CHAPTER

11

Experiences in Finding and Using OER in Teacher Education Programmes: Pedagogical Approach and Challenges

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Abstract

This chapter discusses the author's experience of using web resources — both open educational resources (OER) and non-OER — in undergraduate and graduate teacher education programmes. The focus is on the pedagogical and learning principles guiding the selection, sequencing and organisation of web resources in supporting programmes that use a blended learning approach. Specific examples are provided to illustrate how the pedagogical principles are applied in the use of web resources for supporting learning. Emphasis is on the changing role of teachers in higher education institutions, who will become content curators, and on engaging students in higher-order thinking. Finally, several challenges that may determine the future of using such resources for teaching and learning with OER and non-OER are discussed.

Keywords: *blended pedagogical approach, content aggregator, content curator, content selection, disruptive innovation, multimodality, non-OER, open educational resources (OER), self-instructional module, transference*

Introduction

The Web is the largest library on earth, offering a wealth of useful and accessible resources in a variety of disciplines and fields. It is estimated that there are over a trillion webpages and climbing (but no one really knows!). A unique feature of the Web is that anyone is able to design, create, publish and distribute materials on the Web in any format. The Web has revolutionised how information is accessed, making knowledge available to millions of people who would normally not have such access due to a lack of libraries and the costliness of textbooks and reference materials. Budget cuts in library expenditure in many colleges and universities have deprived students of badly needed educational resources. Ensuing deficits tend to be most acute in the developing economies, where it is not unusual for a tertiary student to share a hard-copy version of a required text with a hundred other course-mates.

Higher education teachers use the Web extensively for social and professional activities; unfortunately, many are rather reticent about the resources available on the Web for teaching and learning. It has been suggested that the Web is the most "disruptive innovation" in higher education, a term introduced by Christensen (2003) to describe a product or service which takes root initially in simple applications at the bottom of a market and then insistently moves "up market", eventually dislodging established rivals. Similarly, educational web resources, especially open access materials, initially may not be highly valued in higher education teaching for several reasons, one being perceptions regarding quality. But as the quality of these resources improves and quantity grows exponentially, open resources may eventually replace or at least modify existing pedagogical models and strategies in higher education. Wheeler (2010) argues that the enormity of accessible learning resources will eventually force academics to reinvent the way teaching–learning strategies are conceived and delivered in colleges and universities. Bill Gates, in a speech at a Techonomy conference in 2010, stated:

> Five years from now on the Web for free you'll be able to find the best lectures in the world.... It will be better than any single university ... the best lectures in the world will no longer be at hallowed institutions, reserved only for the privileged and elite, but on the Web for everyone who wants access to them. (Gates, 2010)

This challenges the long-held view that students enter colleges and universities to obtain knowledge locked in the minds of the world's academics and libraries. Learners are not necessarily concerned with where content comes from; they are more concerned with whether it is good (Spender & Stewart, 2002). Yet despite information being increasingly ubiquitous, higher education teachers continue to maintain their role as the source of all information. The knowledge transfer model fails to recognise that learners are growing up with computers, mobile phones, video games and the Internet. Rather than wait for an esteemed professor to tell them what to learn, these learners are finding out things on their own from the Web. Some academics, aware of the potential of digital educational resources, have made them available to learners any time, at any place, and in a form that is useful for them.

In the Organisation for Economic Cooperation Development (OECD) study, *Giving Knowledge for Free: The Emergence of Open Educational Resources* (2006), the majority of instructors in the 49 countries sampled had used open educational content to some extent in their teaching. They were using small chunks of courses rather than full courses. The reasons for using open content were to complement their own teaching–learning resources, to become independent of publishers, and to reduce the cost of developing learning materials. The study reiterated the need for more information regarding the users and uses of open resources.

