Measuring Information and Digital Literacy Activities through Learning Record Store Repository of the NTC for CE of Librarians in Croatia

Dijana Machala, PhD
Marko Orešković, PhD student
National and University Library, Zagreb, Croatia

Research Aim

- Identify and analyze information and digital activities of librarians through the learning portal
  - analyze learning record data at the learning record store repository of the NTC for CE of Librarians in Croatia
  - test application of an Experience API (xAPI) as an information and digital literacy assessment instrument

Information and Digital Literacy

- viewed from the aspect of instructional design and innovative training and learning architecture standards

  - Digital literacy
    - ability to use information and communication technologies to **find**, **understand**, **evaluate**, **create**, and **communicate** digital information – ability that requires both cognitive and technical skills (ALA, 2013)
    - An integrating concept of a **multitude of literacies** essential for coping successfully with digital society (Martin&Madigan, 2006)
    - Digital competence – **critical thinking**, **problem-solving abilities**, understanding of **appropriate using of ICT**
    - a **condition**, not a threshold (Martin&Madigan, 2006)

Information and Digital Literacy

- Information literacy
  - adoption of appropriate information **behavior** to **obtain**, through whatever channel or medium, **information** well fitted to **information needs**, with **critical** awareness of importance of **wise and ethical use of information** in society
  - in accordance with **information-literate surroundings** (Webber&Johnston, 2004)

Measuring I&D Literacy

- Hard to define information & digitally literate member of society:
  - ever-changing learning, working and social context
  - disruptive technological innovations
  - big digital divide between school, home and the workplace
  - discord between learning experiences in divers environments
  - hard to correlate I&D literacy habits for personal lives with instructional practice in formal learning settings
  - Distinction between **formal** and **informal** (personal) approaches to informational barriers (Huvila, 2012):
    - Formal – *information services* as formal settings within libraries
    - Informal – *digital literacy* – personal intent to overcome the knowledge barriers independently

NTC for CE of Librarians

- National Training Centre for Continuing Education for Librarians in Croatia
  - founded in 2002 by four project partners:
    - National and University Library, Zagreb,
    - Zagreb Public Library,
    - Croatian Library Association, and
    - Library school at University of Zagreb
  - part of the international network of national centres for continuing education for librarians in Eastern Europe and Central Asia
  - providing a lifelong learning program after the initially acquired academic diploma in LIS
    - Non-compulsory & CEU credit one-day courses
    - +350 hours/year
    - traditional learning methods (f2f) + 3 online courses (Moodle)
    - +1500 participants/year
    - +60 courses/year

Former Learning Portal

- presented information about course description and learning objectives, incoming courses, etc.

- built in static HTML pages

- hard to maintain

- did not provide any social or semantic web functionalities

New Learning Portal

- aim to build a new learning portal for CPD on open platform to enable:
    - a greater learning experience,
    - foster social participation and collaboration in learning process,
    - facilitate learning content sharing and reuse,
    - provide personalized portal interface,
    - real-time event management, and
    - open integration and interoperability with learning systems.

http://cssu.nsk.hr

- WordPress open CMS – easy to maintain
- personalized portal interface,
- real-time event management,
- real-time poll's results
- RSS syndication
- e-newsletter

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- iCal and Google Calendar functionalities
- online reservation
- open education repository

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- social participation and collaboration,
- content sharing and reuse
- easy commenting and rating of courses

Experience API (xAPI)

- To overcome the assessment limitations specific to the informal and non-formal learning environment, an Experience API standard was tested as a digitally-incentive assessment to measure information and digital engagements of the portal users

- xAPI
  - ADL standard that operates based on tracking activity streams, officially released on April 2013
  - evolved version of SCORM standard for web-based e-learning and not limited to a particular eLearning course our LMS
  - uses software to track and record things people do in the form of triplets (Actor-Verb-Object)
    - Idea of tracking activity streams emerged from social networking (Facebook Open Graph, Twitter, Mozilla OpenBadges ...)
  - enables learning content and learning systems to communicate in a manner that records and tracks all types of learning experiences

