Acknowledgements

The project team would like to acknowledge the contribution of Dr Lyndsay Agans to the conception of this project. We would like to thank Professor Marnie Hughes-Warrington, Sean Downes, Roxanne Missingham and Lyn Stevens for supporting the team throughout the project.
List of acronyms used

ANU – The Australian National University
OLT – Office for Learning and Teaching
MOOC – massive open online course
Executive summary

INSIGNIA project set out to explore the possible use of digital badges in research education through a small trial of digital badges within a single institution – The Australian National University. A badge is like a digital certificate with a rich array of data describing what was involved in gaining this certification. It is also portable: once granted, the user can display it in a portfolio, social media profile, or website as evidence. Badges are also often used as a guide to learners to show what skills are required, or as motivation to complete additional training to receive the badges.

Project activities

ANU stakeholder engagement: Interviews were conducted with representatives from the following units: ANU Online, Marketing, Alumni Relations, Academic Skills and Learning Centre, Library, and Legal.

Engagement with badging community in Australia and internationally: The project hosted events on 21-22 March 2014 and 8 August 2014 which were attended by colleagues from University of Canberra (UC), Canberra Institute of Technology (CIT), Australian Catholic University (ACU), Australian Defence Force Academy (ADFA) and University of Wollongong (UOW) and Arup Engineering to discuss the use of digital badges in higher education in Australia. The project team also networked with badging leaders from Deakin University throughout 2014, and invited Dan Hickey from Indiana University as a badges expert. Members of the project team also attended a digital badging event at the University of Wollongong (2 Sept 2014).

Investigation of badge implementation options: Finding a method of delivering badges that could be implemented within the 1-year timeframe of the project, and within the legal and privacy requirements of the institution proved a major challenge (see more details below). After significant consultation, the third-party commercial service Credly was used for the purposes of this pilot.

Designed, developed, and implemented a small badging ecosystem: This included five possible badges attached to online, self-paced modules on research integrity and information literacy. At the time of writing, 83 badges have been issued from these modules (primarily for the mandatory Research Integrity training course).

Student engagement and feedback: A focus group was held with research students on 14 July 2014 on the potential uses and values of badges to inform the project design. Additionally, all students who chose to receive a badge were asked to complete a user engagement survey. Analytics on the badge usage has also been collected from Wattle and Credly.

Dissemination of results: Papers discussing this project were presented at the ASCILITE conference in Dunedin, New Zealand (24 Nov 2014), ALIA conference in Sydney (3 Feb 2015), and ICDDET conference in Oxford (30 March 2015). The ASCILITE paper, “Badge Trouble” won the conference award for Best Concise Paper. Forthcoming paper on Badges as part of a higher education economy has been accepted at the forthcoming Quality in Post Graduate Education conference.
Project Impact

This project produced a deeper understanding of the issues surrounding implementation of digital badges in complex institutional settings. An analysis of the administrative and legal issues in the implementation of badges is documented in the paper and findings are further developed in the paper “Badge trouble: piloting digital badges at The Australian National University” (see Appendix E).

Several new modules on digital and information literacy skills were created for early stage research students, and are available through the ANU learning management system. The course and the badges are being assessed as a model for further online development for the ANU information literacies program.

For the first time digital badges were trialled within the standard progress reporting procedures and shown to be a viable alternative to standard tracking paperwork. Implementation of digital badges as a token of completion enabled students to have a transportable credential. The digital badge could be used to demonstrate knowledge of the rules (and competency in interpreting them) to supervisors, faculty and various ethics committees.

This project was the first attempt to use digital badges for research supervisor professional development. In 2015 we commenced the last stage of the project - the implementation of badges to support online supervisor training in a massive open online course setting. The badges for the MOOC were completed and made live in August 2015 (this happened after scheduled project end date as the MOOC itself was delayed by some months).