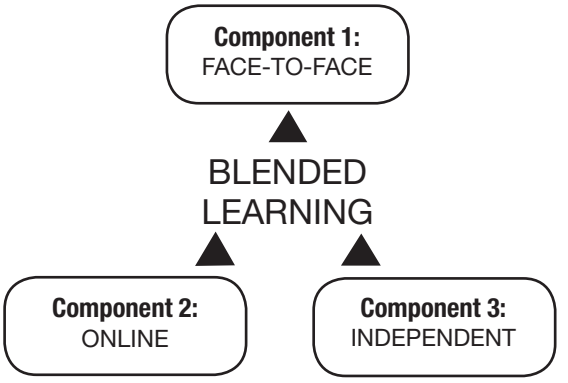
This chapter discusses how the School of Education and Cognitive Science at Asia e University (AeU) uses educational resources from the Web to provide a rich learning experience for students in teacher education programmes. Currently, the school offers the following programmes through distance learning: Bachelor of Education (Teaching English as a Second Language), Graduate Diploma in Early Childhood Education, Postgraduate Diploma in Higher Education Teaching, and Master of Education in ten areas of specialisation. Students in these programmes

are essentially working adults, ranging from 30 to 70 years of age and from varied backgrounds and experiences. Learners following these programmes are from Malaysia, Malawi, Kazakhstan, Singapore, Vietnam, India and Maldives.

Pedagogical Approach

The delivery of the four teacher education programmes at Asia e University adopts the blended pedagogical approach in meeting the needs of working adults and requirements stipulated by the Malaysian Qualifications Agency (MQA), responsible for accreditation of programmes. For example, in a three-credit course, learners are required to spend 120 learning hours over 14 weeks reading the learning materials, participating in face-to-face interactions, doing their assignments and projects, searching for materials and participating in online discussions. Figure 11.1 presents a summary of the three primary components of the blended or hybrid pedagogical approach that combines face-to-face learning with online offerings.

Figure 11.1: The blended pedagogical approach in the delivery of programmes



For Component 1, learners are provided with ten hours of face-to-face tutorials (18–22 learners per class), held during weekends (once a month) at a learning centre nearest to their residence. However, learners have the option not to attend these face-to-face tutorials and instead to pursue the programmes fully online. For Component 2, learners are encouraged to spend about 20 hours online, engaging in learning activities and problem-solving in online forums, chat rooms, blogs and wikis. The online interaction is facilitated by an online tutor who initiates learner–content interaction, learner–learner interaction and tutor–learner interaction. For Component 3, learners are involved in independent study supported with a comprehensive self-instructional module (SIM), which stipulates the "must-know" content learners are expected to master and apply. Learners are required to spend about 90 hours per course per semester reading the SIM, solving problems, doing assignments, watching video clips, listening to audio clips and preparing for an examination.

It has been the experience of the author that the greatest challenge in implementing the blended pedagogical approach at AeU has been the provision of high-quality learning materials. Not only are they expensive to produce, but there is also the difficulty of finding good writers with the relevant content knowledge to write such materials. To overcome these barriers and reduce reliance on publishers,

both open educational resources (OER) and non-open educational resources (non-OER) have been linked, adapted and adopted to provide a learning experience that allows self-paced learning in which learners have control over their learning time and pace. OER are digitised materials offered freely and openly for educators, students and self-learners to use and reuse for teaching, learning and research, and often carry a Creative Commons license (Speirs, 2006). OER also include works classified as "public domain" which can be used without permission because the copyright has expired and not been renewed, or works published in the United States before 1923, or works whose owner has indicated a desire to give them to the public without copyright protection. Some educational resources may neither carry a Creative Commons license nor be in the public domain, but their owners have allowed for the reprinting, distribution and storage of the original work. On the other hand, "non-OER", also commonly referred to as "stuff-on-the-Web", are those educational resources on the Web that cannot be reused, reversioned, stored or distributed because of copyright restrictions.

Fortunately, the Web is rich with educational resources for teacher education courses, and the majority are relevant and useful instructional materials. Nevertheless, these resources are painstakingly vetted by AeU subject-matter experts to determine accuracy, validity, relevancy and currency for use by students.

Whilst the quantity and quality of OER are increasing at a rapid rate, there are still areas in teacher education not adequately covered by open access materials. To make up for the shortfall in open OER for certain topics and subject areas, non-OER are used through hyperlinking; this is the practice of linking one webpage to another, with the linking word, phrase or image highlighted to serve as an "active" or "hot" zone on the page. The user gains immediate access to the linked page simply by clicking on the hot zone, eliminating the need to type in the full URL, since the hot zone replaces the underlying code. By and large, hyperlinking is not a breach of copyright; it is not tantamount to trademark infringement, commercial misappropriation, or defamation. According to Hofman, "linking does not involve unauthorised copying and it is hard to see how it infringes copyright" (2009, p. 67). Similarly, section 22(6) of the *Digital Agenda Act (2001)* in Australia states that, "in most cases of hyperlinking, the website developer will not currently be liable for infringement by authorisation" — i.e., hyperlinking will not normally infringe copyright except where the linked website itself contains infringing material. However, there have been several legal disputes on hyperlinking in the United States, Britain and Australia involving business organisations, especially in relation to the issue of "deep linking", where the home page or landing page of the linked website is bypassed (deep linking may affect the linked site's potential advertising revenue).

