

LRMI: using schema.org to describe open educational resources

Phil Barker & Lorna M Campbell



cetis

Centre for Educational Technology,
Interoperability and Standards

Motivation

Promote the sharing of educational resources by helping people find content that meets their specific needs.

Where do you think people go most often to find open educational resources?



Motivation



Photo by Vgrigas

Meet Pam, let's say she wants to teach a lesson about the *Declaration of Arbroath (1320)*



Tyninghame copy of the Declaration of Arbroath
By various Scottish barons



Motivation

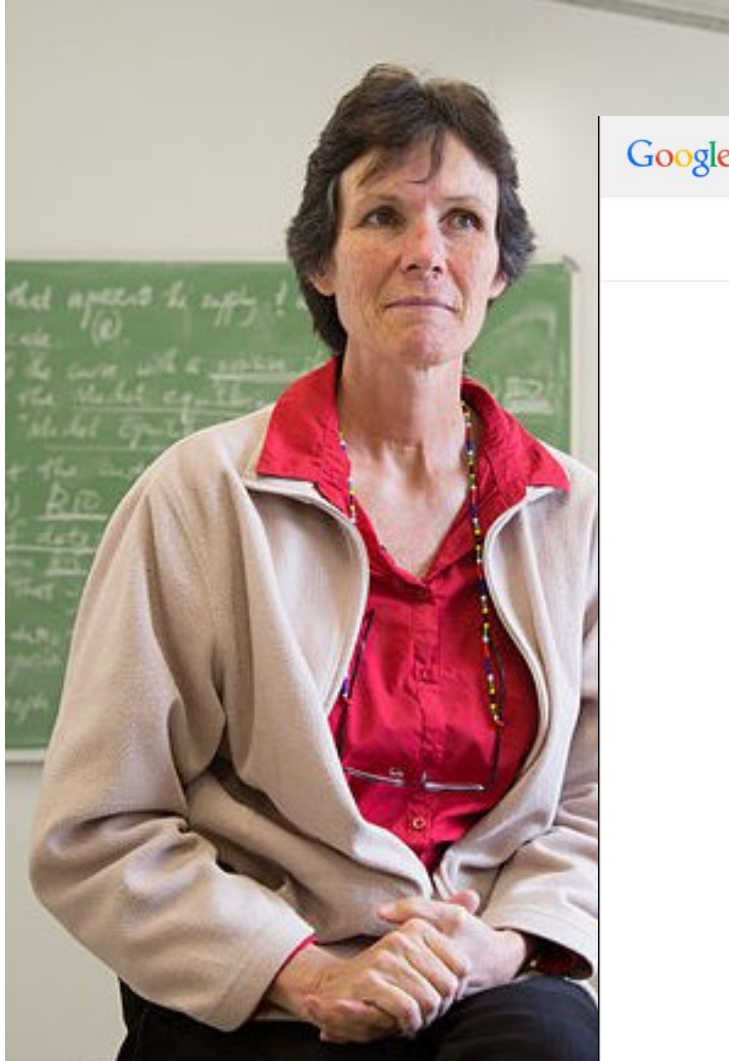


Photo by Vgrigas

She might search Google:

The screenshot shows a Google search for 'Declaration of Arbroath'. The search bar at the top contains the text 'Declaration of Arbroath'. Below the search bar, the Google logo is visible, along with navigation links for 'Web', 'Images', 'Shopping', 'Videos', 'News', 'More', and 'Search tools'. The search results show 'About 113,000 results (0.32 seconds)'. The first result is from Wikipedia, titled 'Declaration of Arbroath - Wikipedia, the free encyclopedia'. Below this, there is a section for 'Images for declaration of arbroath' with a grid of five image thumbnails. Further down, there are three more search results from 'The National Archives of Scotland', 'Constitution Society', and 'BBC - History - Scottish History'. A blue highlight box is present over the search results area, containing the text 'About 113,000 results (0.32 seconds)'.

