

# Embedding QTI assessment in EPUB 3

balancing  
effectiveness with  
robustness

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## cetis

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# Overview

- A little about CETIS and me
- About the e-text books with embedded assessment experiment
- Scalable processes and standards
- Balancing effectiveness with robustness
- Demo
- Further work
- Conclusions
- Acknowledgements and links



# A l i t t l e a b o u t C E T I S a n d m e

- Cent re for Educat i onal Technol ogy and I nt eroperabi l i t y St andar ds
  - UK based
  - Si nce 1998
  - Ful l y funded by Ji sc at fi rst , now many cli ent s
- W i l b e r t K r a a n
  - W o r k e d o n I M S C o n t e n t P a c k a g i n g
  - W o r k e d o n I M S Q u e s t i o n a n d T e s t I n t e r o p e r a b i l i t y ( Q T I ) 2 . 1



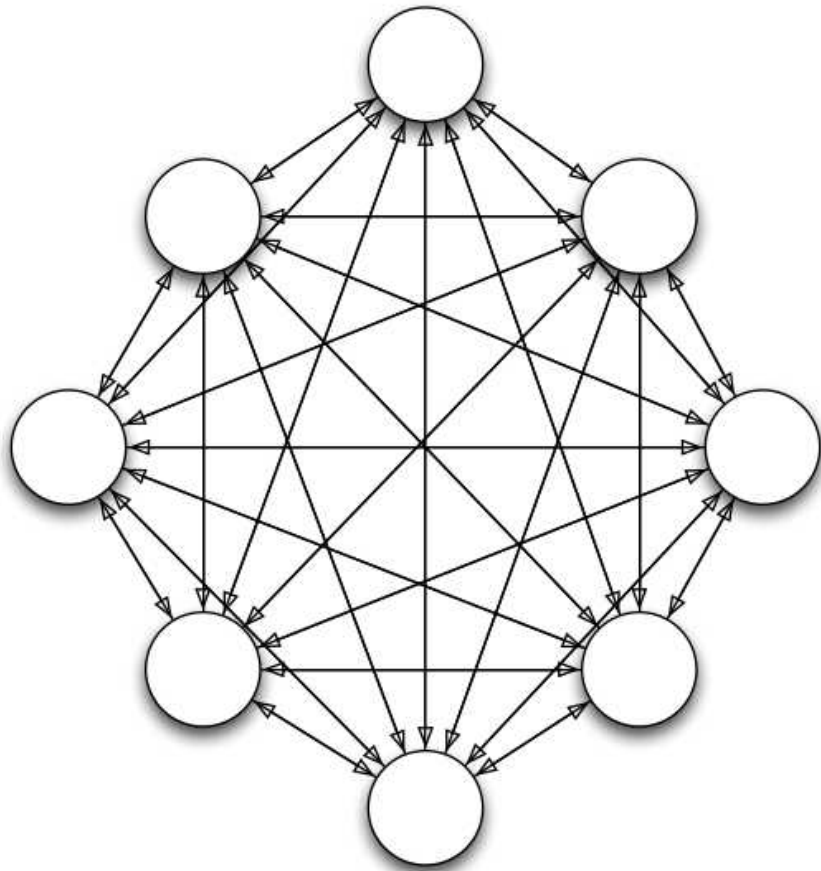
# About the e-text books with embedded assessment experiment

- The practical difference between books and text books: formative assessment
- Goal of the experiment: making electronic text books scalable, effective and robust

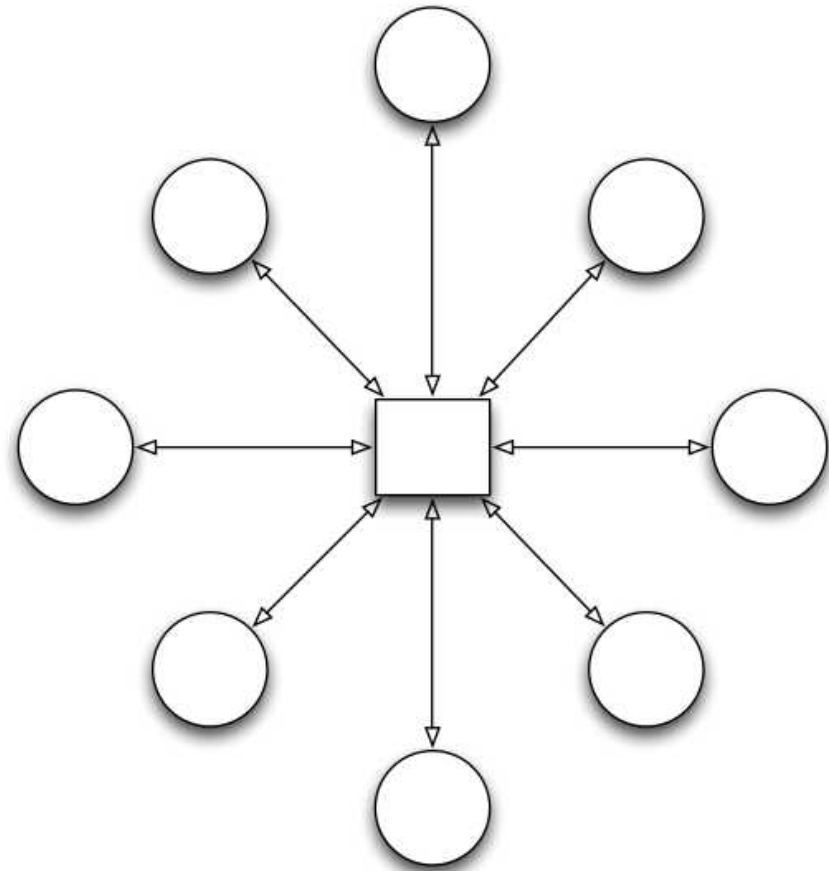


# Scalable processes and standards

- Why use interoperability standards?



