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CHAPTER 3

Accessibility Frameworks and Models: Exploring the Potential for a Paradigm Shift

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Abstract The focus of this chapter is accessibility frameworks and models that have the potential to promote a paradigm shift whereby the design of ICT and related practices that ensure the needs of students with disabilities are fully addressed. In order to examine the potential of models and frameworks to bring about such a paradigm shift and transform practice this chapter will: (1) review common frameworks and associated models that influence the design and delivery of accessibility services, (2) discuss

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whether something other than (or in addition to) existing frameworks and associated models is needed in order to activate a paradigm shift toward more inclusive ICT and practices, and (3) discuss the implications for future research and practice.

Keywords ICT • Disability • Higher education • Accessibility • Models • Frameworks

COMMON FRAMEWORKS THAT INFLUENCE THE DESIGN OF ACCESSIBILITY SERVICES

While many commentators in the field use the terms model and framework interchangeably, we use the term “model” to refer to a practical or conceptual representation of systems and processes; in our case, those that are relevant to the provision and support of ICTs that contribute to successful educational and employment outcomes for students with disabilities. Models may describe existing practices (what is currently happening) or prescribe practices (what should be happening). “Frameworks” provide foundational elements (e.g., principles or assumptions) of a model. Adoption of frameworks and models on a campus can contribute to a “paradigm,” which refers to a widely accepted group of ideas about how something should be done or thought about as an organization routinely conducts business. The paradigm provides an almost unconscious, internalized way of thinking about how things should work, and what problems should be addressed. Common frameworks within higher education (HE) reflect different views of disability, accommodation, and inclusion.

“Medical” or “deficit” views of disability rely on a medical diagnosis and build on the assumption that the problems and difficulties that people with disabilities experience are a direct result of their individual physical, sensory, or cognitive impairments. As a response to this view, the major task of professionals is to adjust the individual (e.g., through surgery, medication, rehabilitation) or, at institutions of HE, provide accommodations that allow the person with a disability to access instruction and other campus offerings as much as is reasonable (Shakespeare, 1996). The locus of change is the individual. In contrast, in the “social” and related views of disability, barriers faced by people with disabilities are caused, to a large part, by the failure of designers of social, physical, and technological prod-

ucts and environments to take into account the needs of individuals with a wide range of abilities. The locus of change is mainstream products, environments, and related policies and social structures (Oliver, 1996; Shakespeare, 2010). Acceptance of this view has resulted in disability-related legislation in many countries requiring the accessible design of physical spaces including those in HE.

Disability service offices within HE institutions tend to rely on a medical view of disability, which can lead to an individualistic framework for service provision, where the focus is on determining the functional limitations of individuals with disabilities and then providing reasonable accommodations to facilitate their access to a facility, service, course, or technological resource. The provision of such services is typically dependent on the person with a disability securing a “diagnosis” of a disability by a recognized professional, providing a disability services office with documentation of the disability, and securing approval for reasonable accommodations. An accommodations-only framework for service delivery with respect to ICT can lead to a focus on providing assistive technology (AT) for specific individuals with disabilities, rather than on reducing accessibility barriers imposed by mainstream ICT. A framework that relies only or mainly on accommodations in institutions of HE today has been criticized for focusing only on the perceived “deficit” of an individual rather than looking to designing or redesigning educational products and environments to be more accessible to individuals with disabilities (Loewen & Pollard, 2010). Most proponents of the social view of disability in HE, however, recognize that sometimes there is still a need to provide accommodations to individuals in specific circumstances (e.g., sign language interpreters for students who are deaf attending lectures); suggesting that there is value in combining both frameworks, but where the social view of disability is more dominant or prevalent.

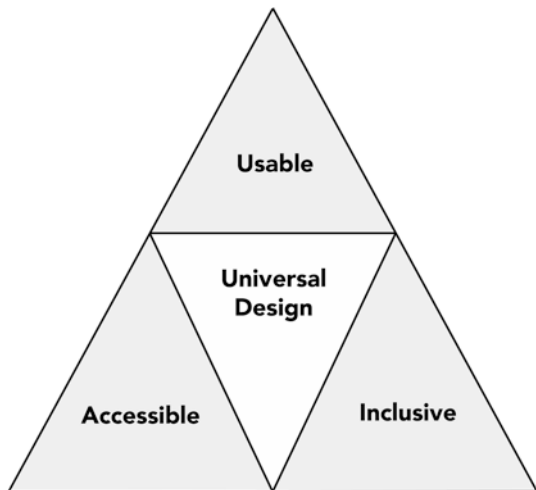
Universal Design: An Example of Combining Frameworks

One well-known approach to service provision that prioritizes social and related views of disability, while acknowledging accommodations may still be needed sometimes, is commonly labeled universal design (UD). UD is the general term, and other terms are used when it pertains to specific applications. For example, applications to teaching and learning have been referred to with labels that include Universal Design of Learning (UDL), Universal Design for Instruction, Universal Design of Instruction,

Universally Designed Instruction, Universally Designed Teaching, and Inclusive Design for Learning. These practices build on, to varying degrees, the work of the Center for Universal Design (CUD) at North Carolina State University, which defines UD as “the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design” (Center for Universal Design, 1997). Each approach has adopted principles for the design of inclusive practices. For example, the Centre for UD proposes seven principles that guide UD applications to products and environments (flexibility in use, simple and intuitive use, perceptible information, tolerance for error, low physical effort, and size and space for approach and use). The Centre for Applied Special Technology (CAST) proposes that teaching and learning practices apply three principles of UDL—multiple means of engagement, representation, and action and expression (Black, Weinberg, & Brodwin, 2015; Rose, Harbour, Johnston, Daley, & Abarbanell, 2006).