Google Web Images Shopping Videos News More Search tools

About 113,000 results (0.32 seconds)

About 113,000 results (0.32 seconds)

Declaration of Arbroath - Wikipedia, the free encyclopedia
en.wikipedia.org/wiki/Declaration_of_Arbroath ▼
The **Declaration of Arbroath** is a declaration of Scottish independence, made in 1320. It is in the form of a letter submitted to Pope John XXII, dated 6 April 1320, ...

Images for declaration of arbroath Report images

[More images for declaration of arbroath](#)

Declaration of Arbroath - The National Archives of Scotland
www.nas.gov.uk/about/090401.asp ▼
13 Jan 2012 - This is a translation of part of the **Declaration of Arbroath**, foremost among Scotland's state papers and perhaps the most famous historical ...

Declaration of Arbroath 1320 - Constitution Society
www.constitution.org/scot/arbroath.htm ▼
The **Declaration of Arbroath** was and has been unequalled in its eloquent plea for the liberty of man. From the darkness of medieval minds it shone a torch upon ...

BBC - History - Scottish History
www.bbc.co.uk/history/.../features_independence_arbroath.shtml ▼
The **Declaration of Arbroath** is without doubt the most famous document in Scottish history. Like the American Declaration of Independence, which is partially ...



Motivation



Photo by Vgrigas

There are many educational parameters Pam might use to narrow the search results to those which are more appropriate, but Google doesn't support them. She is forced into a fragmented world of specialist search services based on (often siloed) metadata.



Metadata and resource description

*Metadata is **structured** information that describes, explains or otherwise makes it easier to retrieve, use, or manage and information resource*

NISO, 2004, "Understanding metadata"

<http://www.niso.org/publications/press/UnderstandingMetadata.pdf>



Metadata and full text search

----- REVIEW -----

... I'd also like to see real examples where just free-text content isn't enough to describe the resource and meta-data materially adds value.

Anon. Peer review comment for this paper



Author J. Cetis?

[\[PDF\] Open educational resources–Opportunities and challenges for higher education](#)

[J CETIS - 2008 - muele.mak.ac.ug](#)

Page 1. 1 Open Educational Resources – Opportunities and Challenges for Higher Education
Li Yuan; Sheila Mac eill; Wilbert Kraan JISC CETIS 1. Introduction Higher education institutions
around the world have been using the Internet and other digital ...

Cited by 69 [Related articles](#) [All 14 versions](#) [Cite](#) [Save](#) [More](#)

[\[PDF\] Learning Material Application Profile Scoping Study–final report](#)

[P Barker, J Cetis - JISC CETIS, 2008 - publications.cetis.ac.uk](#)

1. Summary This report details the findings of a scoping study carried out for the JISC to
investigate a potential metadata application profile for learning materials. The objective of
the study was to synthesize and analyse the advice that is currently available to managers ...

Cited by 3 [Related articles](#) [All 6 versions](#) [Cite](#) [Save](#) [More](#)

[The JISC Design for Learning Experience: Perspectives on Creating, Developing and S
for Learning.](#)

[S MacNeill, L Corley, J CETIS - ICALT, 2008 - doi.ieeecomputersociety.org](#)

Abstract This paper will a provide a summary of the current effort in the UK, through the Joint
Information Systems Committee (JISC) funded Design for Learning Programme, to
synthesise the approaches of e-Learning developers providing systems, services and ...

Cited by 2 [Related articles](#) [All 4 versions](#) [Cite](#) [Save](#) [More](#)

Screen shot from Google Scholar. NB, J CETIS = JISC CETIS, the author's affiliation



Schema.org

a joint effort, in the spirit of sitemaps.org, to improve the web by creating a structured data markup schema supported by major search engines.

Schema.org FAQ, <http://schema.org/docs/faq.html>



What the human sees

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Learning Resource Metadata Initiative: using schema.org to describe open educational resources.