Research methodology
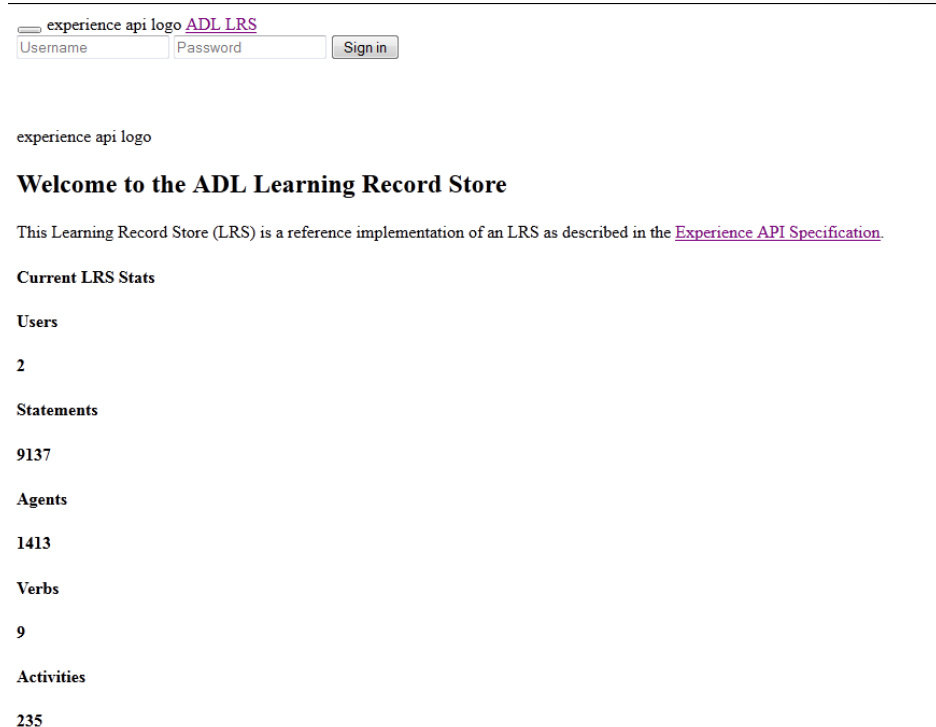
- **Experience API** standard and Learning Record Store (LRS) were tested to analyze the scope of user information and digital competences

- **LRS** is a type of data store that acts a repository for learning records and is necessary for using xAPI.

- xAPI assumes that all statements stored in LRS are defined in triplets:

<p align="center">learner-verb-object</p>

- In our example, we could expect the following learning statements:
  - *user1 posts a comment*
  - *user2 makes an online registration to the course 101*
  - *user3 rates the course*
  - *user4 edits his user profile …*

Research methodology

- Learning record store has been implemented http://lrs.nsk.hr:8000
  - To overcome the use of a commercial WordPress xAPI plugin, decision was to use **user activity log file** recorded through learning portal during a **three-month period** and to **transfer it into LRS** into the form of **learning experience statements**

experience api logo ADL LRS
Username   Password   Sign in

experience api logo

Welcome to the ADL Learning Record Store

This Learning Record Store (LRS) is a reference implementation of an LRS as described in the Experience API Specification.

Current LRS Stats

Users

2

Statements

9137

Agents

1413

Verbs

9

Activities

235

Research methodology

- While parsing log files, user activities were grouped in **Helsper&Eynon four types of skills** (critical, creative, social and technical), which authors discerned as the most common types of skills correlated with digital inclusion and engagement with ICTs

- To form learning experience statements from user log file an ADL xAPI Vocaburay was used (http://adlnet.gov/exapi/verbs/)

Critical	Creative	Social	Technical
Answered Scored Mastered	Imported	Registered Attended	Attempted Lauched

Findings

- While excluding web crawlers data from raw log files, to LRS was transferred in total 8902 semantic learning statements, created by 1412 unique users (users with unique IP addresses)
- A statistical analysis is carried out in R-Studio statistical environment
  - calculating mean,
  - standard deviation, and
  - correlation between four type of skills (critical, creative, social and technical)
- Statistical mean of observed data is 6.27, meaning that every user counted an average of 6.27 digital activities throughout the open learning portal

Findings

- Findings revealed that most user activities fall highly in the critical skills category (N=6398, 72%), followed by technical (N=1241, 14%), creative skills (N=793, 9%) with social skills (N=470, 5%) at the bottom.

- Users engaged most in mastering content, attempted actions, importing data, answering, registering, attending, launching and scoring.