Recommendations

• Significant interest in digital badges for research education was noted across the university and the ACT and Australia more broadly, but more work needs to be done to establish badges as a credible alternative to conventional accreditation forms (testamurs and transcripts). In particular, systems of quality assurance need to be adapted by universities so the value proposition of each institutional badge can be maintained.
• Badges are most useful when delivered through existing university systems. Due to time constraints, this project had to rely on a commercial, third-party service which made them seem less “official” to ANU students. A recognisably ANU-branded portfolio or backpack space is also key to giving badges official status as a university credential.
• The process for implementing new learning technologies is not sufficiently agile to be responsive to innovation and changes in the sector. Existing legal and administrative processes are geared towards a paper-credentialing model and are not easily adapted to technological change.
• There are competing frameworks within the university between the desire for open access / public engagement and a closed, private system. These tensions have to be resolved on a case-by-case basis, but academic and professional staff need to be equipped with the appropriate technical knowledge to do so and there is not widespread professional development resources to achieve this.
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Project overview

Context
This project explored the use of digital badges in research education. A digital badge is a type of micro-credential, which can be used to represent learning or achievements undertaken by students. A badge is an image file with metadata “baked” into it that gives information about the skill or achievement it represents.

A badge is like a digital certificate with a rich array of data describing what was involved in gaining this certification. It is also portable: once granted, the user can display it in a portfolio, social media profile, or website as evidence. Badges are also often used as a guide to learners to show what skills are required, or as motivation to complete additional training to receive the badges.

Methodology
The INSIGNIA project aimed to build and test a range of open badges and had the following explicit aims:

1. What are the affordances and barriers to the scalability of an open badging system such as INSIGNIA?
2. What sort of user design methodologies are needed to make open badge tasks legible and useful?
3. What additional skills and resources might an institution need to produce and integrate open badges in research education?
4. What are the cost and benefit implications to candidates, supervisors and institutions?

We used an action research framework as outlined by Mills (2000). We collected four different kinds of data: 1) Analytics (how many badges were downloaded and by whom?); 2) A user acceptance survey (offered to people who downloaded the research integrity badges); 3) A focus group with students, supervisors and librarians to explore attitudes to badges; 4) Interviews with key university stakeholders to explore barriers to implementation.

With the exception of stakeholder interviews, each kind of data was collected for the different sets of badges (see below) and used to inform then next iteration of badge development.

Approach
The team designed, created and implemented a series of badges for key aspects of the research student experience. The areas we targeted corresponded to all four key domains of the the Researcher Development Framework (RDF) created by the Vitae group in the UK1, a

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1 For more information about the RDF: https://www.vitae.ac.uk/researchers-professional-development/about-the-vitae-researcher-development-framework
well-respected and robust instrument\(^2\) for describing the skills and capabilities that need to be developed through a research degree. Badges were designed in conjunction with the ANU marketing team, who provided graphic design and the meta-data for each badge was crafted using a modified version of Kyle Bowen’s open badge anatomy\(^3\) which includes badge name, description, criteria, issuer, evidence, date issued and tags (since there are no published standards for PhD co-curricular activities, this was left out of our metadata list). Badges were distributed via the ‘Credly’ platform. In total, four different sets of badges were developed. A graphic of the ANU HDR badges is below:

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\(^2\) This framework was recently tested by Pitt and Mewburn (2016)

\(^3\) For more information, see [http://classhack.com/post/45364649211/open-badge-anatomy-updated](http://classhack.com/post/45364649211/open-badge-anatomy-updated)
The twelve badges were composed of four sets. We used our action research model to progressively refine the design and distribution methods. In chronological order the badge sets were:

- One badge targeting research integrity in the form of a single badge for completion of online research integrity training (Aligning with Domain C of the RDF: “research governance and organisation”)
- Four badges targeting digital literacy: “Library search strategies”, “Endnote: collect, curate and collate” and “increasing research impact” (this set of badges aligns with Domain A of the RDF “Knowledge and intellectual abilities”)
- Five badges for our Thesis Bootcamp program, a writing intensive designed to help end stage PhD candidates complete their PhD (aligned to domain B of the RDF “Personal effectiveness”).
- Two badges for social media skills and communication as part of the ‘How to Survive your PhD’ MOOC run in August, 2016 (aligned with domain D of the RDF “Engagement, influence and impact”)

Our action research framework applied to our initial badge development for the research integrity training badge provided important insights into candidate motivations, communication and graphic design issues. These insights were applied to our subsequent sets of badges and data collection and further data was collected, except for the last badge set (social media skills and communication). The digital badges created for this project can be viewed in Appendix B. The project blog contains summaries and work in progress as the project progress (see Appendix C). The project provided us with a set of data from which we produced the following scholarly outputs:

- “Badging the library: Are digital badges the next innovation for library skills and training?” ALIA Online 2015. Available: http://hdl.handle.net/1885/13234 See Appendix D
- “Why digital badges don’t work in research education (yet)”, ICDDET, Oxford, 2015 - slide deck and speaking notes.
- Open access white paper “Digital badges in research education” tabled for the ANU online education committee and made available to the sector for download.
- Paper “I don’t want something that my kid would bring home from the daycare centre: why badges don’t work for research education (yet), presented at the Quality in Post Graduate research conference, Adelaide, 2016.
- In August 2016 a paper developing concepts in the paper at QPR was just submitted to British Journal of Educational Technology and is currently under review.
- A paper reflecting on the use of badges in the ANUx MOOC has been submitted for review for inclusion in ASCILITE 2016.
Evaluation
The use of badges within a doctorate has the potential to make the learning journey more visible and legible to the candidate, and those tasked with overseeing their academic progress. Digital badges hold the potential to “visualise the learning path” (Ahn et. al., 2015) which is lacking for many students undertaking the PhD and can lead to high levels of anxiety in PhD student cohorts. In particular, the expectations with respect to the dissertation, the main assessable component of the PhD, are often not made explicit (Lovitts, 2007). By offering a reward for small and measurable achievements, digital badges could act as ‘waypoints’ in the doctoral learning landscape (Barnacle and Mewburn, 2010) and provide PhD students and their supervisors with a new way to benchmark progress, especially in co-curricular and enrichment activities. However this project brings into question the efficacy of using badges purely as motivators and way finding devices.

Digital badges have been used in a number of educational settings both formal and informal, but at time of writing the INSIGNIA project is the only case of an attempt to integrate digital badges in the PhD. Digital badges can be used as part of curriculum recognition, on particular to recognise professional development and co-curricular skills, as is the case in the majority of implementation cases to date (Bull, 2014). Co-curricular badges can provide students with rich evidence to employers of their participation in university programs, which is verified by the institution, and help communicate transferable skills outside of academia (Johnson et al, 2014). Students can display their badges as part of a professional portfolio or on a social network such as LinkedIn.

Our project provided some support to the idea that badges can be used in co-curricular areas, but the evidence is that research students are far more motivated to participate in badge activities if there is a clear incentive structure and the badges look ‘official’ and ‘credible’ (i.e.: reflect university branding regimes).

There was some confusion amongst our user group (research students, supervisors and administrators) about the nature and purpose of digital badges. Research students indicated that they were more interested in digital badges that represented the acquisition of ‘concrete’ skills, such as software competency, or as an alternate ‘official’ recognition of an activity that was already part of their degree. It is in these two areas where digital badges could be exploited further. Concerns were raised about the quality frameworks and whether the badges would ‘mean anything’ if they did not use the official logo of the university. It was clear that, if they were to have any credibility with our users, the badges would have to look - and act - as official parts of the conventional university degree awarding apparatus. Focus group participants expressed deep distrust at the ‘non papery-ness’ of badges. One participant even asked if they could have a piece of paper that went with the digital badge to ensure its authenticity and credibility.

Our research students’ focus group stated that they preferred to access many aspects of the library and training would need to include both searching skills, targeting research skills, library services as well as other relevant research sites such as the National Library of Australia, e.g. Trove. Other feedback included requests for training in the use of reference management software like EndNote as well as other software packages that support researchers. Lastly, they requested that the promotion of these courses be linked to stages in research, particularly in regard to the first two years of PhD training.
This research suggested that students were interested in recognition of ‘concrete’ skills and competencies, but their willingness to take part in this kind of training voluntarily has not been established. While only 5 candidates completed and downloaded full set Digital literacy badges, approximately half of the candidates who were eligible to get the research integrity training course (130) downloaded the badge. This was an interesting result which brings into question the data sourced from our focus group. The digital literacy course was designed to target concrete skills, but it was a non-compulsory course where the digital badge served no real purpose other than as a trophy. This contrasts with the research integrity course, where a clear use case was presented. Participants in the research integrity training course were informed that the digital badge would be accepted as back up evidence for completion of the course (a compulsory requirement for all PhD students to complete before graduation). We believe the reason for this was that the badge was clearly and unambiguously embedded in the official research degree progress reporting mechanisms, whereas the digital literacy courses offered by the library were not mandatory. This indicates that badges implemented within existing processes of recognition are likely to be more successful than badges that are offered for co-curricular activities. In the ANU higher degree by research training context this indicates a place for digital badges for:

- Fieldwork training
- Lab safety and occupational health training
- Confirmation of candidature
- Yearly progress reporting
- Submission and examination

**Disciplinary and inter-disciplinary linkages**

This project, by its very nature, was already interdisciplinary as we were dealing with supporting research students in all disciplines within the ANU. The most significant engagement across borders was with the various stakeholders with ANU, specifically:

- Legal
- ANU Online
- Marketing
- Alumni relations
- Colleges and schools
- Research skills and training
- The university library

The key insight from this stakeholder engagement process was that the implementation of digital badges is far more than a pedagogical problem.

All stakeholders had some investment in the look, composition or deployment of badges within ANU, in particular:

- ANU Online: responsibility for the learning management system and processes.
- Legal: responsibility for ensuring ANU complies with its legal obligations.
- Marketing: responsibility for university branding and the badge appearance.
- Library and Research skills and Training: badges activities (in consultation with the
As the stakeholder audit above indicates, the implementation of digital badges involves alignment between multiple stakeholders. These stakeholders have different responsibilities, which are sometimes in tension with each other. None of the previous literature on digital badges has dealt in detail with these institutional tensions and therefore our documentation of this case is a significant finding of the project. Further discussion of these issues can be assessed in our paper: “Badge trouble: piloting digital badges at The Australian National University” (see Appendix E).

Success factors and barriers to implementation

This project demonstrated that although technical implementation of digital badges is a relatively straightforward, issuing them through and with university systems and processes is far from simple. Badges have been acknowledged as a disruptive technology (Carlson & Blumenstyk, 2012). It is important to understand the nature of this disruption: in particular, the barriers to implementation that might be invisible until approached. These barriers might not be the result of deep-seated attitudes or a lack of willingness of individuals to change. Technology is often labelled as ‘disruptive’, but little concerted effort is made to understand the precise nature of this disruption and how it can be overcome. Accordingly, this project documented what trouble this disruptive technology caused, and how to overcome it, as a test case for others who might contemplate a similar project. The technical implementation of the badges would have been relatively straightforward, but the administrative and legal apparatus that surrounds this kind of implementation is not agile enough to allow fast and simple systems to be built. Support from university management was crucial to the success of the project to manage the ‘disruptive’ nature of the technology.

A short extract from our case study demonstrates both the success factors and barriers to project success. For example, our existing Moodle implementation does not have the badge capability turned on. The process to request and implement this change would have taken approximately 2 years to complete – well outside of the lifespan of the project. The ANU DVC-Academic approved the use of a third party service, Credly.com, to issue INSIGNIA badges. This involved students leaving our Moodle platform and making an account at Credly.com in order to download the badges, but there were further complications. Consultation with the various stakeholders included the legal department, who indicated that the implementation of badges in Moodle held the risk of contravening the Privacy Act (1988, Cth) because it ‘packaged’ the students email address within the badge itself. For a time the project was at risk.

The legal conundrum was solved by the constraints put on us by the ethics committee which determined that participation in badge activities must be voluntary. To consent, students had to leave the Moodle platform and create their own account on Credly, which satisfied the conditions of the Privacy Act.

This ‘work around’ was not an ideal solution and would not be appropriate in most pedagogical settings. There is no doubt that these extra ‘hurdles’ affected the participation rate and caused concerns amongst the participants. This is evidenced by responses gathered as part of our user acceptance survey: “I probably won’t sign up for this badge because I’ve...”

...
no idea what Credly is nor of its formal relationship with the ANU “; another remarked: “I would like to know how to delete my Credly account if I decide that I don’t like the service.”

As these students indicated, as the project was forced to use an external badging tool, the value of these badges as representations of ANU credentials was compromised. Key to the future success of badges would be to have not only ANU-branded badges given within ANU systems, but to have an official, branded portfolio or backpack space to display the badges. Education around the value and uses of badges for students (as well as staff and employers) and linkages to existing formal processes of recognition will be an important part of scaling up a badge project.

How digital badges might be implemented in other research degree programs
There is clearly potential to provide research degree students with other badges within the ANU research degree progress reporting framework. Our project tested this within the research integrity part of the progress reporting framework.