By Phil Barker, Cetis, School of Mathematical Computer Sciences, Heriot-Watt University
Lorna M Campbell, Cetis, Institute for Educational Cybernetics, University of Bolton. April 2014

Abstract

This paper discusses the Learning Resource Metadata Initiative (LRMI), an international project that aims to facilitate the discovery of educational resources through the use of embedded metadata that can be used by search engines (e.g. Google, Yahoo, Bing, Yandex) to refine the search services they

Screen shot of a description of this paper



What the computer sees

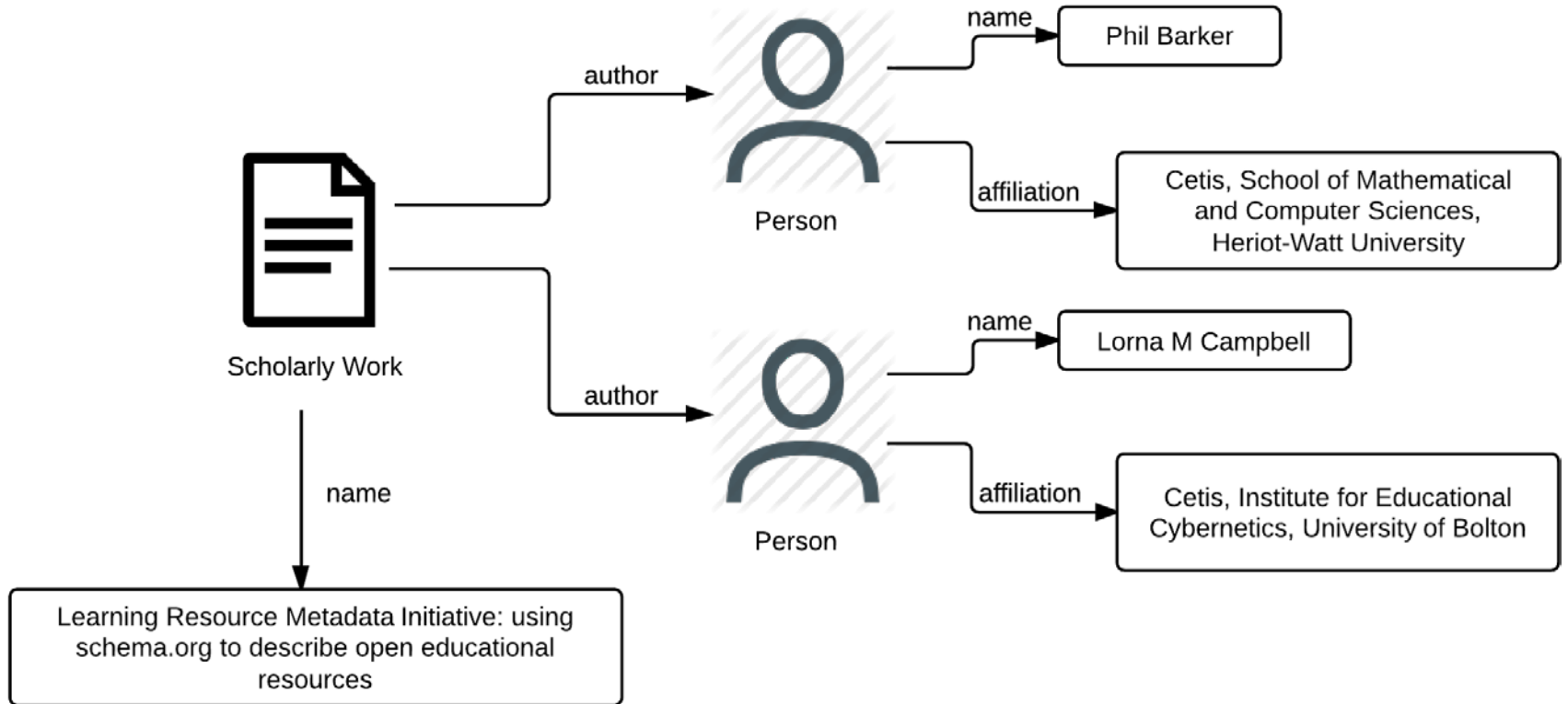
<h1>Learning Resource Metadata Initiative:
using schema.org to describe open educational
resources</h1>

