The Promise and/or Perils of Digital Content on Teaching and Learning

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While books have long been the primary source of content in higher education, "The Times They Are a-Changin," as Bob Dylan once sang. It was recently projected by Cisco that there will be more mobile devices on planet Earth by 2017 than people. Contrast this with early predictions from the 1940s and 1950s that the world's computing needs could be met with less than 100 devices[1]. The world has been transformed by computing and information technologies and mobile devices have pushed us even closer to a paradigm shift because now any form of content and/or information can be sent and received by anyone, anytime, and anywhere. This paper will broadly look at the adoption of digital content in higher education within a teaching and learning context. We will examine the types of digital content that are used for teaching and learning, some of the promises of digital content, and some of the perils and concerns that must be examined as digital content becomes dominant within higher education.

Types of Digital Content

The term "digital content" in higher education is often associated with e-books and unfortunately not much more in many cases. However, if we limit our view to this narrow sector of digital content, we are missing tremendous resources and opportunities to transform education and adapt teaching methods and opportunities to the way today's students learn.

One excellent definition of digital content comes from the IT Law Wiki[2] which describes it as, "any content that is published or distributed in a digital form, including text, data, sound recordings, photographs and images, motion pictures, and software." If we use this as a basic definition, it's easy to see that e-books are simply one small piece of an enormous puzzle.

From basic audio/video content applications for mobile devices, to simulations and interactive games, to 3D modeling or virtual realities in which students participate as part of the learning experience, the types of digital content are vast and provide the ability to address the varied learning styles of our students. For example, the ability to explore the universe through a virtual world, or participate in a space shuttle launch from anywhere in the world, are not dreams of the future but realities of today. Imagine providing students the opportunity to explore, or even build, a Shakespearean amphitheater proportionally to the period. Today, there's no need to imagine

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[1] Sir Charles Darwin 1946: "it is very possible that ... one machine would suffice to solve all the problems that are demanded of it from the whole country.(from Copeland, Jack (2006). *Colossus: The Secrets of Bletchley Park's Codebreaking Computers*. Oxford University Press. p.109); Douglas Hartree, around 1951: "I went to see Professor Douglas Hartree, ... in his opinion, all the calculations that would ever be needed in this country could be done on the three digital computers which were then being built—one in Cambridge, one in Teddington, and one in Manchester. No one else, he said, would ever need machines of their own, or would be able to afford to buy them". (Lord Bowden (1970). *American Scientist*. **58**: 43–53) Howard H. Aiken in 1952: thought that "if there were a half dozen large computers in this country, hidden away in research laboratories, this would take care of all requirements we had throughout the country". (Cohen, I. Bernard (1998). *IEEE Annals of the History of Computing* 20.3 pp. 27-33)

[2] http://itlaw.wikia.com/wiki/Digital_content

these opportunities, because these opportunities and the range of types of digital content needed to provide these opportunities are currently available to faculty and students, and in many cases are free.

The various types of digital content can also be defined by use and delivery method. For example, some digital content is designed for one-time use, while other content is designed to be available long-term, such as online movies that are used as examples in a course. Some content is pushed, like Facebook and Twitter, while other content is pulled, like with Netflix or Hulu. Some content is freely available in the public domain, while other content is very expensive. Each type of digital content has pros and cons, requiring faculty to develop a basic strategy for incorporating digital content within courses in order to enhance teaching and learning, while preventing students from getting lost in the sea of information.

The types of digital content available continue to evolve and one can only imagine the content types that will become available in the future. Digital content expands the relationship between knowledge, learning, instruction and the nature of media in the curriculum and the classroom.

The Promise of Digital Content

Digital content within college and university courses offers a tremendous teaching and learning opportunity for students and faculty. When digital content incorporates audio, video, images and interactive charts throughout a digital textbook, learning is much more interactive and integrated. For example, a student does not need to try to manually sync a music textbook reading with the accompanying CDs. Instead, the student listens to the music while watching which part of the score is being played. The student navigates within the musical notation to listen to a specific part of the song. Such digital content helps students learn as they can directly manipulate and interact with the content.

Digital content that contains video, audio, and interactive charts by its nature is more engaging to students. Furthermore, digital content can better serve differentiated instruction, where the teaching is personalized depending on the prior knowledge of the student. Through instructor guidance or digital quizzes, students can be given the content that is at the correct level - challenging but not frustrating.

The portability of digital content benefits students not only for its convenience, but also because the student is more likely to have the content when they are applying what they read, either during classroom discussions or when completing their homework.

Digital content can more easily be integrated with other systems. The integration of a digital textbook within a learning management system means the student spends more time doing the assignment rather than gathering the assignment details. The faculty member has the potential to assess the value of a particular reading by viewing statistics about which students accessed the reading and how those students performed on a particular assignment. Daphne Koller, one of the Coursera founders, emphasizes the amazing potential to learn about the effectiveness of online teaching and learning, given that Coursera content is entirely digital and the huge course enrollments yield statistical power[3].

