

Developing and Evaluating an Accessible Cyberlearning Training (ACT) Program for Faculty via a Virtual Center for Teaching and Learning

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Abstract

Many universities and faculty members are exploring the potential of online learning. However, while it is increasingly likely these faculty members will have students with disabilities, most instructors have little or no experience teaching such students. In addition, there are almost no models for training faculty to design and implement accessible cyberlearning in higher education. This is especially true when classes include students from multiple disability communities simultaneously (e.g. deaf and hard of hearing, blind and visually impaired, and mobility impaired), as well as students from multiple developing countries. This paper addresses those limitations by presenting the Accessible Cyberlearning Training (ACT) Model. Data come from the pilot developed for the first masters program focused on global disability policy in ASEAN. It also stems from the IDPP's commitment to designing, disseminating, and evaluating best practices in online learning for "All". The paper includes key evaluation components and recommendations for future research.

1. Introduction

The proportion of chief academic officers in the United States reporting online education as critical to their institution's long-term strategy is close to 70% [1]. This trend is also evident in universities around the world [34]. However, given that 143 countries have signed and ratified the UN Convention on the Rights of Persons with Disabilities (CRPD), which includes in Article 24 a commitment to "ensure an inclusive education system at all levels," it is increasingly likely these faculty members will have students with disabilities in their classes [33]. Most

instructors have little or no experience teaching such students, especially in online environments. There are almost no models for training faculty to design and implement accessible cyberlearning in higher education. This is especially true when classes include students from multiple disability communities simultaneously (e.g. deaf and hard of hearing, blind and visually impaired, and mobility impaired), as well as students from multiple developing countries.

In an effort to provide the infrastructure to support this long-term strategy, institutions are providing faculty professional development and support to teach basic online courses via centers of teaching & learning (CoTL). "CoTLs promote quality teaching by encouraging and providing capacity for academic staff to improve their instructional skills. They address topics ranging from classroom management to course design and how to work in different course delivery environments" [20]. These centers include instructional developers, educational technologist, and content experts who have the professional and theoretical background to serve the entire campus. CoTLs have been able to help faculty members to "incorporate innovative teaching practices" into their course, but most of them are not including sufficient content on how to develop content and pedagogical strategies that will support adequately the needs of students with disabilities. [19].

This paper addresses these deficiencies by presenting our development and evaluation of the *Accessible Cyberlearning Training (ACT) Model*. The ACT Model uses a blended instructional design approach, combining synchronous and asynchronous as well as face-to-face and remote participation. The model takes into account best practices in online teaching and learning, and integrates universal design for learning into its pedagogical and substantive approach. The ACT Model is designed to provide a framework to prepare faculty to design online courses for "All" with a particular focus on students who are deaf or hard-of-hearing, blind or visually impaired, and/or mobility impaired.

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To our knowledge, this is the first training program focused on accessible cyberlearning, that also recognizes the challenges of cross-cultural communication, works across developing and developed countries, and across disability groups. Development of the ACT Model is supported by the Nippon Foundation and is currently being piloted with faculty, staff and students in the ASEAN region. The *Accessible Cyberteaching Certification Program*, presented here, is designed to ignite faculty members to “ACT Now” by providing them with the instructional design and development techniques that ensure their classes are accessible for “All” students.

1.1. Purpose

The purpose of this paper is to present a theoretically grounded and empirically tested model for accessible cyberteacher training that is effective in global, cross-cultural environments. Like other faculty professional development programs, the ACT Model includes three components: (1) self-directed learning experiences, (2) formal professional development programs, and (3) organizational development strategies [5].

Caffarella & Zinn, describe self-directed learning experiences as faculty planned activities, implemented, and evaluated via self and peer assessments; and takes place as a result of preparing course materials, teaching classes, designing new courses, and revising curriculum [5].