All university researchers in Australia have to comply with the National Statement on Ethical Conduct in Human Research. The compliance regime includes assurance that all research students are adequately trained on the complex legal and ethical responsibilities which surround research work. An online course with quiz-based assessment has been developed to fill this need. On successful completion of the quiz, and after reading a legal disclaimer with the relevant privacy information, the students were offered a chance to download the badge by going to the Credly site.

The most difficult aspect of scaling up this kind of activity would be to automate the granting of badges. Most, but not all, of these systems are already digital, but our institutional databases do not have capacity to issue badges, or allow them to be shared amongst the key stakeholders. A range of middleware would have to be written to enable this process, as well as an official, institutionally owned placed to display the badges (such as an ePortfolio).

Digital Badges as recognition of co-curricular activities
Research student feedback suggested that the library would be a good place to implement badges that represent ‘concrete’ learning achievements, rather than ‘soft skills’. As libraries often stand outside of the core curriculum, they would seem a natural place to test a micro-credentialing system without interfering with existing course and credit requirements. For research students, library skills training has been an important link to student outcomes in relation to early research skills training, in particular for learning to do literature reviews (Warburton & Macauley, 2014). Additionally, international students indicated a need for verified evidence of their research skills that could be shown to employers overseas. It is advantageous to students and future employers for students to be able to provide verified evidence of their specific skills, gathered as part of their co-curricular training in addition to the research degree (Group of Eight, 2013).

Three new library modules with associated badges were built in response to this feedback: Search skills and strategies, EndNote: collect, curate, create, and Increasing research impact were developed for new graduate students enrolled in early 2015. It remains to be seen if
voluntary co-curricular badges will be successful - intrinsic motivation may not be sufficient reason for research students to engage with digital badge activities. Promotion of these courses to research students will be essential for the badge uptake to be measured effectively. Furthermore, embedding library skills courses into core curricular courses would greatly improve the badge value (though this was outside the scope of this pilot project).

This project time frame was extended additional implementation of digital badges, as part of an upcoming MOOC for research supervisors called ‘How to survive your PhD. Badges will be granted to participants in this course for completing certain course activities linked to reflection and application of theories in research education. This course went live in August 2015 and evaluation was performed in September, further research output was produced in May and August 2016.

### Connection with OLT projects and priorities

This project connects closely to the OLT project led by Deakin University, “Curate, credential and carry forward digital learning evidence”, which investigates the use of badges and portfolios for students to collect evidence of their learning.

Additionally, the OLT has higher degree by research pedagogy as a priority area for 2015/2016. While the structure of research degrees in Australia varies widely, most are relatively lightly populated with formal training opportunities.

On the face of it, digital badges seem to offer an authentic, evidence based alternative to progress reporting which has been shown to be problematic (Mewburn et al., 2013). Research training appears to be a ‘soft entry point’ for the introduction of technologies like badges. Further research could focus on:

- How systems of quality assurance could be adapted to ensure widespread adoption and implementation of digital badges.
- Development of badge design strategies, responsive to innovation and changes in the sector.
- Capacity building within the sector so that academic staff can better engage with badge creation and implementation.
- Further exploration of the use of ePortfolios and badges as a method of displaying co-curricular credentials in the PhD.
- Ensure there is institutional-level commitment to badge use, as without recognition as an official credential badges lose much of their value.

### Project impact

A series of project dissemination activities were undertaken by the project team. These were evaluated through stakeholder feedback collected after each workshop or event.

1) A lecture “Have learners gone feral?” was run on the 21st of March to inform the ANU community about the project and its aims. There were 49 people present at
the lecture, including some from the University of Canberra, ADFA and CIT. The lecture outline is here: [http://billboard.anu.edu.au/event_view.asp?id=107152](http://billboard.anu.edu.au/event_view.asp?id=107152).

2) Initial badge workshop was held on the 22nd of March with 15 participants from around ANU and observers from the University of Wollongong and Arups engineering. Stakeholder feedback indicated that these kinds of events were valuable to others developing digital badge activities.

3) A focus group for students and supervisors was held on the 14th of July to discuss design and implementation of badges for research students.

