Accessible Cyberlearning in Practice

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Abstract

The Institute on Disability and Public Policy (IDPP) for the Association of Southeast Asian Nations (ASEAN) Region was formally established in 2011 to partner with governments in the ASEAN region to foster public policies that promote persons with disabilities entering society to compete on a par with their non-disabled peers and prepare disabled leaders in the field of public policy. To address this mission, the world's first virtual master's degree program focused on the complex intersection of disability and public policy in the ASEAN Region using advanced cyberlearning techniques was created and specifically marketed to persons with disabilities in the ASEAN region. The infrastructure needed to deliver this type of program to learners in the ASEAN region and instructors all over the world required an accessible cyberlearning environment. This paper will explore the practical application of designing, developing and implementing an accessible cyberlearning environment.

Keywords

Accessible Cyberlearning, Cyberinfrastructure, Distance Learning, eLearning

Introduction

The Institute on Disability and Public Policy (IDPP) for the Association of Southeast Asian Nations (ASEAN) Region was formally established in 2011 with major funding from the Nippon Foundation. Its main task is to partner with governments in the ASEAN region to foster public policies that promote persons with disabilities entering society to compete on a par with their non-disabled peers and to prepare leaders with disabilities in the field of public policy. One of the initiatives to address this charge was the establishment of the world's first virtual master's degree program focused on the complex intersection of disability and public policy, the Master of Arts in Comparative and International Disability Policy (CIDP) degree, offered by the School of International Service at American University. In an effort to address the lack of access of persons with disabilities to postsecondary education in the ASEAN region, particularly in the field of public policy, The Nippon Foundation offered full fellowships for select CIDP students, with preference given to students from the ASEAN region who are blind or visually impaired, deaf or hard of hearing, and/or mobility impaired.

To best support the IDPP's mission of providing unparalleled opportunities for advanced academic studies for students, faculty, and staff (with and without disabilities), creating an accessible cyberlearning environment was imperative to the CIDP's effectiveness at achieving its mission of delivering an innovative curriculum not limited by physical constraints and geographic location of knowledge resources. This paper will explore the practical application of designing, developing, and implementing an accessible cyberlearning environment.

Cyberlearning

Cyberlearning is a broad term that many equate to online learning and distance education. For the purposes of the IDPP program, the definition that most accurately reflects the learning environment is provided by the NSF Task Force:

> Cyberlearning offers new learning and educational approaches via networked computing and communication technologies, and the possibility of redistributing learning experiences over time and space. Our scope incorporates the entire range of learning experiences over the course of a lifetime--not only formal education, not only in classes, but throughout the waking hours. (NSF Task Force on Cyberlearning 10)

To address the objective of the CIDP, NSF's definition best captures the learning environment required to support the transfer of knowledge and skills needed to develop change agents and foster learning in disability public policy.

The shape of cyberlearning is changing daily as more and more institutions embrace the technologies now available to deliver instruction synchronously and asynchronously (Yearwood and Nichols 1532). To establish a solid cyberlearning environment, it is imperative to allow the educational and pedagogical needs of ALL to drive the customization of the cyberlearning environment and not the technology. One of the essential tools needed to manage the delivery of content asynchronously was a Learning Management System (LMS) which provides an integrated set of web-based tools for teaching and learning: "Some tools are static and allow instructors to transmit information to students, such as a syllabus, assignments, reading materials, and announcements. Other tools are interactive…and allow students to communicate, synchronously and asynchronously" (Malikowski, Thompson, and Theis 150).

To provide synchronous teaching and learning, a virtual classroom (VC) is required to support and facilitate this engagement. Synchronous learning most mimics the traditional classroom where instructor and student can actively engage in lecture and discussion real-time:

> Advantages of using a synchronous learning environment include real time sharing of knowledge and learning and immediate access to the instructor to ask questions and receive answers. However, this type of environment requires a set date and time for meeting, and this contradicts the promise of "anytime, anywhere" learning that online courses have traditionally promoted. (Skylar 71)

VC software typically provides a platform for sharing real-time audio and visual presentations, similarly to a narrated PowerPoint slide presentation; to engage the participants during the lecture, instructors can utilize polling/quiz features to receive real-time feedback. While in the VC the instructor can integrate Internet browsers into the platform and application sharing, as well as send small groups of students to breakout rooms to collaborate using the audio, whiteboard, chat, application sharing and web browsing tools. In addition to the real-time offerings, each class session can be recorded and shared via a web link, audio, video and/or transcription to those who were absent or who want to review a previous class session.

The final component to establishing a cyberlearning environment is identifying strengths and limitations of the Internet networks available to students and instructors in the ASEAN region as well as faculty members in the United States to transmit and support teaching and learning. As described by Rao, an Integrated Communication Network (ICN) is needed to support the acquiring of information in various signal formats (e.g. video, image, text, audio, voice, data, Internet, email, etc.). The ICN helps to seamlessly integrate and disseminate

information by using efficient and cost effective communication modes to various destinations for public use (Rao 226). A modified version of Rao's concept of ICN can be seen in Figure 1, which helps illustrate all of the variables that need to be considered for the CIDP program.