It is the author's practice to seek the consent of website owners. Oftentimes, owners are delighted to share their material because hyperlinking enhances traffic to their websites. In circumstances where either the owners are not contactable (because no email address was provided) or no response is received from them, the owner and origin of the website are acknowledged using the APA format. Every webpage is checked to determine whether its terms and conditions of usage allow hyperlinking. Every effort is made to ensure that for the hot zones,

plain-text names are used. Hot zones using the logo, slogan or trademark are avoided since these could lead viewers to conclude that the linked page endorses or is affiliated with the website. As far as possible, deep linking is avoided. A disclaimer is included stating that at the time the link was initially visited, it contained no offensive or hurtful materials, and that it should be understood that one does not have control of another's content, which may change after linking. The disclaimer also includes a statement that one is not responsible when the linked website contains infringing materials. Finally, each case of using copyrighted material is based on the four factors of the doctrine of fair use (U.S. Copyright Law – Section 107) which relates to the purpose and character of use, the nature of the copyrighted materials, the amount and substantiality of the portion taken, and the effect of the use upon the potential market (Stanford University, 2002).

Framework for Selection of Web Resources

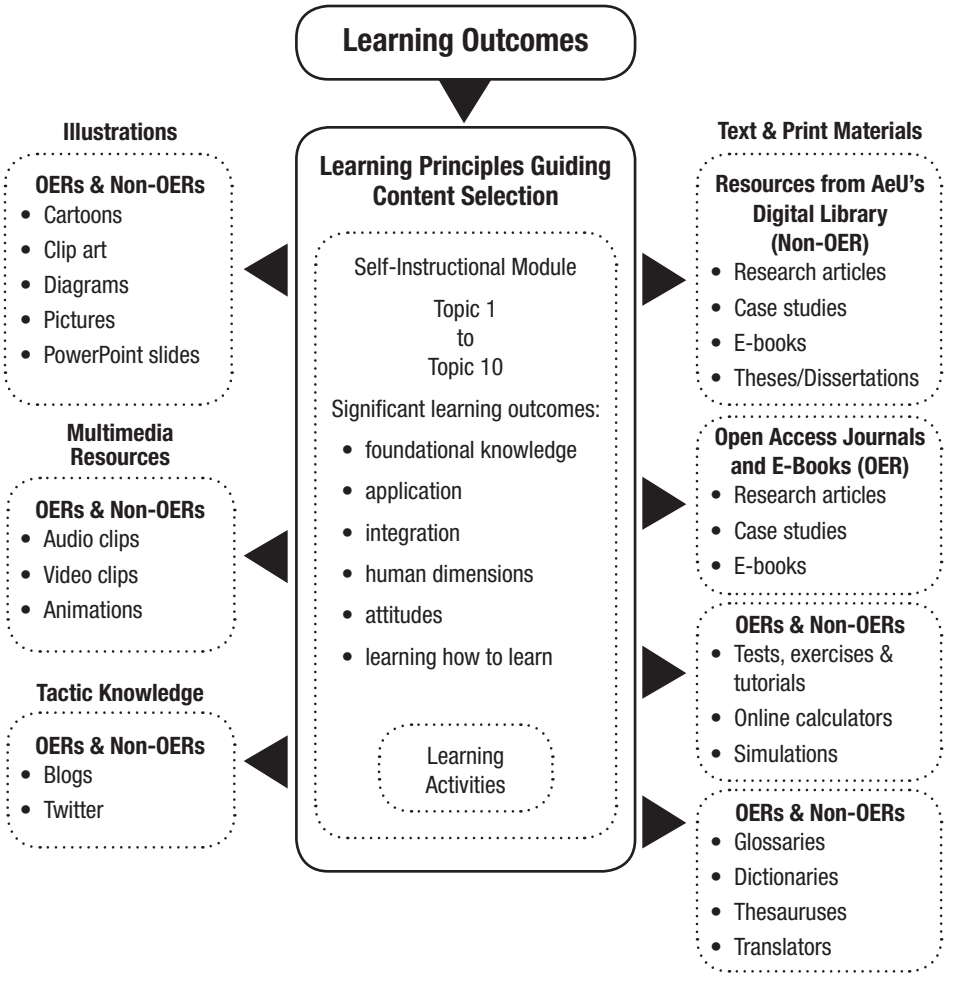
As mentioned earlier, the biggest challenge for successful implementation of the blended learning approach is Component 3 — providing learners with digital content that will enable them to learn independently, since face-to-face interaction is greatly reduced. The SIM provided for each subject or course, often described as a "tutorial-in-print", delimits the must-know content that learners are to master with minimal support from teachers (Rowntree, 1997). The design of the SIM takes into consideration that most learners pursuing the teacher education programmes are adults for whom English is a second language. Content is presented in short and manageable chunks using language that is sufficiently simple to keep learners engaged with the subject area. Whilst the language may be simple, the rigour of the concepts, principles, procedures and theories to be acquired is benchmarked against similar courses offered by well-known universities. Figure 11.2 provides a framework detailing the processes involved in Component 3 of the blended pedagogical approach, focusing on the selection and validation of web resources (both OER and non-OER) for a course or subject (Phillips, Kaur, & Ahmed, 2005).

