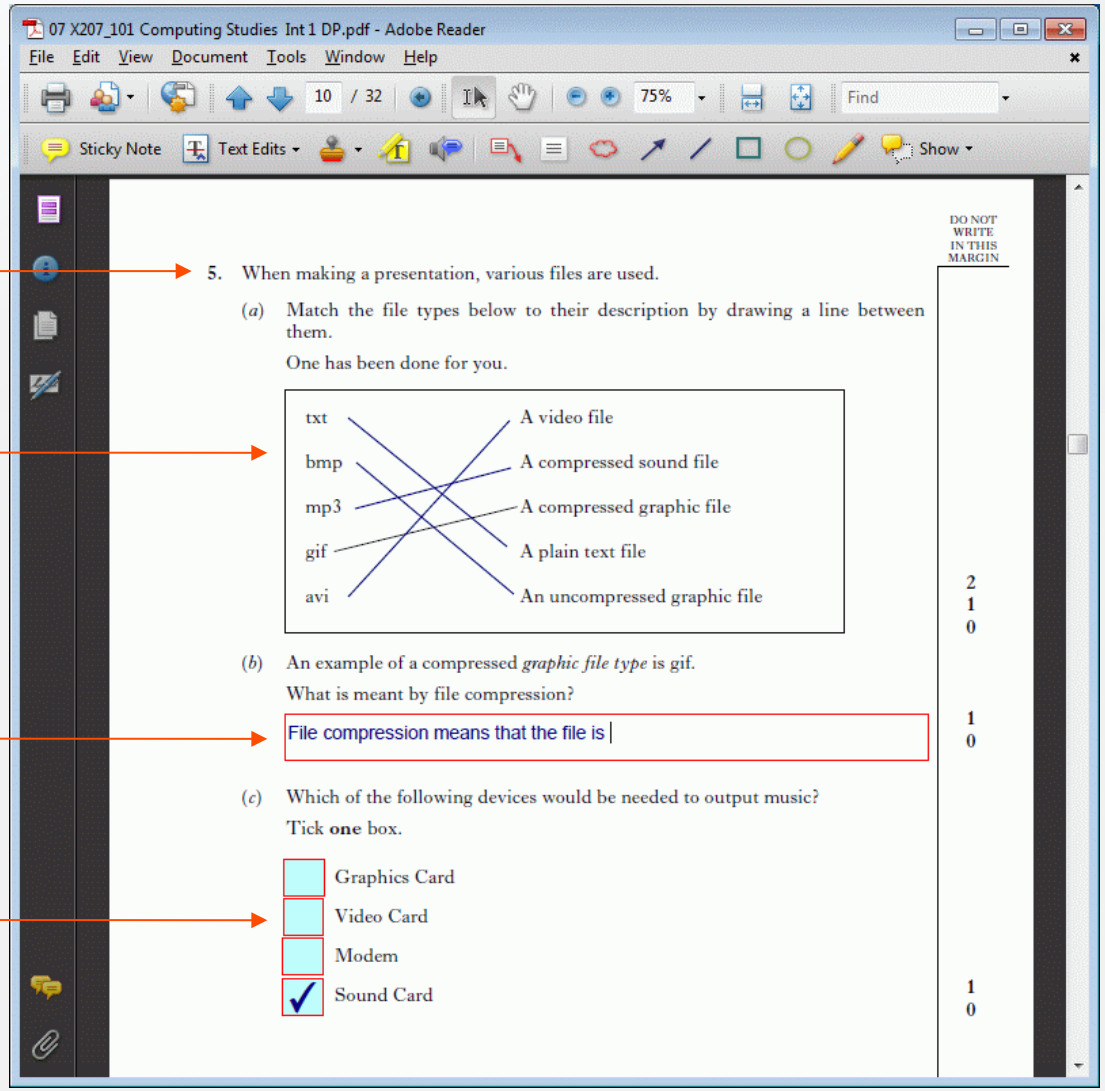
SQA Digital Question Papers - PDF

Read questions with text-to-speech (with free Scottish voices)

Use on-screen drawing tools

Type your answers

Click to tick



Why PDF?

