



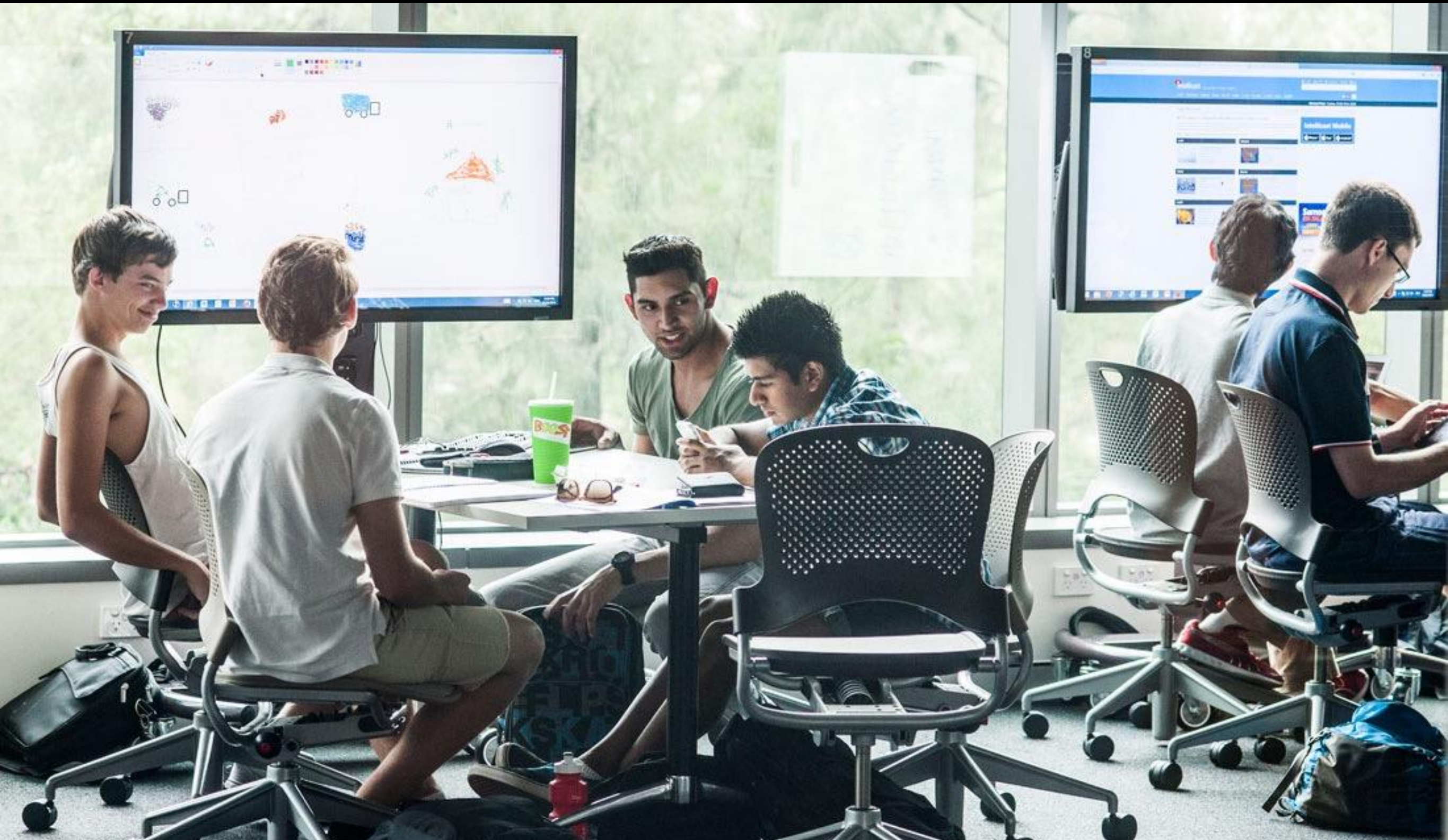
Data Interoperability  
Standards Consortium

# USING EXPERIENCE API



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[@KirstyKitto](https://twitter.com/KirstyKitto)