The first process relates to the learning outcomes to be achieved in a course. Each course or subject consists of ten topics of content to be studied over a 14-week semester. Each topic consists of four to five learning outcomes, making a total of about 40 to 50 learning outcomes to be achieved in a course or subject. Learning outcomes are important because they determine the selection of relevant resources. Fink (2003) provides a useful Taxonomy of Significant Learning Outcomes that guides the selection of learning outcomes for a course or subject as follows:

1. Foundational knowledge (facts, concepts, principles).
2. Application (problem-solving and decision-making in real-world situations).
3. Integration (making connections amongst ideas).
4. Human dimensions (learning about oneself and interacting with others).
5. Attitudes (changing one's feelings, interests and values).
6. Learning how to learn (becoming a better and self-directed learner).

An appealing feature of Fink's Taxonomy is that it combines both cognitive (i.e., thinking) and affective (i.e., feelings and attitudes/values) outcomes of learning. The taxonomy is interactive, which means that each kind of learning can stimulate other kinds of learning. The challenge is to select relevant educational resources for the learning outcomes specified — for example, web resources that are appropriate for foundational knowledge, web resources that are appropriate for enhancing learners' decision-making skills, or web resources that are appropriate for changing one's attitudes or learning how to learn. Admittedly, it may not be possible to achieve all the "significant learning outcomes" in one topic. However, the more of these that can be achieved, the richer will be the learning experience.

Figure 11.2: Framework guiding selection and use of OERs and non-OERs



The second process relates to learning activities that are strategically interspersed in each of the ten topics in the SIM. Learning is not so much a matter of getting students to read; rather, it is getting together a set of things for students to do (Ellington & Race, 1993). Learners learn more effectively when concepts and principles are acquired in an active manner. Learning activities are designed to help students monitor their own progress, check their understanding, develop

specific skills, apply what they have learned to real-world situations and reflect on what they have done. Learning activities are most effective when they are problem-centred and involve the student in the activation of prior experience, and in the demonstration and application of concepts to real-world settings (Merrill, Zhongmin, & Jones, 1991). Learning activities seek to get learners to go beyond memorisation and instead to relate ideas in the learning material to their work, to share their rich life experiences, and to reflect on their own thoughts and feelings (Knowles, 1984).

The third process relates to the principles of human learning. These principles are derived from research in cognitive science (Gagne, 1985; Merrill, 1994) over the last six decades and serve as pointers in the selection of web resources towards achievement of the "significant learning outcomes".

- **Detection of Patterns and Connections:** Content that provides an opportunity for learners to "make meaning" by creating their own patterns, models and connections.
- **Elaboration:** Content that provides learners with an alternative explanation of the same ideas using different words and examples. It is like having another teacher explain the same concept or principle.
- **Application:** Content that provides situations in which learners apply concepts and principles to authentic real-world situations, such as case studies.
- **Demonstration:** Content that shows, in a multimedia presentation, the application of a concept or principle via worked-out examples of the solution for a problem.
- **Reflection:** Content that allows for learners to reflect and delve more deeply into the information provided by questioning its relevance and validity, and then to draw conclusions.
- **Alternative Viewpoint:** Content that provides learners with differing viewpoints of the same ideas being taught, especially for ill-defined and controversial issues, where learners are directed to compare differing viewpoints.
- **Multimodality:** Content that presents concepts and principles visually with narration or using narration without visual images, instantiating the different senses of learners through audio clips, video clips and Flash animations.
- **Relevant and Practical Content:** Content that is relevant and applicable to the present or future work of learners.
- **Past Experience and Knowledge:** Content that relates to the life experiences and knowledge of learners (because the majority are adult learners), such as blogs and Twitter.
- **Appropriate Difficulty Level:** Language and cognitive complexity of content selected is high enough to challenge learners, but not so high as to frustrate them.