- Accessible for majority of candidates who require Assessment Arrangements
- Free to access for schools and learners
- Inexpensive for SQA to produce
- Reliable and accessible on different platforms
- Pragmatic solution to the problem

FREE Scottish Voices from CALL Scotland

www.TheScottishVoice.org.uk

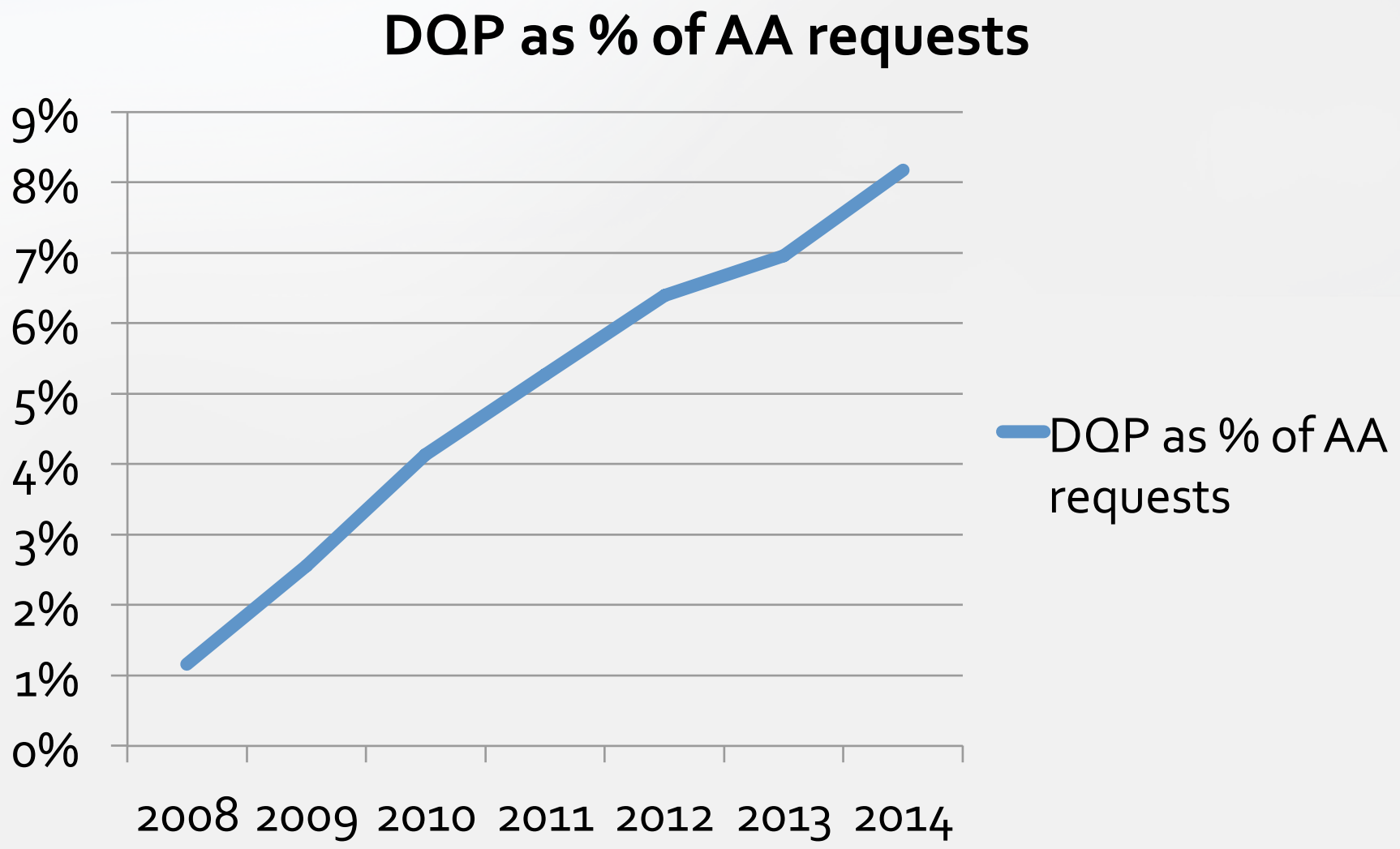
Limitations

- Not all papers are question and answer format with answer boxes on screen
- Some questions are designed for paper and do not work well on screen (maths/science in particular)
- Not well suited for blind users with screen readers

Digital Question Papers 2008 - 2014

	2008	2009	2010	2011	2012	2013	2014
Number of requests	514	1,167	2,000	2,832	3,694	4,291	3,540
Number of centres	46	73	101	149	173	188	191
Number of candidates	204	422	675	1,069	1,327	1,677	1,487
Mean number of requests per centre	11.17	15.99	19.80	19.01	21.35	22.82	18.53
Mean number of candidates per centre	4.43	5.78	6.68	7.17	7.67	8.92	7.79
Mean number of requests per candidate	2.52	2.77	2.96	2.65	2.78	2.56	2.38

Digital Question Papers 2008-14



Costs of readers/scribes

- 9,399 reader requests; 7,105 scribe requests
- ~ 18,000 individual exams
- ~ 27,000 hours
- Say average £20/hour for reader/scribe?

