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SEARCHING AND LOCATING OER: BARRIERS TO THE WIDER ADOPTION OF OER FOR TEACHING IN ASIA

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Abstract

Open Educational Resources (OER) are fast becoming a global phenomenon which could potentially provide free access to knowledge for the masses. Since the inception of this concept, governmental and non-governmental grants alongside generous philanthropy have given rise to a vast array of OER repositories all over the world. With this movement gaining momentum, more and more of the learned community have started contributing resources to these OER repositories making them grow exponentially rich in knowledge. However, despite the availability of a large number of OER repositories, the use and re-use of OER are yet to become mainstream in many regions and institutions. One reason for this slow uptake is the inability to effectively search and locate desirable OER using the available search methodologies as it would be next to impossible to trawl through all the disconnected and disparate repositories manually. The findings discussed in this paper are part of a broader study into the OER landscape in the Asian region concentrating mainly on China, Hong Kong, India, Indonesia, Japan, South Korea, Malaysia, Philippines and Vietnam where close to five hundred and eighty academics from public, private not-for-profit and private for-profit institutions participated. This research paper discusses how Asia fares with respect to searching and locating desirable OER and whether it is truly a barrier to the wider adoption of OER for teaching in the region.

Keywords: Desirability of OER, Open Educational Resources, OER, Searching and Locating OER, OER in Asia, Barriers to OER.

1 Background

The Open Educational Resources (OER) movement has gained much momentum recently as a relatively new global phenomenon which is capable of bridging the knowledge divide. With increased funding and advocacy by governmental and non-governmental organisations coupled with generous philanthropy, OER are fast becoming mainstream in many academic circles. However, even though the number of OER repositories has grown exponentially over the years, boasting rich archives of quality OER in various disciplines, the wider adoption of OER in teaching still remains low especially in the Asian region where the necessity for OER is much higher.

One limitation inhibiting the wider adoption of OER is the current inability to effectively search and locate relevant and usable OER from a diversity of sources (Yergler, 2010). This inability is further heightened by the disconnectedness and disparateness of the vast array of OER repositories currently available online as no single search engine is still able to locate resources from all the OER repositories (West and Victor, 2011). According to Dichev and Dicheva (2012) one of the major barriers to the use and re-use of OER is the difficulty of finding quality OER matching a specific context as it takes an amount of time comparable with creating one's own materials.

The most common method for searching and locating OER is to use generic search engines such as Google, Yahoo! or Bing. Even though this method is the most commonly used, it is not the most effective as discussed by Pirkkalainen and Pawlowski (2010) who argue that *"searching this way might be a long and painful process as most of the results are not usable for educational purposes"*. As possible alternatives to this method, many methods such as Social-Semantic Search (Piedra et al., 2010), DiscoverEd (Yergler, 2010) and OCW Finder (Shelton et al., 2010) have been introduced. However, Abeywardena, Raviraja and Tham (2012) state that despite all these initiatives there is still no generic methodology available at present to enable search mechanisms to autonomously gauge the *desirability* of an OER which is a function of (i) the level of openness; (ii) the level of access; and (iii) the relevance; of an OER for one's needs.

Knowing the issue of the inability to search and locate *desirable* OER, this research paper discusses how this inability is affecting the wider adoption of the use and re-use of OER in the Asian region and presents a set of recommendations which would improve the effectiveness of the search and location of specific, relevant and quality OER. The paper is structured into four key sections under the headings methodology, findings, discussion and recommendations.

2 Methodology

A regional group of researchers (collaborators) from China, Hong Kong, India, Indonesia, Japan, South Korea, Malaysia, Philippines and Vietnam, who are currently active in the OER arena, jointly developed a survey instrument consisting of seventy nine independent items which would be used to elicit an understanding of the OER landscape in the Asian region with respect to (i) the use of digital resources; (ii) the use of OER; and (iii) the understanding of copyright from both an individual as well as an institutional perspective. The survey was conducted using hardcopies and an online version over a period of twelve months by the collaborators where approximately five hundred and eighty responses were gathered from academics who has had some exposure to the concept of OER. The responses were then consolidated and split into two cohorts according to (i) individuals who have experience in OER; and (ii) competent authorities of institutions who can comment holistically on the institution's practice of OER. The resulting data was analysed using the open source statistical analysis software package PSPP and was published by Abeywardena and Dhanarajan (2012). The findings discussed in this research paper are part of the first cohort which concentrated on the individuals' perspective.