- **Transference:** Content that provides an opportunity for learners to use the information taught in new settings (i.e., far transfer), such as case studies and simulations.
- **Reinforcement:** Content that seeks to reinforce learning of concepts and principles through drills and practice with immediate feedback, such as tests, exercises and problems.

Case Studies

The following is a sample of courses illustrating the adoption and adaptation of web resources (both OER and non-OER) in the teacher education programmes offered by the School of Education and Cognitive Sciences, AeU. The web resources selected for each of the courses described are based on the "significant learning outcomes" to be achieved and the principles of learning identified.

Example 1

For the course on "Philosophical Ideas in Education", a full textbook titled *Thinkers in Education*, by UNESCO's International Bureau of Education in Prospects, was used. The publication was available online and carried the caveat, "This document may be reproduced free of charge as long as acknowledgement is made of the source." Chapters selected sought to provide Eastern and Western perspectives on philosophical ideas in education. To assist learners who might find the language level difficult, a summary of the main ideas was made available and duly acknowledged. In the summary, learners were probed to think about how these philosophical ideas were applicable in their daily lives as educators.

Example 2

For the course on "Child Growth and Development", materials were obtained from several portals offering relevant OER, such as Wikipedia, OpenLearn, Connexion and TESSA. Materials were reversioned, repackaged, customised and aligned with the learning outcomes for each of the ten topics. Diagrams, pictures and clip art available in the public domain were adapted for use as illustrations in the SIM. Several video clips, which could be accessed online from YouTube, Google Tube and Videojug, were embedded in the module. For example, to demonstrate Piaget's theory of cognitive development, short video clips on experiments of conservation tasks were embedded. To expose learners to shared tacit knowledge, links were made to relevant blogs in which people from different cultural backgrounds discussed parenting styles, one of the topics in the curriculum. This was to give students an insight into other people's opinions on parenting and how they related to the theories and models of parenting styles identified by psychologists and paediatricians. However, students were warned about the contents of such discussions, which could be expressions of very extreme or permissive views.

Example 3

For the course on "Statistics in Education", the SIM developed was an adaptation of several open access textbooks available on Saylor.org, U-Now, University of Nottingham and others. Short video clips from YouTube, Google Videos and

Khan Academy were incorporated to teach specific concepts such as "test of significance", "hypothesis testing", "meaning of the t-test" and so forth. These audiovisual explanations of statistical procedures were found to be appropriate for adult learners apprehensive about statistics. To provide an opportunity for learners to practise analysing data, such as calculation of the t-test, ANOVA and others, links were created to online statistical calculators. Learners were given specific data which they could analyse and comment on using online calculators such as VassarStats and Easycalculation.com. However, the accuracy of these online calculators had to be established by comparing the statistical output with well-established statistical packages such as Statistical Package for the Social Sciences (SPSS).

Example 4

For the course on "Learning and Cognition", a 365-page open access textbook on educational psychology from OER Commons was reversioned and customised for development of the SIM. To enrich the experiences of learners, links were established to audio books (*Classical Works in Psychology*) and audio clips such as those found in LibriVox, which briefly explain key concepts and principles. Links to audio books and audio clips were to cater for the learning styles of learners who are auditory by nature. They also provided learners with the correct pronunciation of key terms and unusual names such as Gagne, Piaget and Vygotsky.

Example 5

Case studies are widely used as a teaching tool in several subjects. For the course on "Emerging Perspectives in Educational Leadership", case studies were extracted from several open access journals. However, many of these case studies were from the United States, United Kingdom and Australia, and had to be reversioned and contextualised to the Asian situation. Learners were asked to compare the experiences of educational leaders in these countries with their respective countries and experiences. Case studies provide opportunities for learners to relate the principles and theories they have learned to real-world situations and practice.