# HOW MUCH DATA DO YOU HAVE?

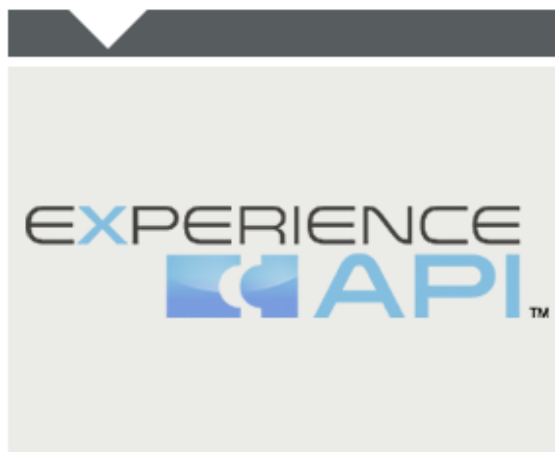




# THE EXPERIENCE API

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## Experience API

[Home](#) / [Research: Our Focus](#) / [Performance Tracking & Analysis](#) / [Experience API](#)

### The xAPI Overview

Many learning experiences in the modern world occur outside of a Learning Management System (LMS) and a web browser. The Experience API (xAPI) specification is flexible. It releases us from the constraints of only being able to track web-based formal learning; in addition, it is capable of tracking informal learning, social learning, and real world experiences. Example learning activities that can be tracked include reading an article, watching a training video, participating in a virtual world with augmented

reality or simulation, using a mobile application, or having a conversation with a mentor.

When a learner completes a learning activity, a simple human and machine readable activity statement is generated in a < actor >< verb >< object > format. Previous technologies require programming knowledge to understand the data, but with the activity statement format anyone in the learning process can interpret it. These statements are validated by and stored in a Learning Record Store (LRS).

### Additional Resources

- ✓ [xAPI Technical Specification](#)
- ✓ [ADL Sample LRS](#)
- ✓ [ADL's Controlled Vocabulary](#)
- ✓ [Choosing an LRS](#)

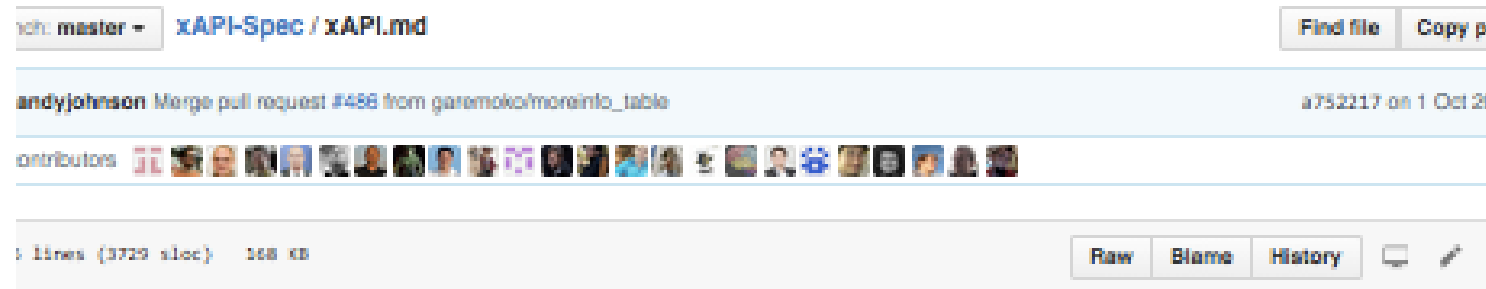
### Open Source Tools from ADL

- ✓ [ADL LRS](#)
- ✓ [xAPI Wrapper](#)
- ✓ [xAPI Statement Viewer](#)

ps://www.adlnet.gov/adl-research/performance-tracking-analysis/experience-api/

# WHAT IS IT?

- xAPI is a (not so) new educational data standard that is intended to replace SCORM
- Much more flexible and extensible (learning happens anywhere)
- Minimally requires JSON statements of <actor><verb><object> form..
- ..but can store information about <context>, <result>, <ID>.. anything!
- Open – anyone can contribute! Fast and flexible solution capable of dealing with rapidly changing technology climate



## Experience API

### Advanced Distributed Learning (ADL) Co-Laboratories

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This document was authored by members of the Experience API Working Group (see list on pp. 7-8) in support of the Office of the Deputy Assistant Secretary of Defense (Readiness) Advanced Distributed Learning (ADL) Initiative. Please send all feedback and inquiries to [helpdesk@adlnet.gov](mailto:helpdesk@adlnet.gov)

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OPEN DOES NOT IMPLY CHAOS!

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## Broad Agency Announcement (BAA)

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# Broad Agency Announcement (BAA)

ADL's contract vehicle for collaboration with external vendors

## BAA PROCESS:

ADL collaborates with external vendors and academic institutions through our Broad Agency Announcement (BAA). BAAs are the U.S. Government's competitive solicitation procedure to contract for basic and applied research and development. ADL uses our BAA to contract for **Advanced Technology Development** (budget activity 6.3).