3 Findings

For the purposes of this particular research paper, the analysis of the data only concentrates on four hundred and twenty responses (N=420) from eleven countries which represent the various Asian regions as shown in Figure 1.

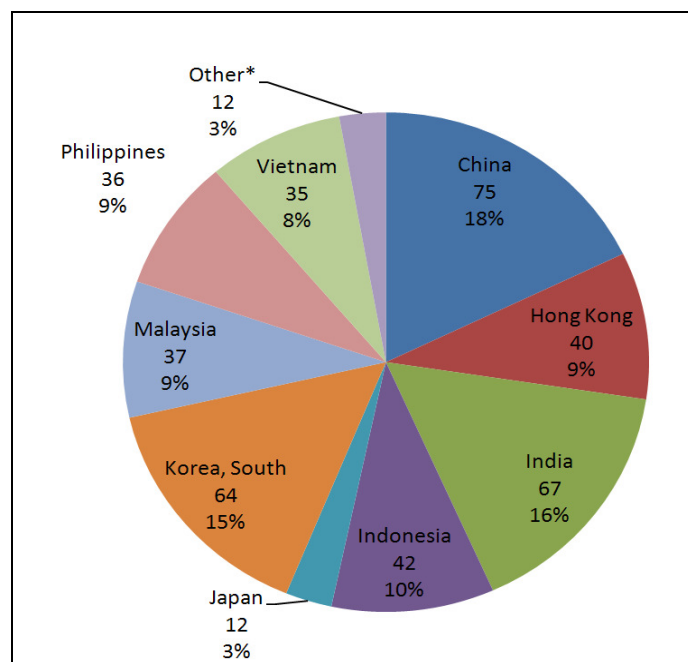


Figure 1 Participant profile

The cohort comprises of academics from 312 (74.30%) public, 63 (15%) private not-for-profit and 45 (10.7%) private for-profit institutions. The extent of the use of OER by the participants in their teaching is shown in Figure 2 and their attitudes towards using OER in their teaching are highlighted in Table 1.

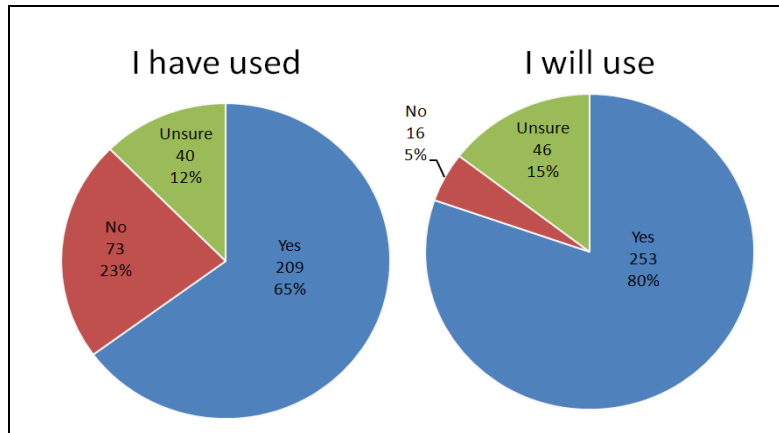


Figure 2 Use of OER in teaching

Table 1 Attitudes towards using OER in teaching

	Agree	Disagree	Neutral	N
Reusing OER is a useful way of developing new courses	77% (240)	3.5% (11)	19.5% (61)	100% (312)
Exploring the available OER worldwide will enhance my teaching and raise standards across the University	79.8% (249)	1.9% (6)	18.3% (57)	100% (312)

To understand the OER downloading habits of the participants, they were asked whether they predominantly download OER from OER repositories or whether they freely download them from the internet using search engines (Figure 3).