Formal faculty professional development programs range from programs focused on teaching, including effective integration of instructional technology, to those stressing the scholarship of teaching and learning. “The explicit purpose of organizational development is to effect organizational change rather than individual change. Usually this type of professional development is implemented by administrators and/or by centralized offices of faculty and organizational development” [4].

The ACT Model takes into account all three of these elements by providing the following: 1) a formal certification process to demonstrate ability to apply self-directed learning, 2) formal faculty development in the design and delivery of quality accessible cyberlearning courses (at a basic and advanced level), and 3) establishment of a regional virtual CoTL.

Participants in the training will fully design and develop courses including digital content modules in an accessible cyberlearning environment. The Institute on Disability and Public Policy at American University is the certifying organization. If participants successfully complete all three levels of

training and become *Certified Accessible Cyberteaching Trainers (CACT)*, they will enhance the infrastructure that provides continuous accessible cyberteaching and thus expand the virtual CoTL. Thus, the ACT Model lays the foundation for establishing a regional organizational development and support center for accessible cyberlearning that could be replicated in other countries and regions.

2. Literature review

2.1 Instructional Design

Instructional design as a field has been redefined a number of times since 1963 when the field was emerging. This is not surprising as technology has grown exponentially over the past 50+ years and the field must consider new modes of teaching and learning as technology evolves, especially including online learning. For the purposes of the project and research described in this paper, we will use a current definition of the field put forth by Reiser:

“The field of instructional design and technology (also known as instructional technology) encompasses the analysis of learning and performance problems, and the design, development, implementation, evaluation, and management of instructional and non-instructional processes and resources intended to improve learning and performance in a variety of settings, particularly educational institutions and the workplace.” [22]

Merrill and Wilson (2007) acknowledge that instructional design is often conducted by persons with no instructional design background at all [16]. They call them *designers-by-assignment* and state that 95% of all instructional design is conducted by non-designers [16]. The faculty who participate in the *Accessible Cyberteaching Training Workshop* will undoubtedly fall into this category, being specialists in public policy and related fields but lacking in knowledge of pedagogically sound teaching practices for online learning and especially lacking in knowledge of the needs of persons with disabilities in an online environment. The ACT Model addresses this deficiency by content prepared for such participants.

2.2 Universal Instructional Design

The foundation of Universal Instructional Design (UID) and subsequently the ACT Model is the application of Universal Design for Learning (UDL) principles to instructional design. The UDL principles, developed at the Center for Applied Special Technology (CAST), include a focus on

providing multiple means of 1) representation; 2) action and expression; and 3) engagement. [6]

UID values each student’s unique perspectives and accommodates individual differences in students’ backgrounds, culture, interests, abilities, and experiences [17]. There is no single method for representing information that will provide equal access for all students; no single method of expression that will provide equal opportunity for all students; no single way to ensure that all students are engaged in learning because any method that works for some students, presents barriers...for others [11].

2.3 Cyberlearning & Cybertraining

Cyberlearning, as defined by the National Science Foundation Task Force is, “learning that is mediated by networked computing and communications technologies” [18].

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 [4].

The IDPP uses an iterative evaluation approach for accessible cyberlearning guided by a Cyberlearning Instructional Design, Development and Evaluation (CIDDE) committee to ensure that core competencies of the program are met [9]. To effectively prepare faculty to be exemplary as cyberteachers, a blended cyberteaching training program was created [21]; [15]; [32]; [26]; [27]; [9].

This blended approach (i.e. synchronous and asynchronous) to cybertraining occurs when “computer is the medium of instruction (e.g. computer-based training)...and when computer technology is used as a tool to support teaching and learning (e.g. use of website by instructor, e-collaboration)” [12]. Additionally, research also recommends incorporating face-to-face with online teaching, in order to build trust and rapport early [9].

2.4 Accessible Cyberlearning

As a distributed networked organization, the IDPP included faculty members from multiple institutions teaching in its masters program. In order to ensure the teaching and learning needs of its students, instructors, and staff, IDPP developed an accessible cyberlearning environment [9]. This environment must be able to support “All” learners within existing

limitations of Internet bandwidth to support this blended approach [2]; [3]; [7]; [10]; [14]; [24]; [25]; [28]; [29]; [30]; [31]; [32].