## FY17 Focused Areas of Research

ADL conducts research in **six focus areas** (e-learning, m-learning, learning theory, web-based virtual worlds and simulations, learning analytics and performance modeling, and interoperability infrastructure). ADL is always seeking good research ideas related to these areas; however, based upon requirements collection and strategic guidance, we may identify particular *Topics of Interest* periodically. In other words, we are especially interested in R&D projects that help meet these topics of interest (listed below) but remain open to other good ideas, so long as they fall within our mission. For FY17 (and to inform the ADL FY17 Broad Agency Announcement), our topics of interest are below.

## How to Participate

The **official FY17 BAA solicitation (number W911QY-BAA-FY17)** is available on **FedBizOpps**. A summary is provided below for convenience, but all submissions must follow the guidelines defined in the FedBizOpps solicitation. (If a conflict exists between this summary and the directions provided on FedBizOpps, defer to the FedBizOpps guidance.) [Click here to view the FedBizOpps listing.](#)



### Step ONE

Quad Chart submissions are the first step in the process. Quad Charts may be

# FROM THE FY16 ADL BAA

## How should xAPI Data Interoperability work?

In other words, what are the qualities of xAPI-enabled software that make it “plug and play?” How does one xAPI-enabled software work with other xAPI-enabled software? How do you know when it’s working? What are your expectations for what should be configured? Furthermore, what these technologies should do by default to work with other xAPI-enabled technologies?

From your input, we’ll draw requirements for three projects on which we’re working with ADL and the xAPI Community. As a result, your participation informs...

1. Technical conformance tests that assess how well software follows the xAPI specification
2. Software certification tests that evaluate how well software meets with stakeholder expectations for interoperability
3. Professional certification tests that evaluate the competency of people who work with xAPI.



Created by anbilenu adaleru  
from Noun Project

## How can you get involved?

Right now, there are a two ways you can help.

### All xAPI Enthusiasts

For every stakeholder of xAPI, [this link will take you to an idea-gathering platform we’re using to gather input on the above question](#)

### Very Technical xAPI Friends

For the very technical professionals who are responsible for developing and implementing systems that must interoperate with other systems that use xAPI, [this link will take you to an requirements-gathering platform](#)





**Data Interoperability  
Standards Consortium**

## PRIORITIES THROUGH TO 2017

- specification conformance requirements
- software certification
- professional certification

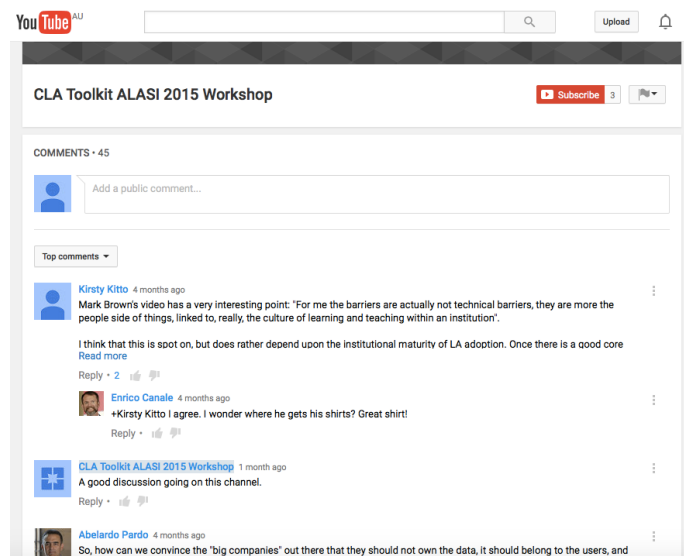
Longer term goal to make xAPI easier to use while promoting data sovereignty, security and semantic interoperability



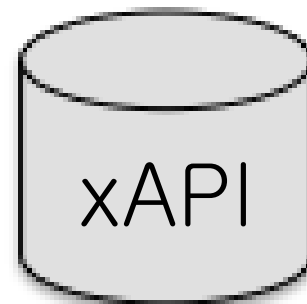
BUT HOW DO I USE IT?