4) A workshop was hosted on 8th of August open to interested members of the ACT academic community to disseminate the findings of our project so far. 18 people attended from ANU, CIT, UC and ACU as well as industry observers, ARUP Engineering. All attendees presented their ongoing projects and listened to Kate Coleman from Deakin University present on the progress of the large OLT project on badges running at Deakin via Google hangout. Participant feedback indicated that there was willingness to form an ACT based community of practice around digital badge design and implementation.

5) Dan Hickey of Indiana University was invited to ANU on 10th of November and a small, invited workshop and dinner was held with participants from the ACT workshop held on 8th of August to further the discussions.

6) A paper “Badge trouble: piloting digital badges at The Australian National University”, was presented at ASCILITE (In Dunedin, November 2014). The paper won the award for Best Concise Paper for the conference.

7) The badge design won the “Mega Moodley” Award at Moodleposium for best use of an external tool or plugin. Canberra, November 2014.

8) A paper, “Badging the library: Are digital badges the next innovation for library skills and training?” was presented at ALIA Online conference in Sydney, February 2015.

9) A paper “Why digital badges don’t work in research education – yet” was presented at the ICDDET conference in Oxford, March 2015.

10) The project team has been invited to speak about this badges project at the upcoming MoodleMoot conference in Melbourne, 6-8 July 2015.

11) Paper “I don’t want something that my kid would bring home from the daycare centre: why badges don’t work for research education (yet), presented at the Quality in Post Graduate research conference, Adelaide, 2016.

12) In August 2016 a paper developing concepts in the paper at QPR was just submitted to British Journal of Educational Technology and is currently under review.
Appendix A

Certification by Deputy Vice-Chancellor (or equivalent)

I certify that all parts of the final report for this OLT grant provide an accurate representation of the implementation, impact and findings of the project, and that the report is of publishable quality.

Name: .......................................................... Date: 2045
References


Appendix B: Digital badges for Insignia project

**Research Integrity Training**
Eligible for students who complete a compulsory online training course in research integrity and ethics.

**Library Search Skills and Strategies**
Eligible for students who complete an online module on library search skills (such as topic analysis and keyword selection).

**Endnote: Collect, Curate, Create**
Eligible for students who complete an online module on using the Endnote reference management software.

**Increasing Research Impact**
Eligible for students who complete an online module on research impact (including citation analysis, scholar profiles, and data citations).

**Library Research Skills**
Eligible for students who have completed the above three library skills modules (Search Skills & Strategies, Endnote, and Increasing Research Impact).
The **Thesis Bootcamp badges** replicate the physical lego block toys handed out to candidates completing word targets and act as motivators for candidates participating online.

**ANUx MOOC badges**: for participation and completion of the ANUx MOOC ‘How to survive your PhD’.
Appendix C: Project Blog

The project blog, “Adventures in Badging”, can be found at https://adventuresinbadging.wordpress.com/

It contains updates from throughout the project, including conference reflections, papers published, and results from focus groups with students. It also includes images and descriptions of the badges created for the project (see Appendix B, above) and scholarly literature on open badges.

At the time of writing (20 April 2015), the blog has received more than 2,300 visitors and 27 comments.
Appendix D: ALIA Conference Paper


Abstract:

Libraries are frequently at the forefront of innovation and uniquely positioned to develop and deliver new technologies. This paper evaluates the benefits of one such innovation, digital badges. It will explore how badges can be applied in the library and higher education environment by examining the potential of badges to provide verified credentials to students for completing ‘soft skills’ programs, using a case study from The Australian National University. The paper will discuss the challenges involved in implementing a cohesive credential issuing system within a university and suggest areas for future investigation on digital credentials will be explored.

Available online: http://hdl.handle.net/1885/13234
Appendix E: ASCILITE Conference Paper


Abstract:

Despite calls for innovation in learning technologies, setting up new tools for learning at large institutions is an often difficult road. This paper will address the challenges involved in setting up a small pilot of open badges at The Australian National University (ANU). It will investigate the options available for trialing badges when system administrators are unable to support the endeavour, and discuss the university policies and government legislation which have impacted the use of badges at ANU. Drawing on actor-network theory, it examines the complex techno-social environment and power structures surrounding the piloting of new technologies. This paper will also provide suggestions for other institutions struggling with concerns relating to privacy, branding, and reliability of open badges and invite discussion on ways to move forward.

Available online: http://hdl.handle.net/1885/13233