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Assessing OER impact across varied organisations and learners: experiences from the "Bridge to Success" initiative

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Assessing OER impact across varied organisations and learners: Experiences from *Bridge to Success*

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Abstract

Strategic decision making around Open Educational Resources (OER) requires the collection and detailed analysis of how resources impact learning. Simultaneously, it is inherent in the concept of OER that resources are to be used in different contexts and in varied ways. Encouraging institutions to appropriate resources to their needs is important to the effective application of OER. A major challenge is to develop research practices that can effectively evaluate this heterogeneous usage and impact.

In this paper we consider experiences of assessing impact from *Bridge to Success*: an initiative in which online courses in mathematics and study skills, originally developed at the Open University UK, were remixed for a US audience and made available as OER. The released materials were subsequently used in more than 16 US-based institutions including colleges, universities, high schools, and projects to help the long-term unemployed. The materials were used in a variety of ways. In some cases, units of these open online courses were used as supplementary materials, whilst elsewhere the courses were used in drop-in labs and face-to-face sessions. In several contexts, the materials were provided to a cohort of students to help them prepare for formal assessments. In others, underachieving students were specifically targeted and advised to use the resources. This variety of pilot contexts provided a challenging dimension to understanding the value of the OER intervention to the learner.

Understanding use is seen as a key component in the further development of OER (Atkins, Seely Brown & Hammond, 2007). However approaches to this where institutions have been encouraged to contextualise materials to their own needs are currently limited. We explore different approaches to evaluating this type of impact across contexts. Analysing data on frequency and type of access, learning gains, institutional enrolment and persistence of students are critical areas for this type of research, and require an understanding of institutional and learner characteristics, in addition to the varied ways in which the materials are facilitated. Openness creates challenges for researchers to collect and link data about all kinds of use. For example, institutions collect information on enrolment, assessment and retention in different formats: this data can be sensitive or difficult to share. In addition, to truly understand impact, researchers need to be able to distinguish different forms of resource use and connect this to specific user groups.

The paper evaluates our experiences by defining the types of impact data required by a range of stakeholders, and the achievements and challenges in delivering this information as part of the *Bridge to Success* initiative. A wide range of quantitative and qualitative methods were used in researching the impact of the initiative, but limitations exist in our current ability to understand use and to link this to the requirements of the different contexts of use. Based on both the successes and failures we had in monitoring impact we outline suggested approaches towards an effective general model for assessing OER impact.

Keywords

OER; Impact; Evaluation; Assessment

Introduction

Researching the use of OER presents a difficult balancing act between maintaining "openness" of the material, providing the best experience for learners, and capturing useful data. The *Bridge to Success* project, a Next Generation Learning Challenge (NGLC) grant, was led by the Open University, UK (OU), partnering with the Massachusetts Institute of Technology, Anne Arundel Community College, and University of Maryland University College in the USA. The 18-month project re-versioned two OU introductory-level online courses aimed to help students transition into a college environment; as a large proportion of US students lack fundamental skills necessary for higher education study. During the first phase, partner institutions collaboratively revised a learning/personal development course (Learning to Learn: L2L) and a mathematics course (Succeed with Math: SWiM). These were released in autumn 2011 and spring 2012, respectively[1].

The second phase assessed the courses' use and impact. As OER, both L2L and SWiM are freely available via the OU's LabSpace platform, designed to facilitate the dissemination, and remixing, of OER. Two- and four-year colleges and universities, support centres, and training programmes took part in official pilots, and were offered a small financial incentive in return for feedback and structuring use of content around identified aims. The research team simultaneously collected data on use via LabSpace (e.g. student progress and user feedback), and through instructors and institutions participating in the pilots (e.g. demographics, students' test scores, and outcomes).

Defining Impact Data

Definitions of impact vary across initiatives and stakeholders (e.g. researchers, institutions, and funders). In *Bridge to Success*, impact on access, success, retention, completion, and enrolment were of particular interest. However, understanding these factors in the context in which the materials were being used was key: How were educators making use of the OER? Could metrics be effectively defined and comparable data collected around these pilot contexts? What qualitative data should be used to understand these contexts?

Pilot institutions wanted evidence that students benefited from the materials and were better prepared for college studies. The funder's evaluation process sought comparative data across initiatives, quantifying benefits for large numbers across institutions. Required metrics followed a standardised template and included numbers of participants and numbers of "low income" participants, as well as more complex concepts such as "mastery of deeper learning".