<p>by Phil Barker, Cetus, School of
Mathematical and Computer Sciences, Heriot-Watt
University</p>

<p>Lorna M Campbell, Cetus, Institute for
Educational Cybernetics, University of Bolton.
April 2014</p>



What the computer needs



What schema.org provides

```
<div itemscope
itemtype="http://schema.org/ScholarlyArticle">
<h1 itemprop="name">Learning Resource Metadata
Initiative: using schema.org to describe open
educational resources</h1>
<p itemprop="author" itemscope
itemtype="http://schema.org/Person">
  <span itemprop="name">Phil Barker</span>,
  <span itemprop="affiliation">Cetis, School of
Mathematical and Computer Sciences, Heriot-Watt
University</span></p>
<p itemprop="author" itemscope
itemtype="http://schema.org/Person">
  <span itemprop="name">Lorna M Campbell</span>,
  <span itemprop="affiliation">Cetis, Institute
for Educational Cybernetics, University of
Bolton</span></p>
</div>
```



What schema.org provides

An agreed hierarchy of resource types.

An agreed vocabulary for naming the characteristics of resources and the relationships between them.

Which can be added to HTML to help computers understand what the strings or text mean.



What schema.org lacked (2011)



A way of tagging the educational parameters Pam might use to narrow her search results to those which are most appropriate.

Photo by Vgrigas



LRMI: Learning resource metadata initiative

Funded by the Bill and Melinda Gates Foundation since June 2011 (three phases)

Co-led by Creative Commons and AEP (preK-12 learning group division of the Association of American Publishers)

Working group including educators, publishers, metadata specialists

Aim:

make it easier to publish, discover, and deliver quality educational resources on the web



LRMI

schema.org didn't have a way of naming the educational parameters that could have helped Pam narrow her search, so LRMI added them.

- Educational alignment (more later)
- Educational use
- Interactivity type
- Is based on url
- Learning resource type
- Time required
- Typical age range
- Use rights URL
- Educational role (of target audience)

<http://www.lrmi.net/the-specification>



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<http://www.lrmi.net/the-specification>

A stamp with a checkmark icon and the text "DONE Added to schema.org April 2013*" in orange.

*except use rights URL



Educational alignment

An alignment to an established educational framework, e.g.

- Shared curriculum or syllabus
- Shared framework of competency requirements
- Set of educational levels
- Modules making up a course

Allows encoding of statements like

“this resource teaches X”