Essential elements of creating an accessible cyberlearning environment included the adoption of UDL principles, which provides a flexible approach to curriculum design that offers “All” learners full and equal opportunities to learn [6].

According to Coombs, cyberlearning, “by its basic nature, limits the availability of some of the learning modalities discussed by CAST” [8] but these initial limitations are no longer impossible barriers to learning [3]. The ACT Model highlights how to overcome some of these barriers using existing commercial technologies.

3. Conceptual Framework

This literature review and more than three years of conducting and evaluating courses for the IDPP’s virtual master’s program, which included primarily students with disabilities, shape the conceptual framework for this study. This framework acknowledges the different roles of faculty members. It also highlights the fact that many mediating factors beyond specific faculty development activities can influence teacher effectiveness, and that outcomes can be observed at a number of levels [23]. To classify and analyze outcomes, we used Kirkpatrick’s model of educational outcomes (Kirkpatrick, 1994), which offers a useful evaluation framework for this purpose (see Figure 1).

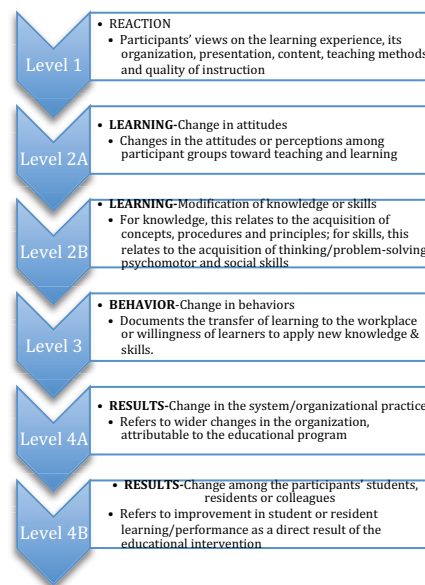


Figure 1. Kirkpatrick's model for evaluating educational outcomes (modified)

The model describes four levels of outcome: learners' reaction (to the educational experience); learning (which refers to changes in attitudes, knowledge and skills); behavior (which refers to changes in practice and the application of learning to practice); and results (which refers to change at the level of the learner and the organization). In his original work, Kirkpatrick (1967) asserted that these outcomes were not hierarchical and that the model is intended to provide a more holistic and comprehensive evaluation that can inform policy and program development" [23].

4. Research Questions

Based on this conceptual framework, the following preliminary research questions guided the development of the ACT Model and the outcomes evaluation:

1. What are the key elements of an accessible cyberteaching training model?
2. What are faculty's reactions to the accessible cybertraining experience?
3. What factors related to the cybertraining experience most contribute to faculty's perceived competence about their potential to be effective accessible cyberteachers?

5. Methodology

This study takes a multi-phased mixed methods approach, the background to which is the result of three-plus years of conducting and evaluating courses for the IDPP's virtual master's program. Each semester, courses were evaluated individually. At the end of each year, an evaluation was conducted of the program as a whole with input from both students and faculty. The results of the evaluations were used to suggest improvements in course design that would benefit persons with disabilities. The core of the ACT Model was developed based on these results and a thorough review of the literature in the related areas.

5.1 Pilot Study

On February 11, 2013 a pilot of the Level 1 Basic Accessible Cyberteaching training was conducted at the [University Center for Continuing Education]. The training consisted of a brief overview of the IDPP and Accessible Cyberlearning, as well as technical training in Blackboard Collaborate (i.e. virtual classroom) and Moodle (i.e. Learning Management System). There were 10 participants (6 faculty and staff members from the University of

Malaya, 4 staff members from AU). This training was delivered in face-to-face mode, demonstrating to the participants how to effectively integrate instructional technology (e.g. narrated and closed captioned videos, PowerPoint slides, etc.) to enhance learning while also providing participants with a guided demonstration and application of basic accessible cyberteaching skills and knowledge.