# THE CONNECTED LEARNING ANALYTICS TOOLKIT

social media



Learning Record Store



scraping

analysis

```

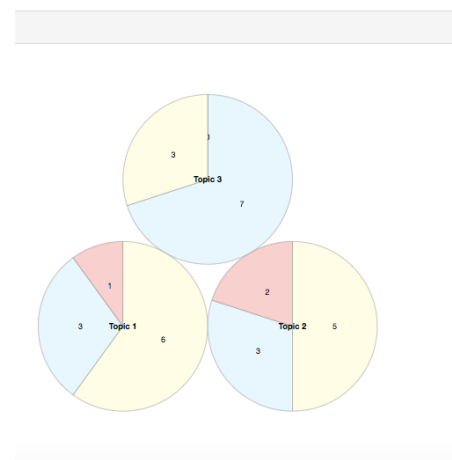
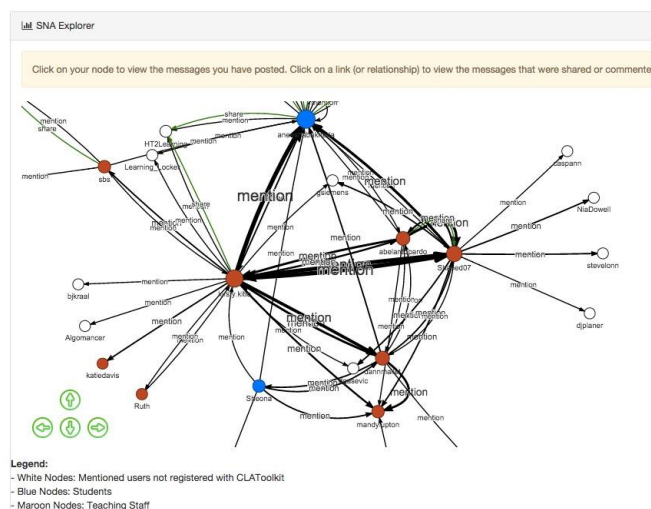
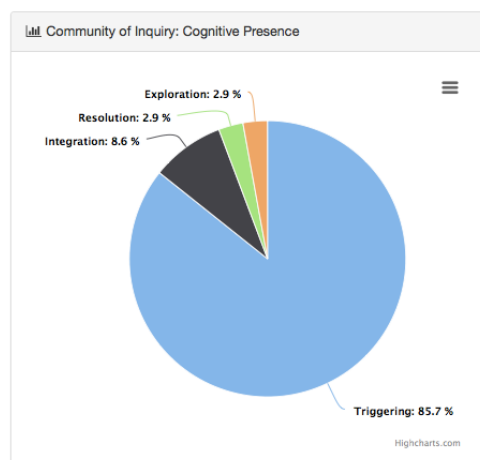
330 class TOPICMODELVIEW(Defaultsmixin, APIVIEW):
331
332     def get(self, request, *args, **kw):
333
334         course_code = request.GET.get('course_code', None)
335         platform = request.GET.get('platform', None)
336         start_date = request.GET.get('start_date', None)
337         end_date = request.GET.get('end_date', None)
338         num_topics = int(request.GET.get('num_topics', None))
339
340         result = json.loads(get_LDAPVIS_JSON(platform, num_topics, cour:
341         response = Response(result, status=status.HTTP_200_OK)
342         return response
343
344 class MLCLASSIFY(Defaultsmixin, APIVIEW):
345
346     def get(self, request, *args, **kw):
347
348         course_code = request.GET.get('course_code', None)
349         platform = request.GET.get('platform', None)
350
351         result = classify(course_code,platform)
352         response = Response(result, status=status.HTTP_200_OK)
353         return response
354
355 class MLTRAIN(Defaultsmixin, APIVIEW):
356
357     def get(self, request, *args, **kw):
358
359         course_code = request.GET.get('course_code', None)
360
  
```

learning analytics

students

academics

admin & developers



LRS List				
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Kirsty's LRS		1	2015-05-09 11:00:05	<input checked="" type="checkbox"/>
Mandy's LRS		1	2015-05-11 23:02:19	<input checked="" type="checkbox"/>
James's LRS		1	2015-05-11 23:02:35	<input checked="" type="checkbox"/>
Abelardo's LRS		1	2015-05-11 23:03:03	<input checked="" type="checkbox"/>
Shane's LRS		1	2015-05-11 23:03:49	<input checked="" type="checkbox"/>
Grace's LRS		1	2015-05-11 23:04:23	<input checked="" type="checkbox"/>
Zak's LRS		1	2015-05-11 23:04:49	<input checked="" type="checkbox"/>
Seb's LRS		1	2015-05-11 23:05:00	<input checked="" type="checkbox"/>
Simon's LRS		1	2015-05-11 23:05:36	<input checked="" type="checkbox"/>
Aneetha's LRS		1	2015-05-11 23:32:10	<input checked="" type="checkbox"/>

- Kitto, Cross, Waters, Lupton. (2015). Learning Analytics beyond the LMS: the Connected Learning Analytics Toolkit. In LAK '15. ACM, pp11–15.
- Bakharia, Kitto, Pardo, Gasevic, Dawson (2016) Recipe for success — Lessons learnt from using xAPI within the Connected Learning Analytics toolkit. In LAK'16. ACM, pp370–378.