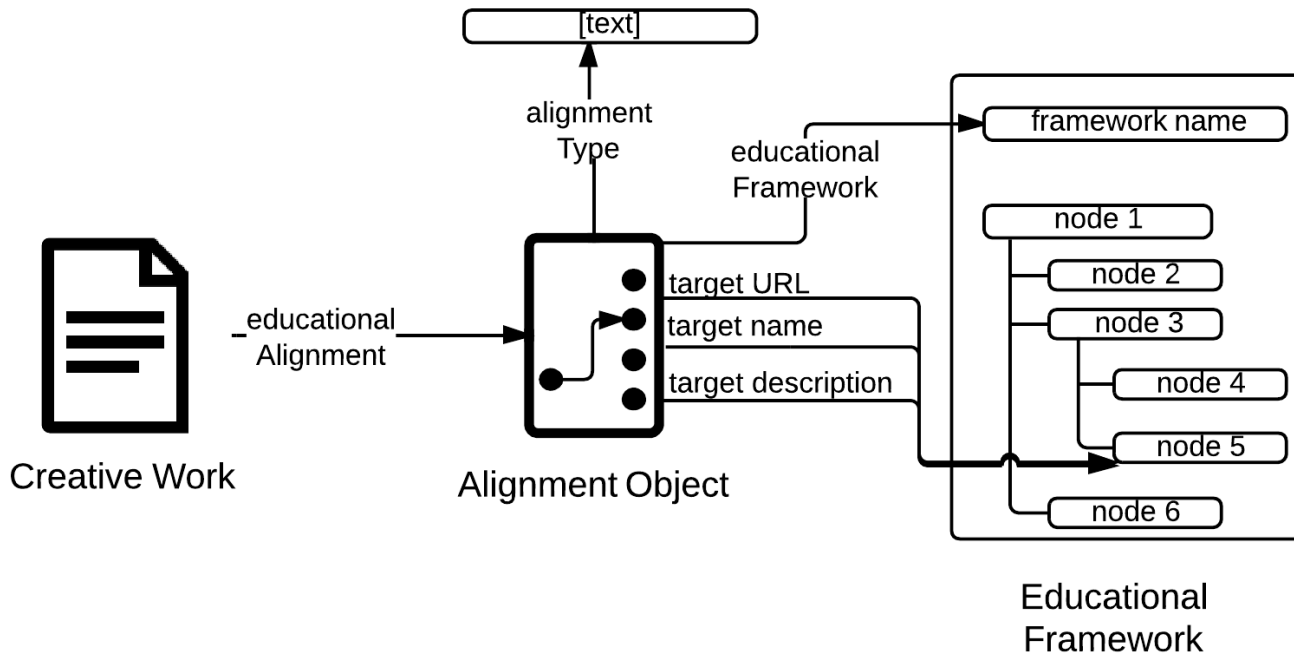
“this resource assess X”

“this resource requires knowledge of Y”



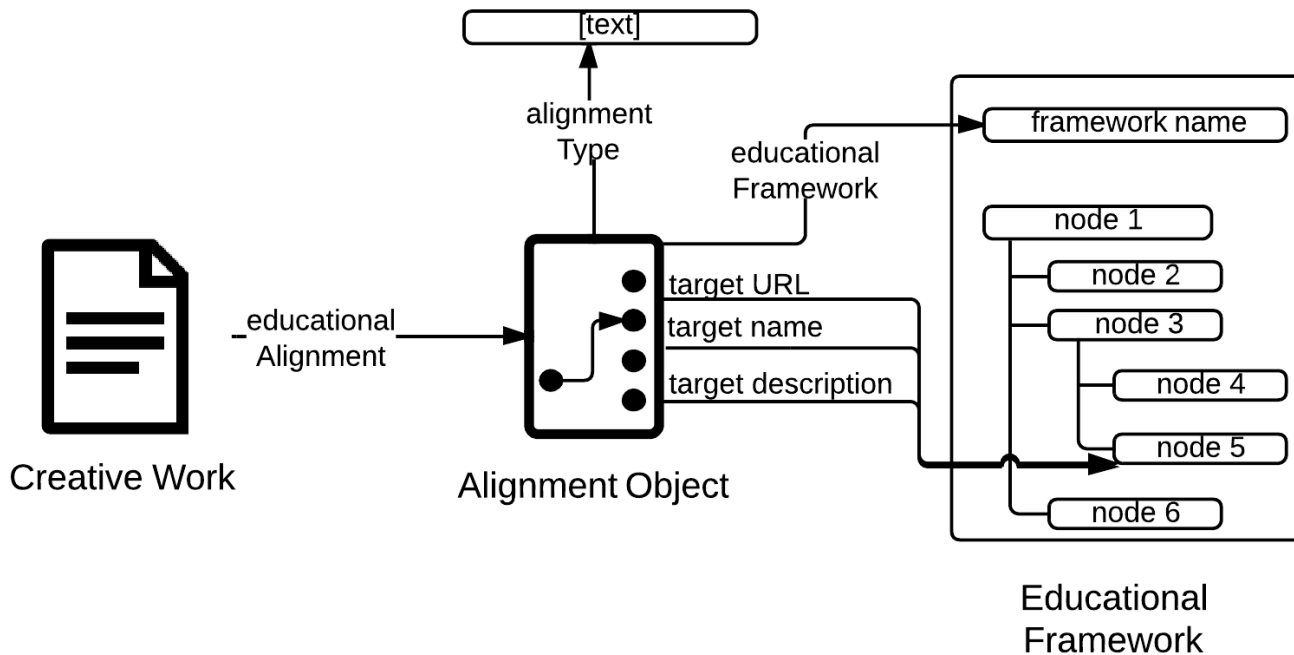
Educational alignment

An alignment to an established educational framework



Educational alignment

LRMI elements identify something in an educational framework, they do not describe it.