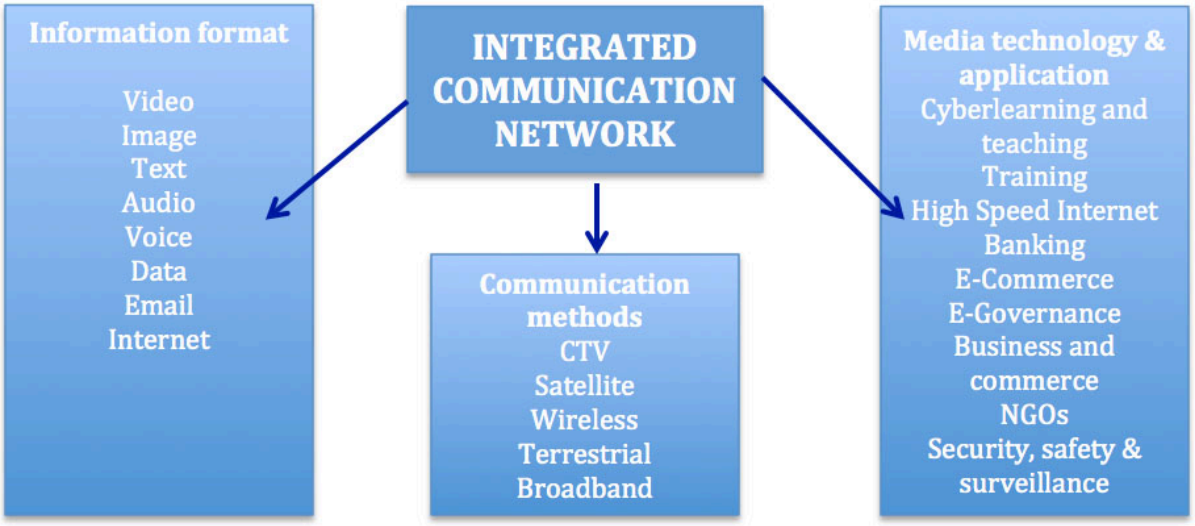

Fig. 1. Modified Version of the ICN Concept

Approximately 33% of households in the ASEAN region have Internet access, according to the International Telecommunication Union (ITU)'s 2013 report, which features 2013 estimates for ITU's key telecommunication/ICT indicators (Sanou 3). Many of these residents live in rural areas where their Internet signals are not consistent and/or not existent. The digital divide is not restricted to developed and developing countries but is also apparent between urban and rural regions within every country (Johnson et al 143). When designing for this type of disparity, it is imperative that the LMS and VC can function effectively in low-bandwidth to support the respective ICN for a particular ASEAN region.

Accessible Cyberlearning

To create a cyberlearning environment that was accessible to ALL, best practices were

established to ensure that the utilization of the LMS and VC were conducive for the desired learning and pedagogical outcome. Often referred to when speaking of physical environments (Burgstahler and Cory 9), the term "accessible" in the case of cyberlearning must also consider the virtual as well as physical environment of all participants (Myhill et al 157). The key tenets of creating an accessible cyberlearning environment required the adoption of Universal Design for Learning (UDL) principles and best instructional design practices for online teaching and learning. The first tenet, UDL, was developed at the Center for Applied Special Technology (CAST), and is described as a flexible approach to curriculum design that offers ALL learners full and equal opportunities to learn. The primary principles of UDL are as follows: provide multiple means of representation, provide multiple means of action and expression, and provide multiple means of engagement. According to Coombs, cyberlearning, "by its basic nature, limits the availability of some of the learning modalities discussed by CAST" (8), but by adhering to the three primary guidelines of UDL, the initial limitations are no longer barriers.

To establish effective instructional design practice for online teaching and learning, the major guidelines established for the CIDP were that all courses should contain strong course structure and content, course introduction, course communication, course organization and design, course assessment, and course feedback and evaluation. Applying these basic principles for online teaching and learning to the LMS and VC environment required the CIDP team to create faculty training on how to effectively use Blackboard Learn (BL) and Collaborate (BC) to address the needs of ALL learners. For example, utilizing the blog feature in BL for asynchronous course discussion versus the discussion board was implemented in all CIDP courses due to the inaccessibility of the threaded discussions with screen readers. Another example of the modifications made to the VC was using the video functionality for sign language

interpreters. The accessible cyberlearning best practices that have been designed and implemented in all of the CIDP courses ensure that the learning environment supports ALL.