= £540,000

- Say £10/hour for invigilator?

= £270,000

- TOTAL = £810,000 in 2014

(£1.62m in Scotland in 2013!)

Exam boards in the rest of the UK

- PDF papers offered by exam boards for computer reader users from 2013.
  - Computer readers by 785 exams, compared to 50,971 "human" readers
  - No accessibility checks performed on PDFs
- Since working with exam boards, in 2014:
  - 2 of 5 boards provided question boxes in PDF papers
  - a board reported 1/3 of reader candidates using a computer reader
- Working towards implementing UKAAF minimum standards: Accessible PDFs For Examination Use http://www.ukaaf.org/

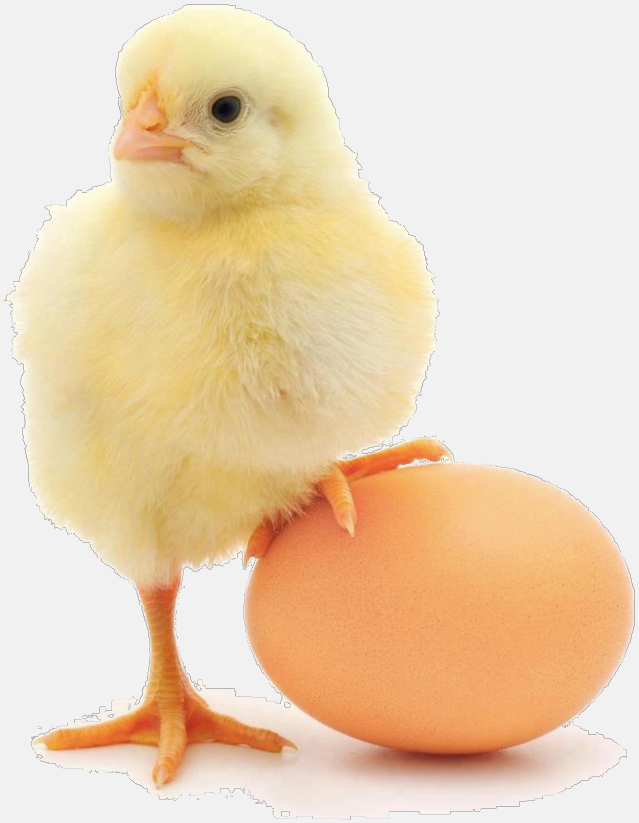
UK Association for Accessible Formats UKAAF

UKAAF Levels

- **Level 1** is a PDF version of the standard examination paper intended for use by sighted candidates who are print impaired. Candidates who choose to use this level may include those with dyslexia, reading difficulties, Autistic Spectrum Disorder, dyspraxia, mild visual impairment, learning difficulties or physical disability.
- **Level 2** 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.