Common characteristics of any UD practice are accessibility, usability, and inclusiveness, as illustrated in Fig. 3.1. UD is positioned as inclusive because it values diversity, equity, and integration (Hockings, 2010). This approach provides a way to conceptualize these common characteristics as a routine part of the design of campus-wide applications rather than being

Fig. 3.1 Characteristics of a UD strategy: It is accessible, usable, and inclusive. (Burgstahler, 2015, p. 15)



considered as after-thoughts once an individual with a disability encounters a barrier (Burgstahler, 2015).

Universal Design in Higher Education (UDHE): A Specific Application of UD

The terminology: ‘Universal Design in Higher Education’ (UDHE) was adopted by a team of collaborators in several projects at the University of Washington (UW) that were funded by the US Department of Education (grants OPE #s P33A990042, P333AO20044, and P333A050064). UDHE builds upon a total of ten principles drawn from UD and UDL that allow for a wide range of possible applications in HE, not only in teaching and learning, but also in other functional areas such as outdoor spaces, administrative websites and services (Burgstahler, 2015). For all specific applications, the ultimate goal of these proactive practices is access for everyone. The UDHE Framework makes clear that applying UD and UDL principles campus-wide does not eradicate the need for accommodations; it minimizes their necessity and thus reduces the need for students with disabilities to make special requests for them (Hadley, 2011). As the two images presented in Fig. 3.2 illustrate, greater applications of UDHE (including those relevant to ICT) on a campus result in the provision of fewer accommodations (including the provision of AT).

The Disabilities, Opportunities, Internetworking and Technology (DO-IT) Center at the UW provides an example of how the UDHE

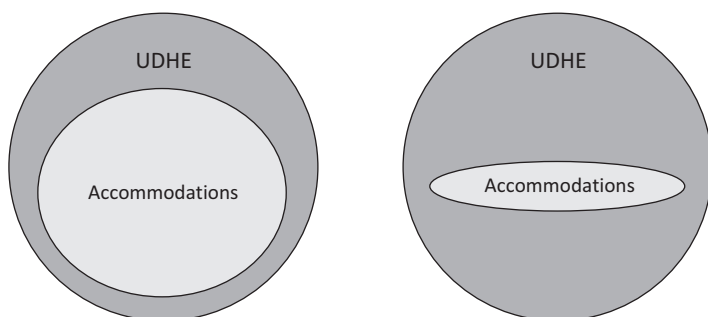


Fig. 3.2 Relationship of the level of access provided through UD versus accommodations of a campus that primarily embrace the accommodation framework compared to one that promotes UD

Framework can be applied to ICT in its process for the development and delivery of its collection of videos.¹ Its practices are designed to ensure the content of its videos are accessible to and usable by everyone. The website on which the DO-IT videos are hosted is fully accessible and the videos play on a custom accessible media player, developed by DO-IT staff, that allows full operation by people with a variety of disabilities. Each video is provided with closed captions, audio description, and transcripts, and can be downloaded, viewed on DO-IT's YouTube channel, or ordered on DVD. The Search Video Library feature enables users to search the full text of all videos and to begin playing videos at specific start times based on the search results. Most videos are accompanied by a brochure that includes content presented in the video, along with additional resources. UD and UDL principles are applied in all phases of the design process for each video. The amount of content that is not presented orally is minimized to reduce the need for audio description; for example, the credits, pointers to resources, acknowledgments, and copyright notices at the end of the video are spoken by the narrator and thus do not require the addition of audio description. Filming is done in anticipation of captioning by making certain that valuable visual content is not presented at the bottom of the screen.

*The Inclusive Campus Model: An Example of How a Framework
Can Underpin a Model*

At the first Ed-ICT symposium in Seattle, Sheryl Burgstahler described how a UDHE Framework underpins an Inclusive Campus Model. Dimensions of the UDHE Framework, as summarized in Fig. 3.3, include scope, definition, principles, guidelines, practices, and process.