# THIS PROJECT IS SUPPORTED BY THE AUSTRALIAN GOVERNMENT'S OFFICE FOR LEARNING AND TEACHING

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UNIVERSITY OF SYDNEY

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UNIVERSITY OF TEXAS (ARLINGTON)

George Siemens



# RECIPES, VOCABULARIES, PROFILES

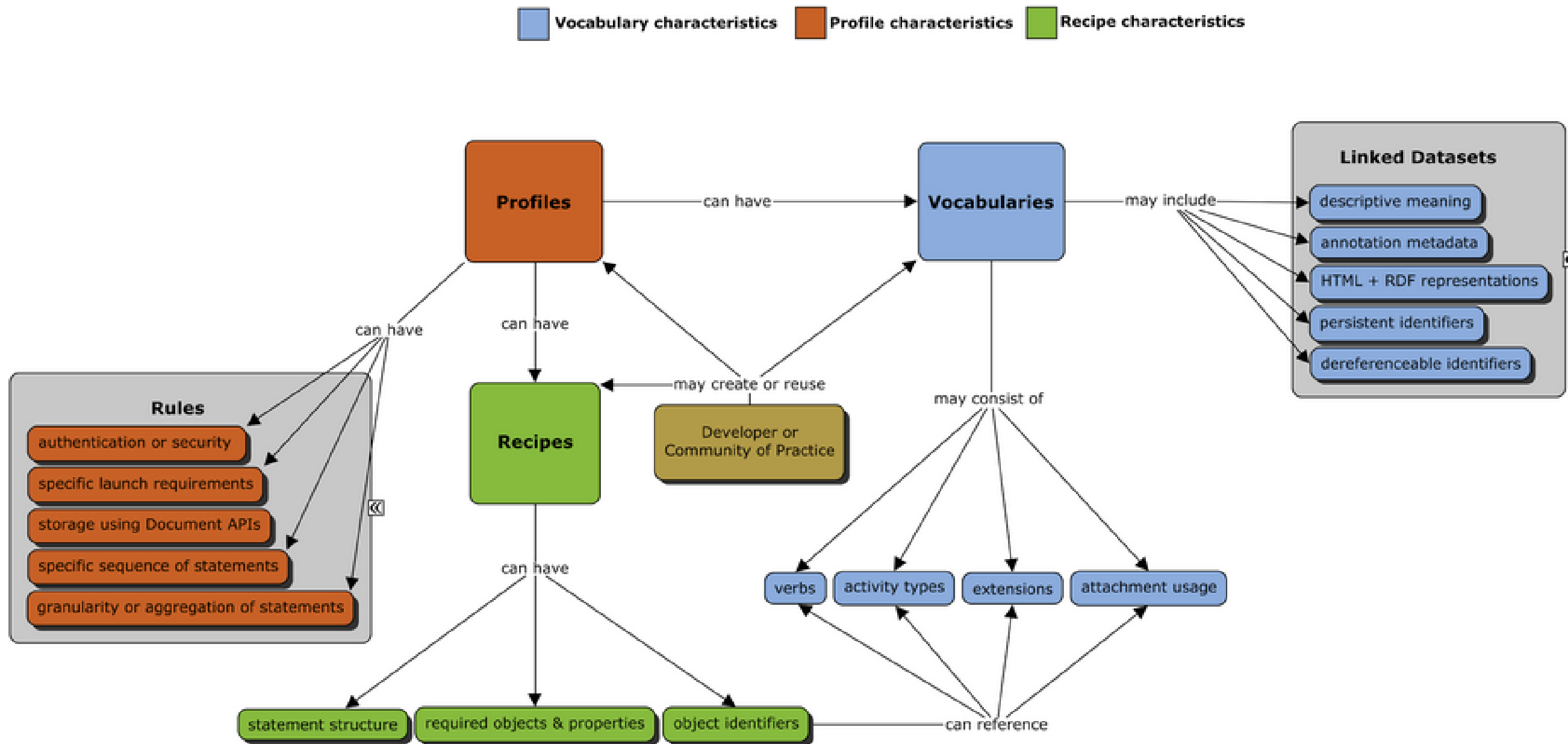


Figure 3. Relationship between vocabularies, profiles, and recipes.