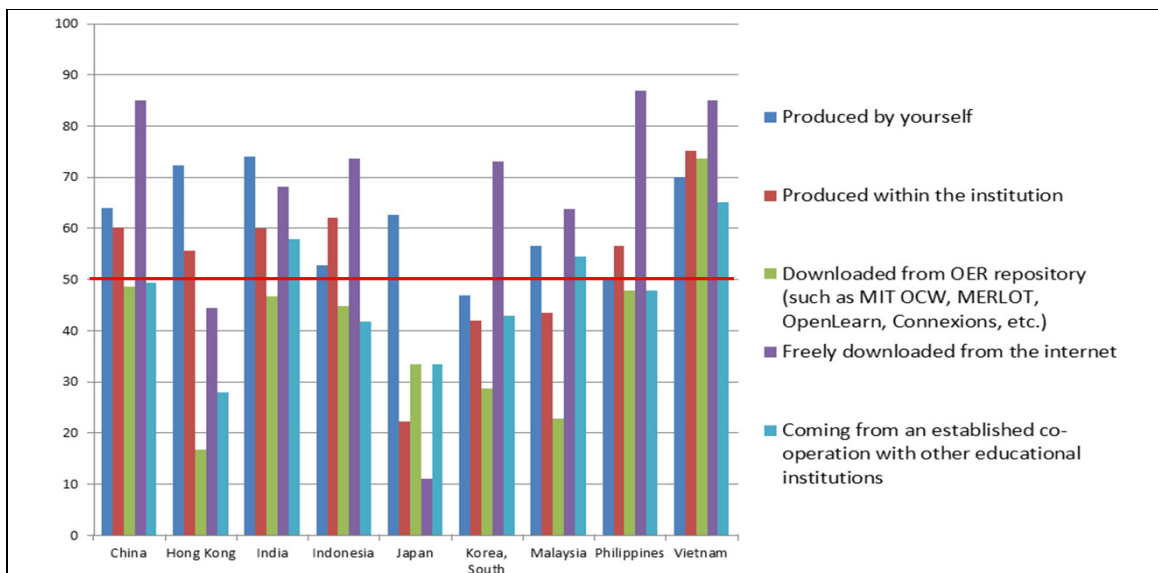


Figure 3 OER downloading habits

Table 2 shows the extent of use of the available search methodologies for locating OER according to the respondents who have used OER in their teaching before (Figure 2). This cohort also mentioned that they locate OER through other means such as by word of mouth from colleagues, through Wikipedia and through face-to-face networking in addition to the common methodologies mentioned in the survey instrument.

Table 2 Extent of use of available search methodologies for locating OER

	Use less	Use more	N
Generic search engines such as Google, Yahoo, Bing etc.	3.1% (6)	96.9% (189)	100% (195)
Specific search engines such as Google Scholar	31.1% (60)	68.9% (133)	100% (193)
Wikieducator Search facilities	51.8% (99)	48.2% (92)	100% (191)
Specific search facilities of OER repositories such as OCW, Connexions etc.	56.8% (108)	43.2% (82)	100% (190)
Any other methods for locating OER	66.7% (50)	33.3% (25)	100% (75)

When asked what barriers they consider to be significant to the use of OER, 64% of the participants who had used OER before in their teaching mentioned that the lack of awareness of the university OER repository and other OER repositories was a major barrier. 56.6% of the same cohort mentioned that the relevance of the available OER to their teaching is also one of the barriers for wider use of OER.

Table 3 shows how the participants felt with respect to the lack of ability to locate specific, relevant and quality OER for teaching. In this context (i) *specific* denotes the suitability of an OER for a particular teaching need. For example, an OER on physics from the final year syllabus of a physics degree would not be suitable for a high school physics class; (ii) *relevant* denotes the match between the content of the OER and the content needed for a particular teaching need. For example, physical chemistry is not relevant for a teaching need in organic chemistry; and (iii) *quality* denotes perceived academic standard of an OER for a particular teaching need.

Table 3 The importance of locating specific, relevant and quality OER for teaching

	Unimportant	Important	Neutral	N
Lack of ability to locate specific and relevant OER for my teaching	20.5% (63)	57.4% (176)	22.1% (68)	100% (307)
Lack of ability to locate quality OER for my teaching	13.8% (42)	67.6% (207)	18.6% (57)	100% (306)

4 Discussion

This research paper is underpinned by the hypothesis that the inability to effectively search and locate desirable OER using current technologies is posing a barrier to the adoption of OER for teaching in the Asian region. The nine countries identified in Figure 1 are representative of the majority of sub-regions in Asia (Table 4).