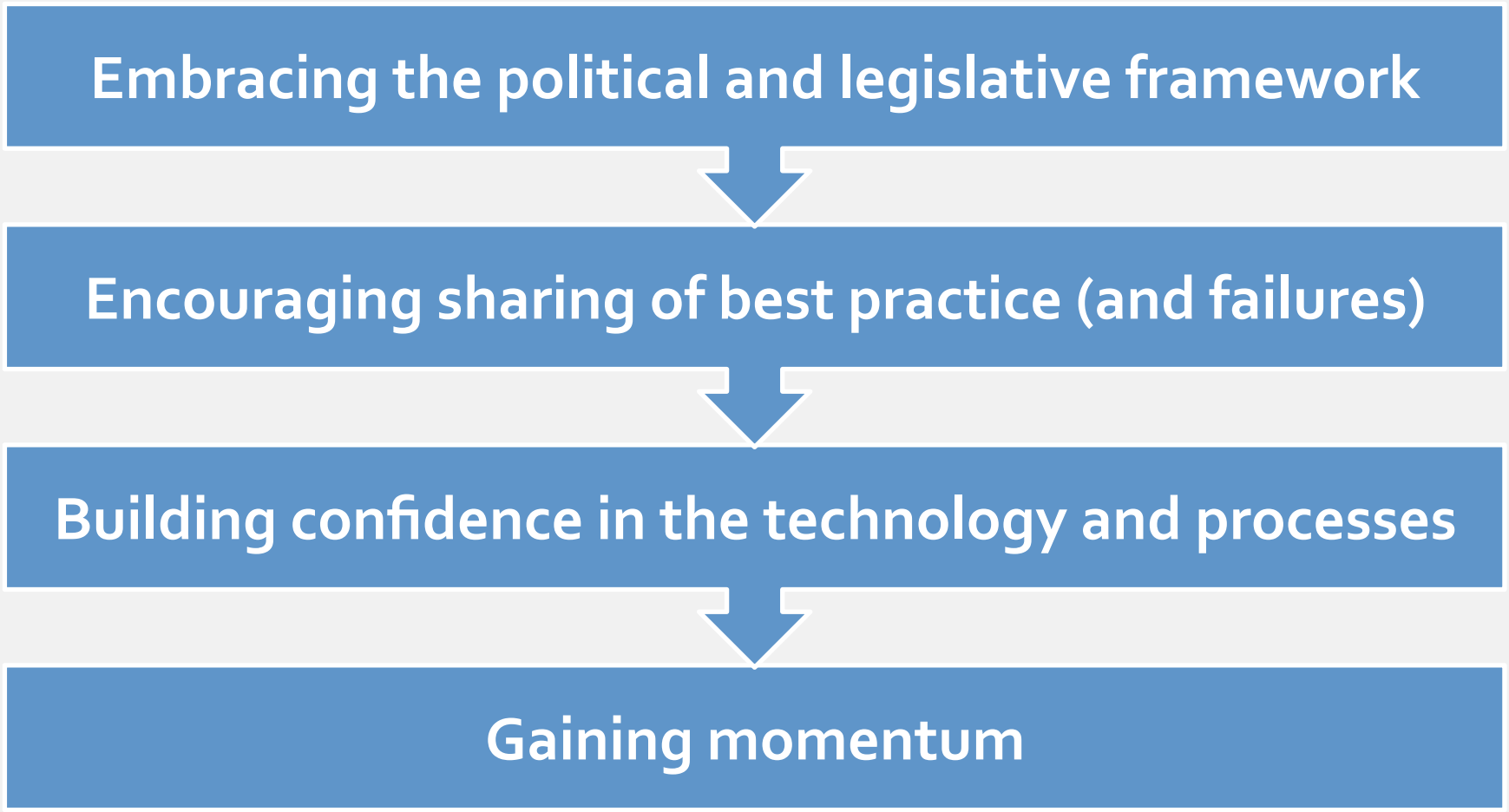
Part 3

Caveats and counting



Abi James
Chair, New Technologies Committee, British Dyslexia Association
University of Southampton

Making it reality, working with the learning community



Making it reality, working with exam boards

Accessibility Skills	• Unknown area to print DTP community. Limited access to staff in exam boards
Accessible Technology "creep"	• Organisations using older DTP tools and assessment technology with limited accessibility options
Managing risk	• Access arrangements and modifications are balanced against the risk to the assessment objectives and malpractice
Managing cost	• Accessibility and modifications are balanced against cost of implementation. Senior management/board buy-in is critical

Making it reality - but how to read aloud maths?

Most electronic maths is represented as images (PDFs, JPEGs, SVG)

- Alt-tags can be used to describe notation or for LaTeX or ASCI-maths
- But PDFs & Flash materials still provide significant barriers to accessibility
- SVG does allow for re-sizing of equations within images

BUT this is not the only barrier to speech rendering maths…

Difficulty with reading aloud maths:
1. Require symbol reading rules

Symbol notation has no direct phonetic information
Rules need to be available for voices to convert to speech

$a \leq 2$ "a is greater than or equal to 2"

$\mathbf{M} \subset \mathbf{N}$ "M is a subset of N"

Difficulty with reading aloud maths:
2. Maths is two dimensional

Maths is a 2-dimensional notation. Location of a symbol affects its meaning and how it should be spoken

GCSE question:

Circle the expressions that are equivalent to $4 \times x$:

x^4 $\quad$ $4x$ $\quad$ 4^x $\quad$ $x \times x \times x \times x$

Typical text to speech reads as:

"x 4" "4x" "4x" "x times x times x times x"

Difficultly with reading aloud maths:
3. Variations in how maths is spoken

How maths is spoken varies on context, cultural and maths knowledge of the reader

x^3 "x to the power of 3" or "x superscript 3" or "x cubed"

$1/4$ "1 over 4" or "a quarter" or "fraction 1 over 4"