# HIGH LEVEL PROFILES AND RECIPES

- Analysis across different platforms made easier with early planning
- Recipes are essential!
  - Microblogging
  - Content Creation
  - Collaborative Content Authoring
  - Content Curation
  - Association with Course, Team and Instructor

Bakharia, Kitto, Pardo, Gasevic, Dawson (2016) Recipe for success — Lessons learnt from using xAPI within the Connected Learning Analytics toolkit. In LAK'16. ACM, pp378–382

<https://github.com/kirstykitto/CLRecipe>

## Modeling Social Media Interaction as an xAPI statement

The CLRecipe project:

- maps terminology from various social media platforms to a common set of objects and verb
- provides an xAPI Recipe for building xAPI statement for modeling social media interactions that include the relationship between social media posts (i.e. reply, share and like) so that advanced analytics (including content analysis and social network analysis) can be performed
- provides xAPI recipe examples for Microblogging, Content Authoring, Content Collaboration and Content Curation

Though social media platforms use different terminology, a common model of interaction exists (see figure below). The model involves:

- A user can create a post. The post could be a short microblog post or a full article.
- A user can optionally including tag/s, hashtag/s or mention other users when creating the post.
- Other users can share a post (i.e. for their followers to view) and optionally including a comment.
- Other users can replying to the original post.
- Other users can rate the original post.



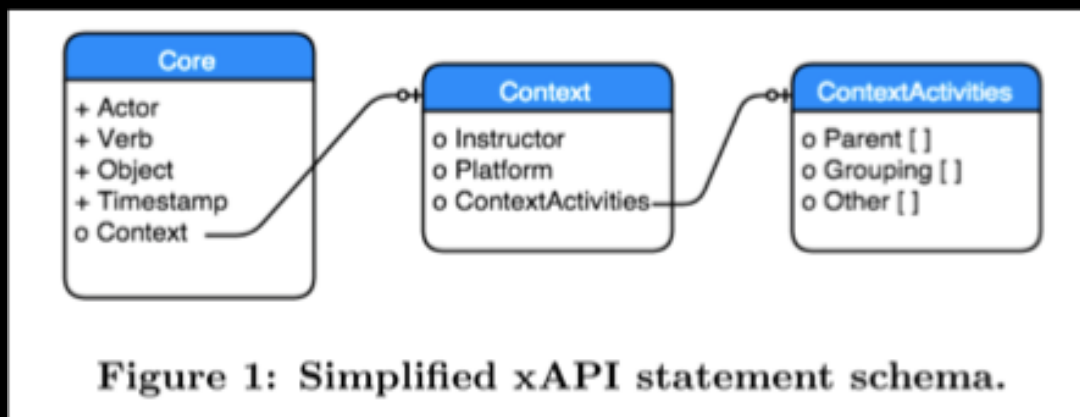
The Recipe for representing social media activity as xAPI statements prescribes that:

- A common set of verbs and objects must be used to represent activity across all social media platforms. Terminology used by specific platforms like Twitter and Facebook is mapped to a standard set of object and verbs (e.g. A 'Tweet' and Facebook Timeline post will both be mapped to the Note object; Twitter 'Favorite' and Facebook 'Like' will be represented by the 'like' verb).