Some of the technical skills included in the training are as follows: Setting up Closed Captioning, Lecturing in Bb Collaborate, Developing a Basic Course in Moodle. Before moving on to the next skill, the facilitator and staff assistants would go to each computer to see if the participant was successful. If participants were struggling either a peer would assist or a facilitator would provide individual coaching to resolve the issue and provide encouragement.

To support learners as they worked on their basic courses after the training, the final assessment, a course repository was created in Moodle that provided step-wise tutorials (pdf and video) on each individual technical skill included in the training. Participants could refer to this repository while developing their basic level accessible course for certification following completion of the training.

The learning outcome for those participating in the pilot study was as follows:

- Upon completion of this training, participants will have the knowledge and skills needed to develop a basic accessible course.
 - Participants will develop a basic accessible course after the training that will be reviewed for certification.
 - Upon certification participants can advance to Level 2 training and learn how to develop a fully accessible course and apply more advanced accessible cyberteaching techniques.

At the end of the training participants were given the following directive to complete in order to earn their certification:

- Develop a basic course with content for at least one month that includes the following
 - Weekly reading assignments
 - Lectures (5 minutes-1 hour)
 - URL link of Blackboard Collaborate session recording
 - PowerPoint file (with lecture notes if available)
 - At least one assignment

- At least one discussion forum
- Add a member of the evaluation team to your course as a student and send them an email to inform them the course is ready for review
- Upon successful review you will receive your certification certificate and can move on to Level 2 training

5.2 Instruments

The pre-pilot training survey was designed to garner a baseline account of participants' knowledge and experience of accessible cyberlearning (both technical and pedagogical skills) as well as their perception as it relates to Levels 1 & 2 on the Kirkpatrick model. Measurement development was informed by input from the evaluation committee, and the IDPP team. The pre-pilot training survey also collected data on participants' communications, collaboration and social media habits. It also garnered information that would impact participants' perception on the importance of accessible cyberlearning.

In addition to the pre-training survey, a focus group was used to conduct interviews to assess the training effectiveness with respect to addressing the learning outcomes and to conduct an after action review to improve the program for its next implementation.

5.3 Data collection and analysis

The confidential pre-pilot training survey was distributed via the web to participants at the beginning of the training session. The post-training focus group interviews were conducted immediately after the training and helped inform the after action review. The data from the pre-training survey along with the interview feedback was used as input to revise the pilot training to improve the program for its planned full roll out.

Descriptive statistics were used to summarize this small dataset. Qualitative responses were also helpful in interpreting some of the results.

6. Findings

6.1 Key Elements of ACT Model

In answering our first research question, we developed the core of the ACT Model, including three levels of training. The first level provides a basic introduction to accessible cyberlearning; the

second, adds advanced training; and the third level includes a 'train the trainer' [13] model, as indicated in Figure 2.

Accessible Cyberlearning Certification

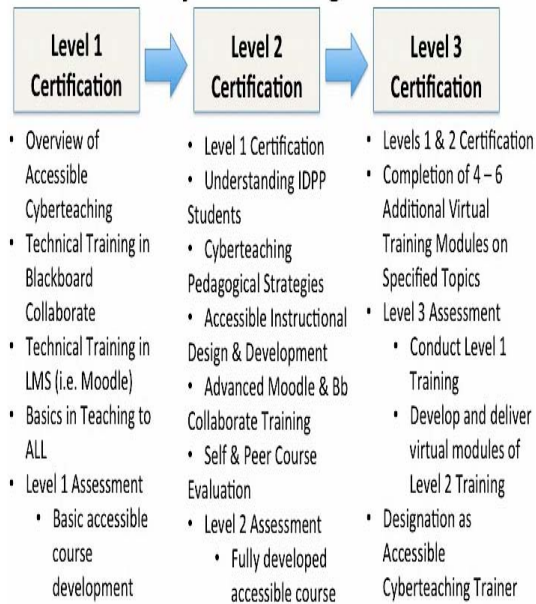


Figure 2: ACT Model Certification Levels

The more detailed description of the ACT Model provided below includes an outline of the learning outcomes for each of the three levels.