Google custom search engine

Google custom search allows you build a Google-powered search limited to a list of domains or schema.org types, and filtered according to schema.org properties.

For example:

- limit searches to pages that have an Alignment Object (pages that describe learning resources)
- filter by alignment with what you want to teach

<http://bit.ly/lrmiProtoSearch>



Plain Google search

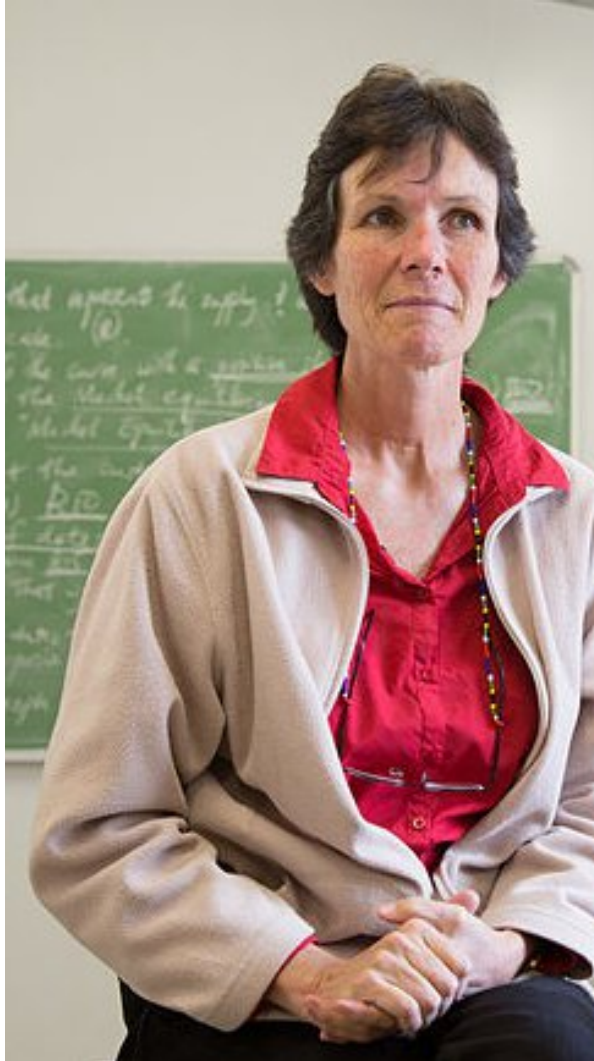



Photo by Vgrigas

Google **Web** Images Shopping Videos News More Search tools

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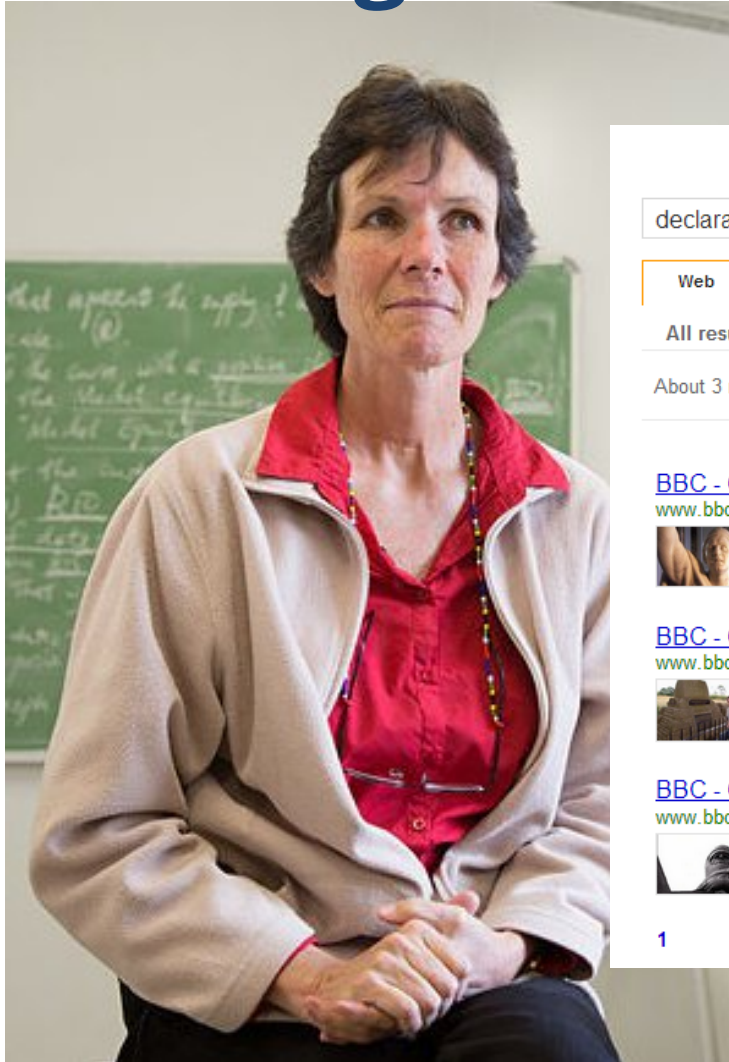
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www.bbc.co.uk/history/.../features_independence_arbroath.shtml ▼
The **Declaration of Arbroath** is without doubt the most famous document in Scottish history. Like the American Declaration of Independence, which is partially ...



Google custom search



declaration of arbroath

Web Image

All results **GCSE** Intermediate university level Introductory university level US grade 6

About 3 results (0.09 seconds) Sort by: Relevance

powered by Google™ Custom Search

[BBC - GCSE History - Declaration of Arbroath](#)
www.bbc.co.uk/education/clips/z3sjtfr
What it meant for Robert the Bruce to be excommunicated and the **Declaration of Arbroath**.

[BBC - GCSE History - William Wallace](#)
www.bbc.co.uk/education/clips/z9v7pv4
Newport's medieval ship - Play Wallace's death. Wallace's death - Play. **Declaration of Arbroath** - All GCSE The Middle Ages (12th to 15th century) videos ...