# DATA STRUCTURE

## CONNECTED LEARNING RECIPE

<https://github.com/kirstykitto/CLRecipe>



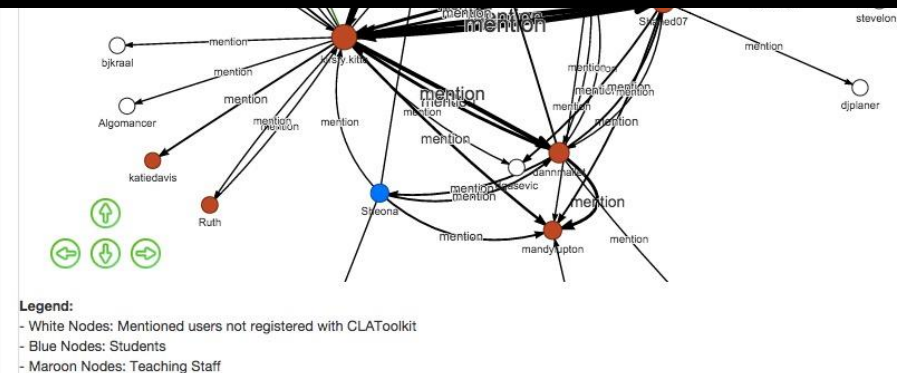
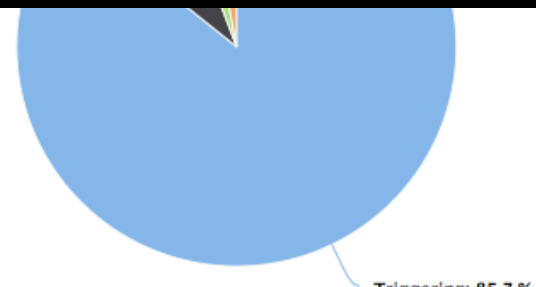
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  },
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    "contextActivities": {
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      "other": [
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      },
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    },
    "id": "https://twitter.com/aneesha/status/597971744180174848",
    "objectType": "Activity"
  },
  "verb": {
    "display": {
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    "id": "http://activitystrea.ms/schema/1.0/create"