Level 1-Basic Accessible Cyberlearning

Level 1 Learning Outcomes

- Upon completion of this training, participants will have the knowledge and skills needed to develop a basic accessible course for IDPP students.

Level 1 Structure & Assessment

- Training includes a face-to-face session followed by asynchronous learning resources to support the development of a basic accessible course.
- Participants will develop a basic accessible course after the training that will be reviewed for certification.
- Participants will develop a basic awareness of cyberlearning challenges faced by those with disabilities.
- Upon certification participants can advance to Level 2 training and learn how to develop a fully accessible course and apply more advanced accessible cyberlearning techniques.

Level 1 Time Commitment

- 20 hours over 2-4 weeks, including 8 hours of face-to-face training, and approximately

12 hours of online and offline work to develop a basic accessible course.

- The online and offline work is flexible and can be completed 2-4 weeks after the initial training.

Level 2-Advanced Accessible Cyberteaching

Level 2 Learning Outcomes

- Apply Universal Design for Learning and best practices of online instructional design & development to create a pedagogically sound and fully accessible course for IDPP students.
- Demonstrate an advanced knowledge of challenges faced by those with disabilities.

Level 2 Structure & Assessment

- Training includes a synchronous and asynchronous learning component which contains 4 training modules.
- A self and peer assessment using the IDPP course evaluation rubric will be conducted prior to the final evaluation from the IDPP trainers to ensure participants have enough time to revise course prior to final submission.
- All courses will be evaluated using the IDPP course evaluation rubric and all courses must meet the certification requirements.

Level 2 Time Commitment

- 40 hours over 5 weeks, including online and offline work. The course is usually broken down into 5 phases with approximately 1 - 2 hours' work per day, but the timetable is flexible.
- Participants will have 3 months post the module training to complete the development of a fully accessible course.
- Midterm evaluations and consultations will be conducted to ensure participants are properly applying the advanced training in their course development.

Level 3-Accessible Cyberteaching Trainer

Level 3 Learning Outcomes

- Demonstrate mastery of iterative instructional design and development of accessible cyberlearning courses.
- Develop training modules for level 1 and provide (synchronous and asynchronous) professional development support to become a certified accessible cyberteacher trainer.

Level 3 Structure & Assessment

- Training includes synchronous and asynchronous learning that contains 4 training modules.
- Training includes one face-to-face two-day session on conducting effective and efficient face-to-face training. Participants will be expected to come prepared to demonstrate a 15-minute training session during the face-to-face session.

Level 3 Time Commitment

- 50 hours over 6 weeks, including online and offline work. The course is usually broken down into 5 phases with approximately 1 - 2 hours' work per day, but the timetable is flexible.
- Participants will have 4 months post the module and face-to-face training to complete the development of an exemplar (according to the IDPP course evaluation rubric) accessible course and level 1 training materials.
- Midterm evaluations and consultations will be conducted to ensure participants are properly applying the advanced training in their course development.
- Final trainer evaluation will be conducted upon submission of the exemplar accessible course.

6.2 Pre-Pilot Study Survey Results

In order to answer the second research question, a pre-evaluation survey was developed, focusing on Levels 1 & 2 on the Kirkpatrick model as well as to determine the participants' baseline knowledge and experience with accessible cyberlearning (both technical and pedagogical skills).

A pilot test of Level 1 of the ACT Model was implemented in February of 2014. Based on the results of this pilot, the ACT Model was revised and developed into a full, one-day ACT Workshop scheduled for August 2014. The ACT Workshop will be held using a blended approach (i.e. face-to-face/remote, synchronous/asynchronous). The outcome goals of the workshop are as follows:

- Outcome #1: Faculty will demonstrate targeted knowledge and skills in accessible cyberlearning facilitation techniques and Universal Design for Learning (UDL) principles as a result of certification training.
- Outcome #2: Faculty will indicate favorable attitudes towards the online training.