Difficultly with reading aloud maths: 4. Reading maths without ambiguity

Maths when read aloud can mean different things

Example 1: "a plus b over 2":

(a) $a + \frac{b}{2}$ (b) $\frac{a+b}{2}$

Clearer alternative:

(a) "a plus open fraction b over 2 close fraction"

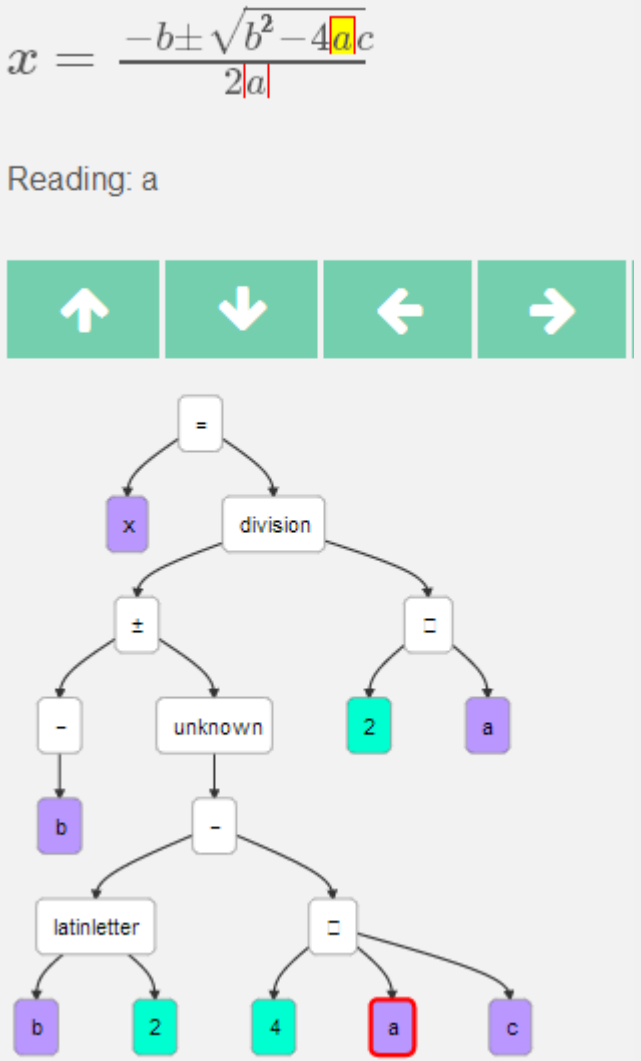
(b) "open fraction open brackets a plus b close brackets over 2 close fraction"

Solutions: MathML

- XML mark-up for maths included in HTML5 & ePUB3 standards
- Provides assistive technology with:
  - Unicode equivalents to symbols… to connect to reading rules
  - Semantic structure of notation… to define order and structure for audio rendering
- Currently limited support for MathML in browsers,
  - Use MathJax, an open source JavaScript display engine for mathematics

Solutions: assistive tools in development - STEMReader

- Navigate through an equation using the keyboard or tree
- Highlight location of variables within the equation as read aloud
- Provide users with different options for speaking equations
- www.stemreader.org.uk



But what about in an assessment? Speech rendering considerations

- Speech may impair the assessment objectives

e.g. Circle the expressions that is equivalent to $4 \times x$

x^4 $4x$ 4^x $x \times x \times x \times x$

- Maths reading rules needed to be developed for assessment environments

- Questions should be written appropriately:

"Write the notation to represent 4 multiplied by x"

But what about in an assessment? Accessible formats need to be adopted

- In the UK high-stakes assessment is still focussed on PDF and Flash
- Assessment authoring does not consider impact of speech rendering and accessibility
  - Expensive "modification" route used post-authoring and DTP instead
- Adoption of HTML5 and ePub3 limited by government focus on traditional paper-based exams

Useful links

- Jisc TechDis guidance on accessible assessment
  http://jisctechdis.ac.uk/techdis/resources/assessment
- CALL Scotland Adapted Digital Assessment site
  http://www.adapteddigitalexams.org.uk/Home/
- Web2Access tests for accessibility
  http://www.web2access.org.uk/

With thanks from your hosts

Professor Geoff Crisp,
Dean Learning and Teaching, RMIT University
geoffrey.crisp[at]rmit.edu.au

Dr Mathew Hillier,
Institute Teaching and Learning Innovation,
University of Queensland
mathew.hillier[at]uq.edu.au