Type of skills	Critical			Creative	Social		Technical		Total
Verbs	Answered	Scored	Mastered	Import	Registered	Attended	Attempted	Launched	
No.	349	2	6047	793	315	155	1108	133	8902
%	3.92	0.02	67.92	8.90	3.53	1.74	12.44	1.49	100
Mean	0.24	0.001	4.28	0.56	0.22	0.10	0.78	0.09	6.27
Total	6398			793	470		1241		8902

Table 1. Number of statements distributed on four types of skills by particular verbs.

Findings

- Statistical correlation analysis is used to identify and to measure the dependency among given set of data, ie. given type of skills.

  - **Social skills** are **highly correlated** with all types of **critical skills**
  - **Technical skills**, the same as **creative skills**, have **the lowest dependency** with other types of skills
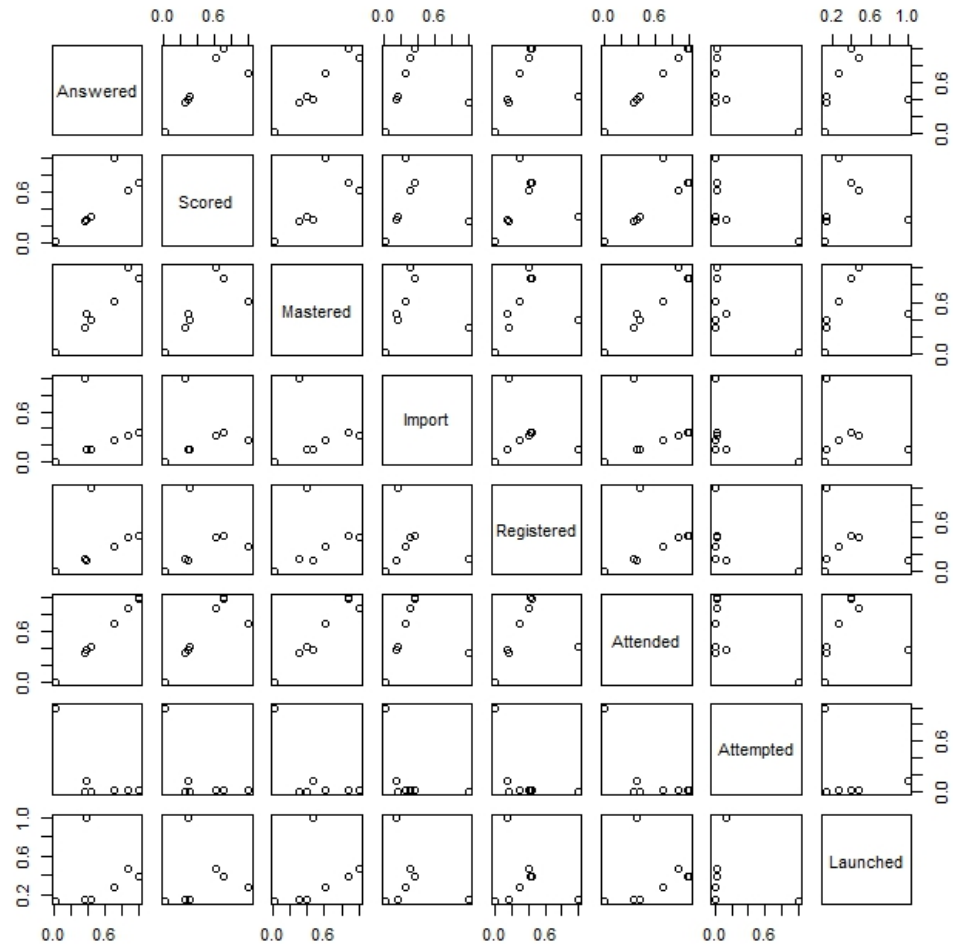
Conclusion

- Librarians engage regularly in an open learning portal
- Information and digital literacy consisted of both cognitive and technical proficiencies
- As critical and technical skill sets scored the highest means, librarians' engagement could be characterized as part of more knowledge consumption than knowledge creation domain.
- Technology skills are been used independently of other type of skills
- Full implementation of xAPI standard would provide detail users' category analysis
- xAPI would be suitable for:
  - information and digital literacy tool that will measure and express critical, creative, social and technical proficiencies equally,
  - for creation of personal learning record and self-evaluation

Application

- xAPI personal learning record integrated in the users' profile page indicating level of engaged critical, creative, social and technical skills

Thank you for your attention!

dmachala@nsk.hr