Table 4 Representation of Asian sub-regions

	Country	Region
01	China	East Asia
02	Japan	
03	Hong Kong	
04	South Korea	
05	Malaysia	South East Asia
06	Philippines	
07	Indonesia	
08	Vietnam	
09	India	South Asia

Out of the academics who had participated in the survey, 65% had used OER from other academics in their teaching and 80% mentioned that they will use OER in their teaching in the future. This shows that the use of OER is gaining popularity and wider acceptance in the Asian region. Additionally, referring to Table 1, the attitudes towards the use of OER is also taking a positive turn as 77% of the participants found OER to be a useful way of developing courses while 79.8% agreed that OER will improve the standard of their teaching. However, even though the use of OER and the attitudes towards it are improving, 57.4% of the academics found that the lack of ability to locate specific and relevant OER was an important inhibitor towards the use of OER. Furthermore, as shown in Table 3, 67.6% of the academics felt that the lack of ability to locate quality OER was also an issue worth consideration.

In order to identify the reason behind academics not being able to locate desirable OER for their teaching, the mode of searching and locating OER needs to be scrutinised. Looking at Figure 3, it is apparent that most of the time academics search and locate OER which are freely available on the internet as opposed to using specific OER repositories which maintain a certain level of quality. Furthermore, these repositories are equipped with native search mechanisms which facilitate the location of more specific and relevant OER for a particular teaching need. However, as shown in Table 2, only 43.2% of the academics use specific search facilities of OER repositories. Therefore, the lack of use of dedicated OER repositories and their tailored search mechanisms for locating OER has indeed become an inhibitor with respect to searching and location of specific, relevant and quality OER. 64% of the same cohort mentioned that the lack of awareness of the existence of such repositories was the key contributor to this current situation.

Looking at Table 2, it can be seen that generic search engines such as Google, Yahoo! and Bing are used almost all the time for searching and locating OER compared with the specific search mechanisms such as Google Scholar or the native search mechanisms of OER repositories. From this comparison, it is apparent that many academics depend on generic search mechanisms to locate the required OER for their teaching purposes. However, the inability of these generic mechanisms to locate desirable OER for a particular teaching need, as highlighted in literature, has in fact become an inhibitor to the wider adoption of OER for teaching in Asia.

5 Conclusions and Recommendations

Open Educational Resources (OER) are fast becoming a global movement which could potentially bridge the knowledge divide between the masses. Even though there are a large number of rich OER repositories located across the globe, the uptake with respect to use and re-use of OER in teaching has been slow due to a number of reasons. One such reason is the current inability to effectively search and locate specific, relevant and quality OER from the various disconnected and disparate OER repositories. With the rapid mushrooming of new OER repositories and the expansion of the existing, it has become highly infeasible to manually trawl each repository to identify OER required for specific teaching purposes. As such, this limitation has become an inhibitor to wider adoption of OER especially in the Asian region.

When considering the technological limitations, the inability of mainstream searching mechanisms, such as online search engines, to accurately distinguish between an OER and a non-OER material becomes a major hurdle. Although one might argue that the most popular search engines do provide the advanced facilities to define various filter criteria which would refine the searches, these search engines are not tailored to easily and effectively locate OER material which are the most suitable for a specific purpose. As such the OER consumers will need to resort to frequenting the more popular OER repositories such as Rice Connexions, MIT OCW or Wikieducator to search for the OER material they are after. However, this too has become a cumbersome and time consuming task as the number of repositories and the volume of each repository keeps on expanding. Thus it becomes an infeasible affair to keep track of all the OER repositories available. Also, users would be spending quite a number of hours on these popular but disconnected OER repositories conducting multiple searches using the native search mechanisms; and by so doing limit the scope as well as the variety of OER material available to them. Ultimately, even though many of these popular OER repositories hold a rich selection of material, the user is stuck in a scenario where the use of these materials is not a choice but a lack of options.