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[1] *http://bridge2success.aacc.edu/*

Even within the standard template concerns regarding definitions and their consistent application across pilots existed. "Low income" was interpreted through eligibility for *PELL* funding, to enable participation in college. Other forms of impact, such as "deeper learning", are difficult to define and quantify. In response to this particular challenge, the project team designed five questions for instructors focusing on the Hewlett definition of "deeper learning"[2]. Instructors completed an online questionnaire regarding the number of students that they considered had achieved these aspects of deeper learning. This satisfied the funder's requests, although it produced limited data on individual achievements, and was based on the interpretations of instructors.

Tracking Student Use and Impact of OER

Minimising the tension between ensuring materials are open and collecting meaningful impact data is a critical one for OER. Openness can lead to reduced information on the circumstances around resource use, making research more difficult than in a closed system (Thomas *et al.,* 2012). However, closely monitored pilots allowed instructor, student, and institution data to be collected. When introducing the materials, facilitators were asked to encourage students to create accounts in LabSpace, making use of identifiers for each pilot and facilitating cohort tracking. Students were subsequently encouraged to login each time they accessed the materials to benefit from the full functionality of the course (e.g. one could track and reflect on one's progress, and take part in quizzes).

In practice, as the pilots were performed under different circumstances with different levels of involvement of the project team, signup and login was not consistent. Consequently, tracking student progress was problematic. Access logs suggested that many learners in pilots did not use a single computer, or log in on all occasions. As an enforced login policy was at odds with an open approach, accurate tracking of individual users provided only a partial picture.

Finally, the need for more longitudinal study became clear when working to institutional calendars. Difficulties arose in trying to collect data during the timeframe of the project, during which many students did not complete their use of the materials, or complete assessments following the use of materials. While data on re-enrolment and future success were expected to play a major role in identifying impact, collecting these forms of data is challenging given the cycle of institutional data availability.

Intended and Actual Use of Materials

Balancing the intended use of OER with the actual use of the content can create complex data collection scenarios. *Bridge to Success* materials were originally conceptualised for learners to complete the entire course, or at least whole units, and the data collection mechanisms built into the materials were designed around this (e.g. pre- and post-course questionnaires and pre- and post-unit quizzes).

In practice, each pilot used the materials differently: independent online work, instructor-led face-to-face sessions, and instances where specific pages or activities from the materials were incorporated within existing materials. Whilst this was a positive result in highlighting the flexibility of the materials, more individualised strategies to understand impact were needed. Was it possible to generate meaningful evidence to show the impact of single activities taken from L2L or SWiM and used within a pre-existing course? Instructor feedback suggested that sections of the material had benefited students, but developing stronger evidence required detailed understanding of individual contexts of use.

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[2] *http://www.hewlett.org/programs/education-program/deeper-learning*

In several instances, efforts were made to combine data collection with useful activities for the learners. Surveys were developed that both engendered self-reflection and captured feedback. However, pre-surveys received markedly more uptake than post-surveys in both courses, as many would not reach a conclusive end to their usage. If they had, it was unclear how to identify this. Quizzes included at the beginning and end of each unit in the SWiM course, with identical types of questions, provided some useful data, as learners more often completed whole units. Whilst a positive impact was observed through increased scores, quizzes were optional, and results may be biased towards those who mastered the materials.

Gathering Institutional Data

Understanding OER impact is highly dependent on understanding the context of use, and pilots offered opportunities to obtain information about institutions. However, some were unable to provide relevant data, either due to the timeframe or data sensitivity. Institutions collect data in heterogeneous forms, through different processes, and are careful about sharing. For example the data may allow cross-institutional comparisons of retention and pass rates that some considered sensitive.

Implementing a pilot took three months on average. Assessing OER impact requires collaboration with each institution, ideally with a "lead-in" period to account for the multiple-level permissions to implement schemes and provide data to researchers. Engaging not only with instructors and administration, but also examining the feasibility of required metrics in advance can ensure data collection succeeds, and allows time for finding solutions or compromises.

Bridge to Success revealed the need for initial and on-going negotiation with institutions over the availability of information. Moreover, as data collection occurred both via the LabSpace platform and through institutions, an additional need to match up student data from both sources was identified. This was a far more complex task than anticipated. Future projects should look closely at creating standards and assessing the potential for linking with institutional data in advance. However this ideal is in conflict with the flexibility that OER offer.

A General Model for OER Impact Research

With OER by its very "openness" being unpredictable in use, a model for research needs to be flexible and attentive to diversity. It should focus on achieving results based on definable quantities, but with a detailed understanding of the distinctions between contexts of use. In figure 1 we present a preliminary model of this process, representing the ideal connections between impact definitions and data collection.