- **Outcome #3:** Faculty will report an increase in their perceived competence to provide accessible courses for their students.
- **Outcome #4:** Faculty will exhibit knowledge of challenges faced by those with disabilities in higher education, including in cyberlearning environments.

The following are the questions and responses:

1. In which contexts do you teach? (Choose all that apply)

#	Answer	Response	%
1	Face to Face	5	56
2	Online	3	33
3	Blended Learning (part online and part face to face)	2	22

2. How long have you been teaching on the graduate level?

#	Answer	Response	%
1	1-5 years	2	22
2	6-10 years	2	22
3	11-15 years	2	22
4	16-20 years	1	11
5	Over 20 years	2	22
Total		9	100
Mean		2.89/ 11-15 years	

3. How often do you have students with disabilities in your classes?

#	Answer	Response	%
1	Never	3	33
2	Rarely	2	22
3	Occasionally	2	22
4	Regularly	2	22
5	Often	0	
Total		9	100
Mean		2.33/ Rarely	

4. Have you ever been request to make specific accommodations for any students with disabilities in your class(es)?

#	Answer	Response	%
1	Yes	4	44%
2	No	5	56%
Total		9	100%
Mean		1.56/ No	

5. If YES, please briefly describe the type(s) of accommodation(s) you made?

Text Response
Hard of hearing UNESCAP Stakeholders meeting. December 16-18, 2011. Set up captioning system.
Classroom was requested to be on a level where student can have ramp access (for wheelchair).

Student visually impaired-during exam (semiotics) had to describe the visual before she could answer the questions.	
Captioning, ASL interpretations, screenreader	
Total responses	4

6. How knowledgeable are you about assistive technologies that help persons with disabilities (examples: screen readers, alternative keyboards, closed captioning, electronic pointing devices, wands and sticks, etc.)

#	Answer	Response	%
1	Not at all knowledgeable	4	40
2	Not very knowledgeable	3	30
3	Somewhat knowledgeable	1	10
4	Knowledgeable	1	10
5	Very knowledgeable	1	10
Total		10	100
Mean		2.20 Not very knowledgeable	

7. Please select any collaborative and/or social media tools that you use or would like to use in instruction? Choose all that apply.

#	Answer	Response	%
1	Google docs	5	50
2	Facebook	7	70
3	Twitter	4	40
4	Blogs	5	50
5	Tumblr	1	10
6	YouTube	7	70
7	Google Hangout	1	10
8	Skype	9	90
9	Dropbox	7	70
10	Other	0	0
Total		10	

8. How confident are you with using Moodle as a course development tool?

#	Answer	Response	%
1	Not at all confident (Never used Moodle)	6	60
2	Not very confident	2	20
3	Somewhat confident	2	20
4	Confident	0	0
5	Very Confident	0	0
Total		10	
Mean		1.60 Not very confident	

9. Please list any Moodle Tools with which you are familiar. If none, write NONE.

Text Response	
NONE (6 responses)	
Posting files, setting up questionnaires, running Turnitin for assignments online	
Total Responses	6

10. Have you ever used Blackboard Collaborate?

#	Answer	Response	%
1	Yes	9	90
2	No	1	10
Total		10	
Mean		1.10	Yes

11. Please list any learning management systems with which you are familiar (examples: Blackboard Learn, WebX, etc.).

Text Response	
None	
Blackboard Learn	
Pearson's online learning platform (forgot the name)	
Blackboard Collaborate, Blackboard Learn, Course Sites	
Total	4

12. How important is it that university faculty in the ASEAN region become proficient in accessible cyberteaching?

#	Answer	Response	%
1	Not at all important	0	0
2	Not very important	0	0
3	Somewhat important	1	10
4	Important	1	10
5	Extremely Important	8	80
Total		10	100
Mean		4.70	Important

13. [OPTIONAL] In terms of designing instruction, what do you feel are your strengths and what do you want to improve upon?