Another factor inhibiting the effective searching and location of specific, relevant and quality OER is the disparateness and disconnectedness of present day OER archives. Within the context of parametric web based searching mechanisms, the terms *specific*, *relevant* and *quality* denote key parameters which need to be considered seriously. *Specific* refers to the uniqueness of a piece of information which is returned as a result of an online search. This parameter is important with respect to ensuring that only a minimum number of instances of a piece of OER material are presented to the user. The term *relevant* refers to the standardisation of metadata which will facilitate more accurate searches. *Quality* stands for the desirability of OER material. As such, the disparateness and the disconnectedness of OER repositories can be broadly attributed to (i) the lack of adoption of a standardised method for defining metadata; (ii) the lack of a centralised search mechanism which will identify and locate OER from all of these disconnected repositories; and (iii) the inability to indicate the desirability of an OER returned as a search result.

Considering the lack of a standardised method for defining metadata for OER, it can be argued that the definition of metadata cannot be made one hundred percent accurate or uniform for all OER resources if done by the creator(s) of the resource. Therefore the use of human defined metadata in performing objective searches becomes subjective and inaccurate. A possible solution to overcome this inaccuracy and to ensure uniformity of metadata would be to utilise a computer based methodology which would consider the content, domain and locality of the OER material, among others, for autonomously defining uniform metadata.

The authors are currently involved in a pilot project named “OERScout” which uses artificial intelligence (AI) techniques combined with text mining algorithms to cluster OER from the various disconnected and disparate repositories by autonomously identifying keywords which best describe the content of the OER. This system looks at categorising all the OER from the repositories with an aim to providing accurate recommendations of desirable OER based on a particular curriculum provided by an academic.

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References

- Abeywardena, I. S., & Dhanarajan, G. (2012). OER in Asia Pacific: Trends and Issues. *Keynote address of the Policy Forum for Asia and the Pacific: Open Education Resources organised by UNESCO Bangkok and Commonwealth of Learning (COL), 23rd April 2012, Thailand*. Report available at <http://www.unescobkk.org/education/ict/online-resources/databases/ict-in-education-database/item/article/oer-in-asia-trends-and-issues/>
- Abeywardena, I.S., Raviraja, R., & Tham, C.Y. (2012). Conceptual Framework for Parametrically Measuring the Desirability of Open Educational Resources using D-index. *International Review of Research in Open and Distance Learning*, 13(2), 104-121
- Dichev, C., Dicheva, D. (2012). Open Educational Resources in Computer Science Teaching. *SIGCSE'11, February 29–March 3, 2012, Raleigh, NC, USA*. Retrieved December 25, 2011 from http://myweb.wssu.edu/dichevc/Research/SIGCSE2012_DichevDicheva.pdf.
- Piedra, N., Chicaiza, J., López, J., Tovar, E., Martinez, O. (2011). Finding OERs with Social-Semantic Search. *Proceedings: 2011 IEEE Global Engineering Education Conference (EDUCON), April 4 - 6, 2010, Amman, Jordan*. Retrieved December 25, 2011 from http://www.psut.edu.jo/sites/EDUCON/program/contribution1482_b.pdf.
- Pirkkalainen, H., Pawlowski, J. (2010). Open Educational Resources and Social Software in Global E-Learning Settings. In Yliluoma, P. (Ed.) *Sosiaalinen Verkko-opiminen*. IMDL, Naantali, 23–40.
- Shelton, B. E., Duffin, J., Wang, Y., Ball, J. (2010). Linking OpenCourseWares and Open Education Resources: Creating an Effective Search and Recommendation System. *Procedia Computer Science*, 1(2), 2865-2870.
- West, P., Victor, L. (2011). Background and action paper on OER. *Report prepared for The William and Flora Hewlett Foundation*. Retrieved December 25, 2011 from http://www.oerknowledgecloud.com/sites/oerknowledgecloud.com/files/Background_and_action_paper_on_OER.pdf.
- Yergler, N. R. (2010). Search and Discovery: OER's Open Loop. In *Open Ed 2010 Proceedings: Barcelona: UOC, OU, BYU*. Retrieved December 25, 2011 from <http://hdl.handle.net/10609/4852>.