Creating an Accessible Cyberlearning Environment

The IDPP cyberinfrastructure process was developed as part of the research and development necessary to support the final conceptualization and planning of the Cyberinfrastructure. During this phase, the research team was tasked with creating an accessible cyberinfrastructure to administer the institute and deliver asynchronous and synchronous content. The goal was to identify a recommended organizational structure and activities for the IDPP, along with a collection of social practices and accessible technologies to support the administrative operations of the institute and to deliver content. The objective of this component was as follows:

1. **Preliminary Research**
    - Conduct scholarly and practitioner literature review
    - Research ICT and political climate in region
    - Identify relevant social practices and necessary organizational elements for administering the IDPP
2. **Evaluation**
    - Identify and evaluate potential technologies and platforms for the cyberinfrastructure
    - Evaluate the proposed CI's accessibility compliance and fulfillment of identified tasks
3. **Testing**
    - Construct a functional demo portal of the IDPP's potential cyberinfrastructure

- Test accessibility manually and with automated tools (WCAG 2.0 standards)
- Conduct user testing for accessibility and usability (collaborate with MLK Library)

The first step towards a recommended suite of technologies was to identify a pool of candidates for evaluation. A series of web searches was conducted to identify the best, most accessible LMS and VC. After identifying candidate technologies, the next task was to evaluate each for functionality and accessibility based on matrices that initially identified social practices and the WCAG 2.0 accessibility standards.

After careful evaluation of the available LMSs and VCs, it was clear that Blackboard Learn and Collaborate were the two most progressive technologies readily available to help serve in establishing the cyberlearning environment. It does need to be mentioned that after the initial evaluations, BL had acquired many of the competitors, so selecting a LMS became more limited. In addition, the CIDP program was going to be based at a host university that already had an agreement with BL, and BC was a new acquisition that combined the best assets of two the most popular VC's, Elluminate and Wimba. Lastly, to ensure that enhancing the accessibility would be an on-going process, IDPP members were added to the accessibility tasks force for both respective platforms to help inform Blackboard how to best support the needs of ALL.

Methodology for Evaluating Accessible Cyberlearning

As stated by Burgstahler, "[S]ome people with disabilities, even if they use assistive technology, cannot access the content of electronic and information technology products—World Wide Web pages, video clips—if they are not designed to be accessible to them" (11). It is imperative that the CIDP program uses an iterative evaluation approach to accessible cyberlearning to ensure that as technology changes so do the standards of providing an accessible

cyberlearning environment. This iterative evaluation approach is both formative and summative and will happen at key semester and program milestones. The iterative design approach is a student-centered approach that takes into account UDL, online teaching and learning, instructional design and faculty training, student motivational factors, as well as the entire cyberinfrastructure. It is through this iterative approach to evaluation that the CIDP program can ensure that the program provides exemplary support to ALL participants:

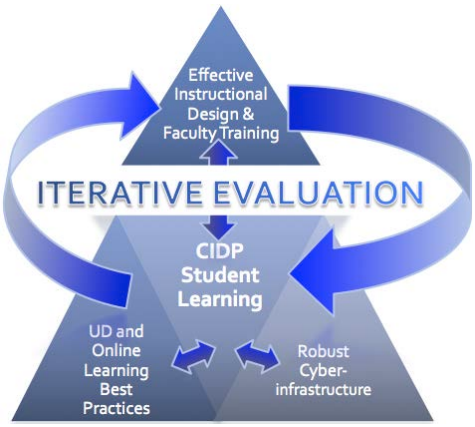

Fig. 2. CIDP Iterative Evaluation

"Good planning and good plans involve iteration; simple cause-and-effect thinking is no longer enough," when establishing an accessible cyberlearning environment (Chance 40).

Preliminary Results

The CIDP program graduated its first cohort of students in December of 2012. These students were blind or visually impaired, deaf or hard of hearing, or mobility impaired. Upon formative evaluation of students and faculty, it was noted that BL in general functioned well but having to learn how different faculty members organized course material caused some initial confusion. Blackboard Collaborate was conducive for most learners but the chat feature was not accessible to students using screenreaders. It is clear from the feedback from students and faculty

that an exemplary execution of an accessible cyberlearning environment was not fully achieved, but the infrastructure was proficient, and ALL learners were able to participate in the program and gained knowledge and experience that positions them well to serve as change agents and leaders in disability and public policy. Our iterative evaluation approach provides continuous feedback that is used to inform decision-making and improve the cyberlearning environment.

Conclusions

The goal of the CIDP Master's degree program is to empower graduates to become global disability policy leaders via a rigorous theoretical and practical curriculum. The infrastructure needed to deliver this type of program to learners in the ASEAN region and instructors all over the world requires an accessible cyberlearning environment. This environment must support courses that incorporate Universal Design for Learning principles, and are accessible to blind or visually impaired, deaf or hard of hearing, and mobility impaired students. In addition, the cyberinfrastructure consists of an innovative combination of virtual tools to make the program as accessible as possible. Our evaluation methods allow us to be responsive to student needs and continually improve the accessible cyberlearning environment. Improvements have already been made following the evaluation of the first cohort of students. The CIDP accessible cyberlearning environment supports courses that prepare persons with disabilities to impact and influence the public policies that directly affect the disability community. Iterative evaluation will continue to be an ongoing critical component of implementing the CIDP Master's program to ensure the accessible cyberlearning environment adapts to the changes in technology and student needs to prepare them to be global disability public policy leaders and change agents, the ultimate goal of the CIDP.

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