**Symmetrical, many-to-many interoperability; 8 systems, 56 connections that need to work**



**Symmetrical, many-to-one-to-many interoperability; 8 systems, 16 connections that need to work**



# Balancing effectiveness with robustness

Most interactive

Most devices



EPUB3 to online quiz tool via IMS LTI

- Best experience
- Secure
- Quiz results return to college, analytics possible

But:

- Potential longevity issues
- May need work with e-reader vendors
- Needs an

QTI HTML + javascript inside EPUB3

- Good experience
- Reasonably long lived
- No server infrastructure

But:

- No results or analytics
- May need some work with e-reader vendors

Static QTI HTML inside EPUB3

- OK experience
- Long lived
- Works anywhere

But:

- No feedback
- No analytics
- No results (unless the user clicks a link)



# Reading

## Travel

When travelling, it is very important to read all signs carefully. Before we learn more about reading comprehension, let's take the following test.

### Unattended Luggage with feedback

Not Answered

Look at the text in the picture.



NEVER LEAVE  
LUGGAGE  
UNATTENDED

What does it say?

- You must stay with your luggage at all times.
- Do not let someone else look after your luggage.
- Remember your luggage when you leave.

[SUBMIT RESPONSE](#)

[Show model solution](#) [Exit](#)



# QTI Works results

Candidate Name <b>System Administrator</b>	Session Launched <b>Tuesday 29/10/13 at 18:02</b>	Session Status <b>Finished</b>
LTI Result Outcome Variable (SCORE) <b>100.0</b>	Normalized LTI Score <b>1.0</b>	LTI Result Return Status <b>LTI result return failed</b>

## Actions

- [Terminate Candidate Session \[already terminated\]](#)
- [View assessmentResult XML](#)
- [Download assessmentResult XML](#)

## All Outcome Variables

The current values of all outcome variables are shown below. Numerical variables are shown first, then other variables.

Outcome Identifier	Value
MAXSCORE	100.0
SCORE	17.452
duration	
completionStatus	unknown
FEEDBACK	ChoiceA





# i Books; of f l i ne, j avascr i pt wi dget

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English for speakers of other languages

## English for speakers of other languages

An intermediate course



## Travel

When travelling, it is very important to read all signs carefully. Before we learn more about reading comprehension, let's take the following test..

Look at the text in the picture.

**NEVER LEAVE  
LUGGAGE  
UNATTENDED**

What does it say?

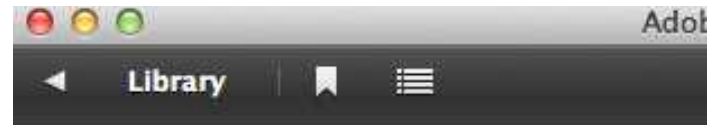
- You must stay with your luggage at all times.
- Do not let someone else look after your luggage.
- Remember your luggage when you leave.

OK

correct

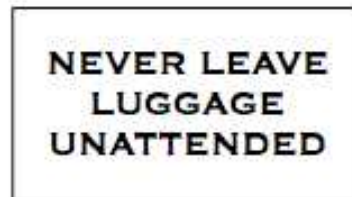


# Adobe Editions- static HTML



## Unattended Luggage

Look at the text in the picture.



What does it say?

- You must stay with your luggage at all times.
- Do not let someone else look after your luggage.
- Remember your luggage when you leave.

[Try the question online](#)



# Link to LMS from static HTML

TESOL You are logged in as System Administrator (Logout)

[Home](#) ▶ [Courses](#) ▶ [Miscellaneous](#) ▶ [tesol](#) ▶ 25 October - 31 October ▶ [Pre test](#)

## Unattended Luggage with feedback Model Solution

Look at the text in the picture.

**NEVER LEAVE  
LUGGAGE  
UNATTENDED**

What does it say?

- You must stay with your luggage at all times.
- Do not let someone else look after your luggage.
- Remember your luggage when you leave.

[Exit](#)



# Demo

- Valid EPUB3 ebook
- Uses the same valid IMS QTI 2.1 item in all contexts
- QTI 2.1 item is used in static and dynamic HTML5 forms using round-trippable transforms
- E-reader systems are stock, current versions



# Further work

- Test the solution beyond iBooks desktop, Readium desktop, Calibre and Adobe Digital Editions 2.0
- QTI 2.1 to HTML transforms are
  - Currently limited to multiple choice and fill-in-the-blank
  - Transforms need tweaking for this application
- QTI Works results reporting to 3d party LMS needs testing
- QTI Works might benefit from a better mobile user interface



# Concl usi ons

- EPUB3 combined with QTI 2.1 can provide formative assessment in e-textbooks that is scalable, effective and robust
- Fal l back mechanisms in EPUB3 enable engaging experiences in rich clients, whilst still supporting basic readers
- The standards don't require change, but industry consensus on EPUB3 + QTI 2.1 would help



# Acknowledgements and Links

- David McKain for [making QTI Works](#)
- Steve Lay for the [QTI HTML transformations](#)
- John Kristian of the OAuth project for the [OAuth javascript library](#)
- Stephen Vickers for the [ceLTIC IMS LTI development tools](#)

Code:

- <https://github.com/wilmTap/qtiEpub/>



# Li cence



This presentation *Embedding QTI assessment in EPUB3*  
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