[BBC - GCSE History - The Battle of Stirling Bridge](#)
www.bbc.co.uk/education/clips/zgy7pv4
Declaration of Arbroath. Play. The early life of Owain Glyndŵr. Play Newport's medieval ship. Newport's medieval ship. All GCSE The Middle Ages (12th ...

1

Photo by Vgrigas



Google custom search

Feel free to try it out, try “grammar”

but remember:

It's a proof of concept , not a service

It doesn't used all parameters available through
LRMI

<http://bit.ly/lrmiProtoSearch>



Questions?

- Educational frameworks tend to be local, if something is aligned to a UK standard how do people in the South Africa find it?
- How do you describe the educational frameworks?
- What vocabularies should we use for other LRMI elements?
- How can you describe someone else's resources?
- Can you use LRMI/schema.org for creating stand-alone metadata records?
- Can you use LRMI/schema.org in other resource formats (e.g. EPUB)?
- Can you use LRMI to describe other types of things (events, OpenBadges...)?



Conclusion

- LRMI have enhanced schema.org so that it better supports open web searching for learning resources.
- What is really needed for success is for
 - 1) more search services &
 - a) more resource dissemination channels to use it.
- We will support that with advocacy, advice, sharing best practice, stable governance for LRMI



Attributions

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Pam really is a teacher but I have no idea whether she would want to teach anything related to the declaration of Arbroath
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