Text Response	
My strengths –I am creative and willing to learn and use new technologies. Improve upon – new technologies.	
How to use it more effectively.	
Strengths- don't know improve upon – knowledge of cyber learning technology.	
Total	3

6.3 Post-Pilot Training Focus Group Results

Instead of sending a post evaluation survey the researchers decided to conduct an informal focus

group immediately following the training session in order to provide just-in-time feedback and answer the third research question. The researcher asked the following questions:

1. Do you believe the learning outcomes were achieved?
2. What could have been done differently to enhance your learning experience?

While the participants responded positively to the first question, the researchers disagreed. The morning after the pilot ACT Workshop, the researchers met for an "After Action Review." This review included reflections on feedback received from the focus group interviews as well as each facilitator's personal reflection about how the trainings was executed vs. planned. The reflections are summarized as follows:

- The learning outcomes were not achieved fully.
- Participants were left confused and did not understand what was required of them to complete certification.
- There was not enough time to cover the material.
- The training was not implemented as designed.
- There were issues with the room configuration (e.g. not enough space for all participants and sporadic Wi-Fi connection) and the training had to be relocated causing a substantial delay.
- There was confusion between facilitators on the delivery and conduct of the workshop.

While interesting, these preliminary results do not answer fully Research Question 3; and this will be addressed in the data collection for August workshop. It was clear however, that the participants did understand the importance of accessible cyberteaching and learning and why it was important for not only them but other faculty members to become proficient in this pedagogical strategy.

7. Discussion

These preliminary findings suggested key improvements for the ACT Model and the implementation workshop. A critical component of good instructional design, whether the designer is an expert or novice (as are most faculty), is for the designer to consider the perspectives of their students as they plan and prepare materials and activities for their courses. When faculty members' students include persons with disabilities, designing instruction becomes even more challenging. In fact, in preparing materials and content for faculty for the next iteration of Level 1 training, the project team prepared video interviews with past online students with disabilities to share their perspectives on what works well for them in an online learning

environment. It was clear that the initial design provided the basic level pedagogical and technical training but the voice of actual students with disabilities was lacking. The revised ACT Model integrates the voice of real students throughout the training to ensure participants truly understand why accessible cyberteaching is important and how “All” students benefit from this accessible cyberlearning environment. The purpose of the ACT Model and its implementation and ongoing evaluation is to ensure that faculty with expertise in their respective disciplines can become accessible cyberteachers.

8. Limitations

Limitations of the pilot study include its small sample size. More importantly, the pilot study execution of the Level 1 training was flawed due to a number of factors that were addressed in the August training session. Perhaps, the most important realization was determining that a half-day training session for the face-to-face portion of Level 1 was grossly underestimated. It also limited the amount of interaction and hands-on time participants could have with the technology. The August training was structured as a full day of face-to-face training.

9. Conclusions and Recommendations

Designing and piloting the first model for teaching faculty in developed as well as developing regions of the world to design and implement accessible cyberteaching requires an understanding of universal design for learning as well as online learning and teaching. This model, along with its certification process, possesses significant potential for ensuring greater excellence in designing online teaching modules that serve all learners, not just those with disabilities. It meets the needs of an underserved population and provides learning opportunities for faculty teaching online as well as for the learners they serve. Additional research is needed to test for the model’s effectiveness both in terms of short term outcomes and longer term learning gains.

Additional research is needed on accessible cyberlearning and specifically on the evaluation of the three levels of the ACT Model. Specific research on cybertraining for faculty who themselves may have disabilities as well as for faculty to faculty learning in cybertraining is especially needed.

As the ACT Model is implemented to scale, it is imperative that the researchers ensure that iterative instructional design and evaluation are conducted to

improve the effectiveness and efficiency of the certification process.

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