Example 6

For courses such as "Research in Teaching English as a Second Language", "Research in Nursing Education" and "Research in Science Education", learners were required to critically evaluate journal articles. Links were made to selected articles in AeU's Digital Library databases, such as ProQuest, which learners used their passwords to access. In addition, learners were referred to several open access online journals in the respective subjects areas, which they downloaded for their assignments. There are hundreds of open access journals offering full-text articles in PDF and Word document format, and carrying a Creative Commons license. Since some of the subscribed databases are expensive, the author directed learners to articles available in open access referred journals on various aspects of teacher education.

Example 7

For the course on "Teaching Science and Mathematics to Young Children", learners were directed to the thousands of lesson plans available online for preschool teaching and learning, such as those at EducationWorld, Teachers.net and other sites. Several of these lesson plans were available as OER, which enabled teachers to reversion and adapt them to local curriculum needs. These resources provided Malaysian teachers with insights into how preschool teachers in the United States, Canada, Kenya and New Zealand teach mathematics and science to young children.

Example 8

For the course on "Fundamentals of Instructional Technology", a rich database of PowerPoint slides were utilised for several topics. The PowerPoint presentations were available as stand-alone sets of slides or embedded in portals such Slideshare and Slideshow. Links to these slides sought to provide learners with the main points of a topic or chapter and thereby enable a quick overview and preparation for examinations.

Example 9

For the course "Educational Needs of Special Children", various reports and government publications (both OER and non-OER) on research, policies and practices were used. These resources were invaluable in encouraging learners to compare special education practices and policies in Malaysia, the United States and selected Asian countries. Links were made to several professional organisations in special education from different countries (such as the National Association of Special Education Teachers — NASET), which provided learners with up-to-date information on activities and events in the field that they could emulate locally.

Example 10

For the course "Curriculum Design and Development", the basic facts, concepts, principles and theories were derived from open access e-books on Open Library and articles in several open access journals. However, the examples illustrating the concepts and principles tended to be based on the American and British situations. Hence, case studies from India, Indonesia, China and Nigeria were identified and hyperlinked accordingly to provide learners with an Eastern perspective on curriculum development.

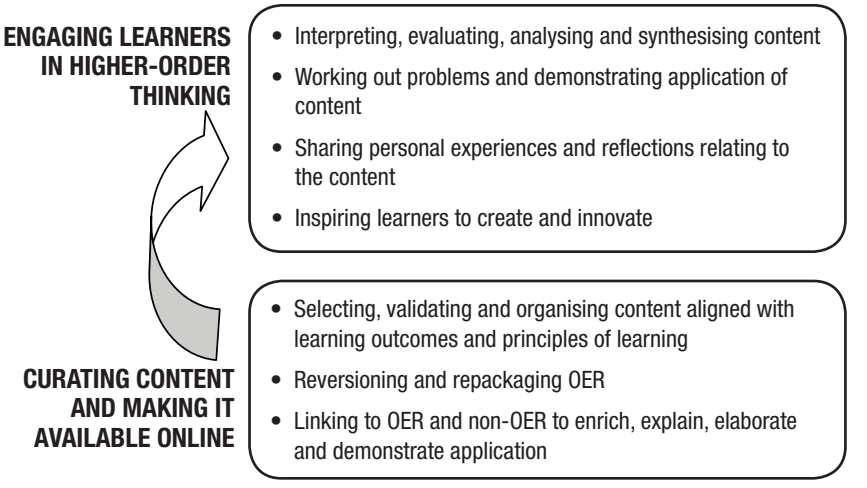
Online tests and exercises enable learners to test their understanding of the content and reinforce learning at strategic points in the SIM. Nearly all the subjects offered in the teacher education programme had links to online tests consisting of multiple-choice items, short-answer items, true-false items and so forth. However, many of these tended to be "non-OER" so permission was sought from publishers and their original form maintained. Fortunately, there is a growing number of sites offering online tests and exercises in teacher education that allow reversioning and customisation, such as those found at Curriki.org. In addition, students were directed to online dictionaries providing quick references to meanings of words, such as Dictionary.com and Merriam-Webster Online. Links were also established

to sites such as Answer.com and About.com Education, which enabled learners to gain a quick grasp of key ideas presented in precise and simple English.