We are witnessing the unbundling of course textbooks now that they are digital. A faculty member may mix and match chapters or sections depending on the course. Faculty can basically create custom "textbooks" with commercial publishers as well as newer online publishers, such as Flat World Knowledge.

Finally, and perhaps most aspirational, is the potential for digital content to foster constructivist

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[3] http://www.educause.edu/ero/article/power-data-moocs

learning, where students participate in knowledge creation. For example, student groups can use wikis or desktop publishing tools to write sections that together form the course readings. While such activities may not be published outside of the learning management systems, they are happening in select classes within colleges and universities today. Common digital book features allow students to share their highlights or annotations with others, which fosters a sense of community.

The Challenges of Digital Content

While the promises of digital content are very encouraging, institutions must ask some difficult questions before forging full steam ahead. Until recently, publishing one's work was a very expensive and arduous task, but today anyone can type text, develop videos, audio, and basic multimedia and then simply click a button to "publish" their material to the masses. While this has benefits, quality control and accuracy are often missing.

American author Edgar Allen Poe made the following statement in 1845, "The enormous multiplication of books in every branch of knowledge is one of the greatest evils of this age; since it presents one of the most serious obstacles to the acquisition of correct information by throwing in the reader's way piles of lumber in which he must painfully grope for the scraps of useful matter peradventure interspersed. " Considering the fact that 100 hours of new video content are uploaded to YouTube every minute[4], these concerns are even more valid today.

While the elimination of barriers to publish certainly diminishes the average quality of both academic and non-academic content, this freedom also increases the possibility of finding "gold nuggets" if one is willing to methodically wade through the overflowing river of content.

Institutions, and ultimately the faculty and departments, must clearly define how digital content are selected and utilized to contribute to the learning outcomes of each course and program. Simply allowing digital content to grow and be adopted organically within programs may ultimately create future problems, including potential problems with accreditation. Program review is challenging enough within programs that utilize common textbooks and content from publishers. Imagine allowing each faculty member to select a different textbook for the same course without any discussion or process. This is not to suggest that faculty freedoms be removed, but rather that digital content selection is purposeful and collaborative within academic programs, particularly where such content is mandatory or a critical component of the curriculum. A centralized delivery platform that is integrated with multiple content development and delivery systems can help alleviate some of these issues and can link content to specific learning objectives.

The economics of digital content, while very promising, can also have a negative impact on students' pocketbooks in some cases. For example, requiring students to purchase a textbook (electronic or print), as well as a subscription to an online lab or service, is more expensive than simply renting a textbook from the bookstore in most cases. In some cases students will actually enroll in one instructor's course over another instructor's course simply because the textbook or material is less expensive.

Another area of concern is that of intellectual property and ownership/control of content. As faculty, we take ownership of the content we create very seriously and expect others to respect our intellectual property. However, are we citing other's content properly and giving credit where appropriate? Also, what happens when the content owner removes their content from the public domain? Simply copying someone else's content onto your own server and claiming "fair use," is questionable to say the least. Ease of use and copying of digital content must be balanced with

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4   http://www.youtube.com/yt/press/statistics.html

fair use and obtaining necessary permissions. Furthermore, numerous issues arise when publishing content to third party platforms where it is clearly communicated that content ownership transfers to the platform provider.

Accessibility, both from an ADA (Americans with Disabilities Act of 1990) standpoint, as well as the physical technologies necessary to utilize digital materials, must be considered as part of the process. For example, many faculty integrate publisher's content into their courses that are delivered through their institution's learning management system (LMS), making it seamless for students to access all content through a single interface. However, while the content may appear to be part of the course, the publisher's content may actually reside on an external server and therefore may not be modified in any way according to the publisher's terms of use. There have been cases where this has meant that even if content was inaccessible to students with cognitive and sensory impairments, faculty could not modify the content in any way, thus requiring faculty to adapt their approach or offer alternative assignments that are "as effective" as the original assignment.

Finally, who provides support when there are problems accessing content, whether static or interactive media and applications? Is your IT Help Desk prepared to assist students who are unable to access third-party multimedia elements of courses? Do you have reference librarians trained to deal with digital content? Such issues must be considered during the planning and development process of your digital content strategy.

Summary and Overview

There are many choices that must be made as the movement to embrace and utilize digital content to advance teaching and learning grows. Choices over what kind of digital content will be actively used, how it will be distributed, and what tools will be needed are going to require much work and debate. With choices also come responsibilities, and a major responsibility for consideration concerns the role of the instructor, how best to integrate digital content into teaching and learning, how to teach discernment to students and instructors who rely upon digital forms of content, and how to ensure that no student is disenfranchised by the educational system due to lack of access or understanding.

Higher education institutions must make sure that the planning for and management of digital content follows both good technology practice and support good pedagogy. CEO's and CAO's must support strategic and tactical planning in the area of content management and make sure institutional policies dealing with content are clear and updated regularly. Deans, librarians and instructional staff must work with technology leaders to ensure that content management systems, learning management systems, library management systems and student systems are linked and support faculty and student needs. Regular review of policies, technology applications and infrastructure, training and support activities and changing student needs will ensure that reliable and valid content are available in any and all forms necessary to support quality teaching and learning.