Impacts such as retention, completion, and future success require longitudinal study, together with mechanisms to gather data on pre- and post-use. However, project constraints can make this difficult. An alternative is to compare those working with materials with non-users within the same institutional setting. Regardless of approach, OER projects assessing impact must address any instructor or institutional burden by ensuring integration with institutional assessment processes. OER projects of this type should also aim to support anonymous data sharing regarding students' prior experiences and assessments, so that a richer understanding is possible.

Figure 1. Preliminary Model of OER Impact Evaluation
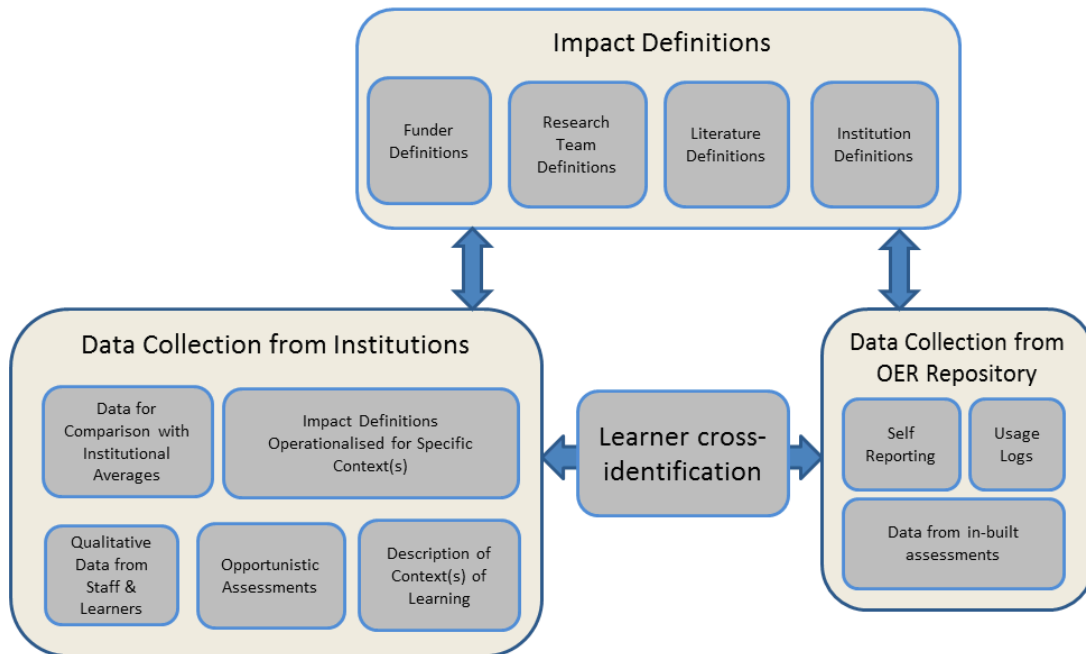
Ideally, institutions would pilot OER as they were conceived, supporting comparison and avoiding questions regarding the impact of small sections. In reality, however, it is clear that one of the strengths of OER is the ability to reuse materials in different ways, and researchers must be sensitive to this.

In-built assessments can be a less time-intensive way to collect data. *Bridge to Success* materials have been revised to contain assessable badges which motivate the learners in completing tasks, while tracking progress. However, there is also a danger of assessment fatigue. The balance between data collection and ensuring students have the most beneficial experience of open education is a delicate one. The use of badges has potential to extend available data, but further technical and methodological work is needed.

The same tension is apparent in relation to understanding the learner: How can researchers of OER impact understand a learner's context and intentions without arduous sign-up/login procedures, particularly when material is totally "in the wild" rather than in a well-controlled setting?

Conclusions

Previous research has presented evidence that the use of open materials can benefit students in individual contexts (e.g. Lovett, Meyer & Thile, 2008). However, broader research 'in the wild' often results in more opportunistic approaches to gathering data, which can be difficult to link to defined metrics. For example, in *Bridge to Success* there were cases where pre- and post-assessments occurred naturally in short time periods, as learners who had failed an examination were then encouraged to use the materials to prepare for a retake. Whilst this provided interesting evidence, it is clear that institutions and funders desire more consistent forms of impact data across large, diverse populations.

An effective, general model for assessing OER impact needs to satisfy a wide range of stakeholders by providing detailed data through metrics, whilst adequately capturing qualitative data which often forms compelling evidence for OER transforming lives on an individual basis. *Bridge to Success* sharply brought into focus the challenges of data collection in diverse use contexts, and the limitations of pre-existing methods. Our experience makes us aware of both the ideals of longitudinal studies linked to institutional data, and the challenges in practice. Those challenges may be mitigated by additional feedback from those involved and greater visibility of actions within the courses. However, the mismatch between openness and control is a fundamental one that needs to be recognised by all involved.

Acknowledgements

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