  }
}
```



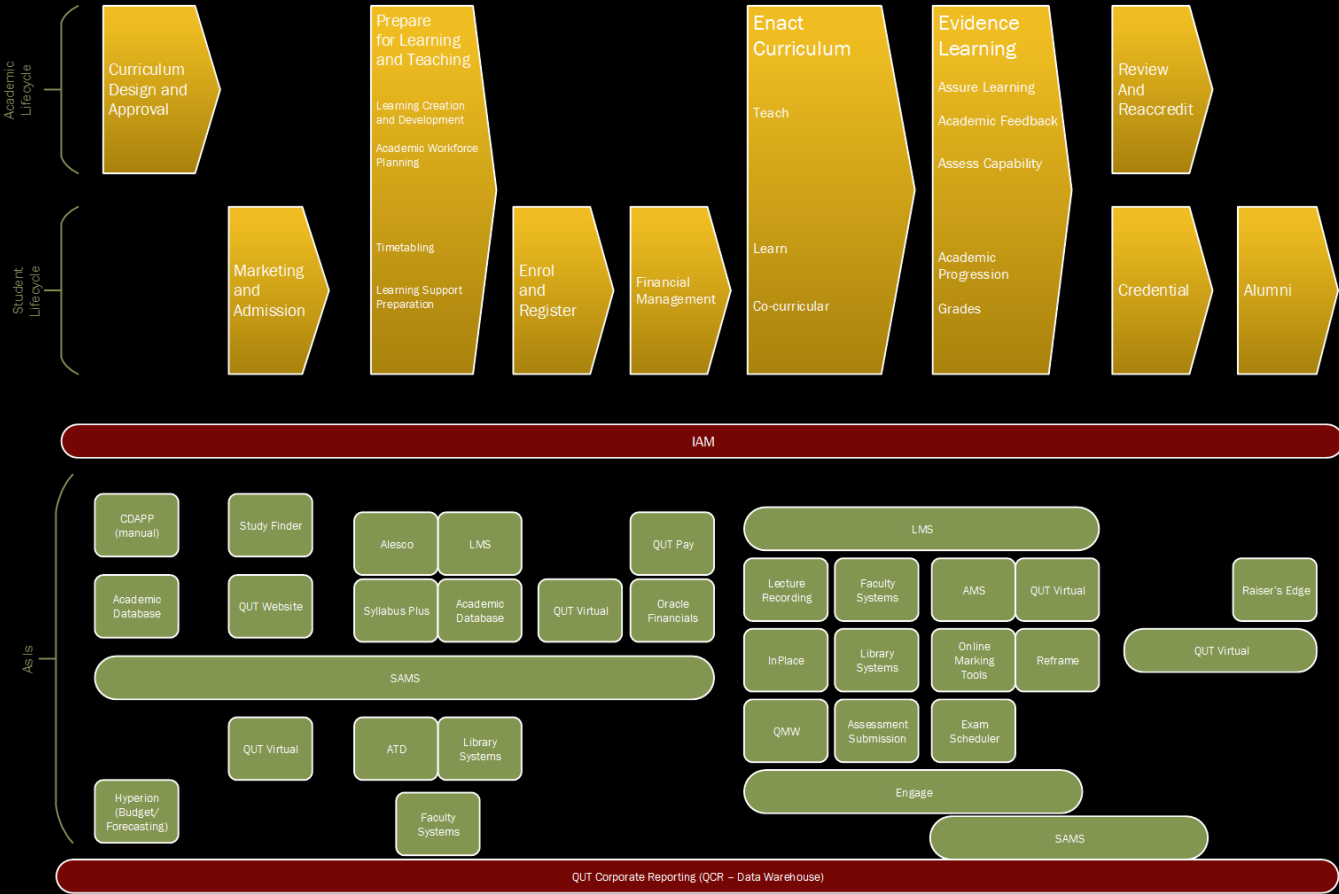
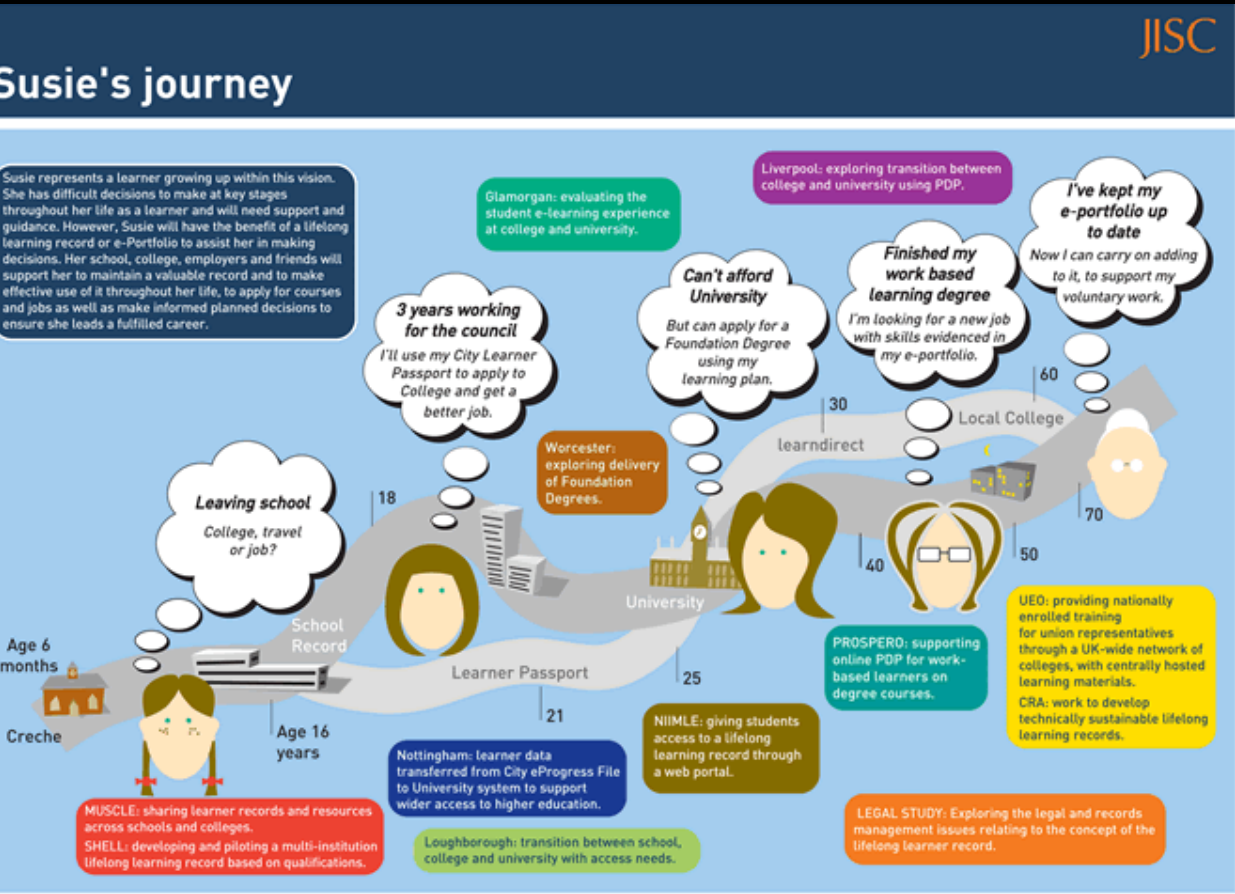
[illegible]

ave

July 28, 2011



MY NEXT STEPS?



DATA TO ASSIST WITH LIFE  
LONG PERSONALISED LEARNING

impossible without data  
interoperability  
between all educational data formats



# THANKS!

- To the students who have actively worked on the CLA toolkit  
Big contributors: Zak Williams, Seb Cross, Koji Nishimoto
- To the beyondLMS project team, and Aneesha Bakharria (who contributed substantially to the project in 2015)
- To the xAPI Community
- Megan Bowe and Aaron Silvers
- KERIS, and especially Yong-Sang for the organisation of LASI-Asia!