The Shifting Role of Teachers and Learners

The increasing ubiquity and accessibility of OER and non-OER has challenged the spoon-feeding paradigm of learning in institutions of higher education. As shown in Figure 11.3, the teacher is no longer the sole purveyor of content, standing at the podium whilst learners diligently take down notes to be regurgitated later in an examination. The author, with over 20 years of teaching experience at several universities, sees his role shifting to that of a "content curator" or "content aggregator", sieving, sorting and vetting the vast amounts of OER and non-OER on the Web. The selected resources can then be presented in a meaningful and organised manner aligned with the learning outcomes to be achieved, and in ways that meet the learners' digital content needs, before the beginning of each semester.

Figure 11.3: The changing role of educators and learners in higher education



The SIM proves to be an effective way of organising and structuring content for a subject or course. Structuring and organising content is crucial in specifying the scope and depth of content to be studied in a semester or term. It has been the experience of the author that learners are often unsure about their ability to select and evaluate web materials, and prefer to rely on resources that have been given a seal of approval by experts in the subject area. Also, it is relatively easy for them to get lost in the Web, thus wasting valuable time engaging with resources that prove later to be irrelevant or unreliable. Providing learners with relevant learning materials and supporting resources frees up teachers to design appropriate learning experiences that make more productive use of the limited face-to-face interaction.

Teachers can now use the time to engage learners in higher-order thinking, focusing on analysing, evaluating and synthesising content; working out problems and demonstrating application of content; and sharing personal experiences and reflections (Phillips, 2006). Most importantly, teachers should inspire learners to create and innovate, which is the foremost goal of any higher education institution.

The old-fashioned method of broadcast learning will no longer be appropriate for tertiary-level students, who are required to be capable of multitasking and who have learned to cope with information overload (Tapscott, 2009). In the new style of learning, they will have at their disposal all the learning materials at the click of a mouse. Learners will construct information, do something with the resources, create something new — a solution, process or methodology. They will engage in higher-order thinking, collaboratively constructing knowledge, critically evaluating information, discovering things for themselves, and applying concepts and principles to new and unfamiliar situations that are analogous to what they would do in the real world after graduation.

Challenges

Web resources are increasing exponentially by the minute, and based on the author's experiences, using these materials for teaching and learning presents several challenges.

- First, there is the task of having to identify, sieve and authenticate their appropriateness for teaching and learning. It is a daunting task requiring dedicated subject-matter experts who are both "Internet savvy" and willing to spend time searching for such materials.
- Second, there is the monitoring of hyperlinks, as after a period of time some of them become "broken" for various reasons, such as the movement of web servers. Hence, it is the task of the subject-matter expert to promptly replace these "dead" links with equivalent alternative links.
- Third, there is the practice of hyperlinking, which is the very essence of the Web. If strict restrictions are imposed on hyperlinking, especially deep linking, the use of web resources for teaching and learning will be greatly curtailed. This is especially of concern to higher education institutions in less developed economies, where library services are lacking and subscription to online databases is prohibitively expensive.
- Fourth, there is the need for more flexible copyright terms and conditions when using non-OER, which currently tend to be rather restrictive, even for educational purposes. The Web contains many valuable non-OER on teacher education which could be reversioned and repackaged if copyright restrictions were less restrictive.
- Fifth, there is the paucity of web materials written by scholars and practitioners from Asian and African countries in the different fields of education, compared to materials available from the United States, Britain, Europe, Australia and New Zealand. There is an urgent need for open access

materials demonstrating the application of different educational principles in Asian and African settings, and making them available on the Web. Such materials would help educators bypass the long process of resource building and encourage institutions in the region to become producers and contributors to global knowledge.

- Finally, without doubt, the Web will grow as more material is uploaded and more people have not only access but faster access with high-speed broadband. The Web is like the vast universe with, as Carl Sagan might have put it, "billions and billions of webpages out there". This fact prompts the pressing need for more powerful and intelligent search engines that can delve into the depths of the Web to identify OER, as well as for search engines that are more intuitive, making it easier for learners to find what they are seeking.

Conclusion

The proposed framework guiding the use of OER and non-OER for teacher education programmes has proven to be useful. Methods developed by the School of Education and Cognitive Science at Asia e University have begun to be adopted by other schools and centres in the university. Initial efforts have been taken to use the framework for training academics in public and private Malaysian universities in the use of web resources for teaching and learning. Many of the teachers who initially were rather sceptical about web resources became convinced of their potential in teaching and learning. However, the framework will be modified as practitioners from the various disciplines provide feedback.

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