If the scope of applications is all products and environments campus-wide, an institution might choose a definition slightly modified from the UD definition established by the CUD: The design of products and environments *in HE* to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design. The principles are the combination of the seven principles of UD established by the CUD and the three principles of UDL established by CAST, along with the four—perceivable, operable, understandable, and robust—that underpin the Web Content Accessibility Guidelines (WCAG) of the World Wide Web Consortium, an international community that develops open standards to ensure the long-term growth of the Web (World Wide Web Consortium, *n.d.*). From this

Fig. 3.3 Dimensions of a UDHE Framework

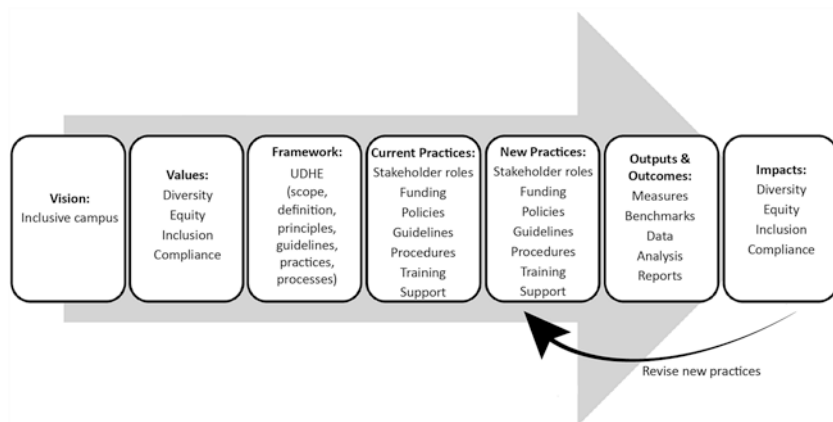
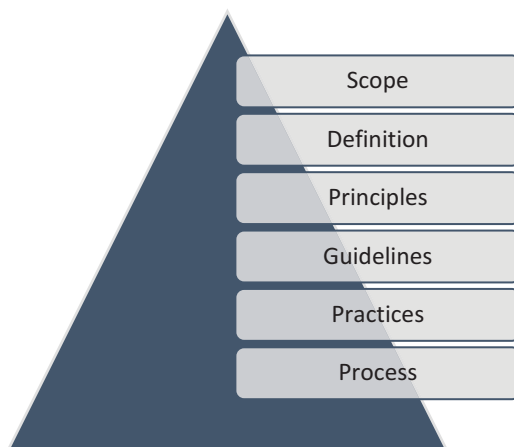


Fig. 3.4 Inclusive Campus Model underpinned by the UDHE Framework

foundation, a campus could adopt overall practices and processes designed to ensure accessibility, usability, and inclusion for all students and lead to a paradigm shift to a more inclusive campus.

This UDHE Framework underpins the remaining work and evaluation steps of the Inclusive Campus Model. As presented in Fig. 3.4, to further develop the Inclusive Campus Model, campus leaders representing multiple stakeholders at an institution can begin by reviewing their existing

institutional vision and values statements in order to determine if they reflect high values with respect to diversity, equity, inclusion, and compliance with the Americans with Disabilities legislation (United States Department of Justice, 1990) or if the statements should be adjusted to do so.

After fleshing out the UDHE Framework, the next two steps in applying the Inclusive Campus Model are to identify current practices and to describe new practices with respect to relevant issues that include stakeholder roles, funding, policies, guidelines, procedures, training, and support. Outputs and outcomes should be measured as new practices are put in place; tasks in this area include creating measures, collecting data, analyzing results, and producing reports. In addition, indicators should be identified that measure overall impacts of changes with respect to the established campus values of diversity, equity, inclusion, and compliance. Once the model is fully implemented, the institution can assure continuous improvement by fine tuning new practices and measuring outputs, outcomes, and impacts.

The Inclusive Campus Model can be adapted by campus leaders who wish to apply a set of principles that is *not* the collection of UD, UDL, and WCAG principles used in the basic UDHE Framework. For example, some practitioners embrace Universal Design for Instruction (UDI), an approach developed by the Centre on Postsecondary Education and Disability at the University of Connecticut (McGuire & Scott, 2006), that applies the basic seven UD principles along with two others, in order to make UD more applicable to instruction in HE. The Inclusive Campus Model can be modified for a campus committed to UDI by simply restricting the scope to include applications to instruction and the changing principles of UD, UDL, and WCAG to those of UDI in the Framework.

The UW employs the Inclusive Campus Model for ICT procured, developed, and used at the University. Much of the work of the Access Technology Center (ATC) promotes the proactive design and remediation of videos, documents, websites, commercial software, and other ICT to minimize the need for accommodations (UW, n.d.). In spite of these efforts, each academic term, the most expensive accommodations provided by Disability Resources for Students with respect to online learning are for remediating inaccessible documents and captioning videos (Burgstahler & Greear, 2017). The UW continues to make gradual steps toward focusing more on the accessibility of the products (e.g., websites) and environments (e.g., computer labs) and how ICT can be proactively

designed to be accessible to a broad audience. Nationwide, resolutions to the hundreds of lawsuits and civil right complaints brought to the Office of Civil Rights, the Department of Justice, and courts of law have promoted this approach, as legislation has required that associated institutions proactively design their websites, videos, documents, and other ICT to be accessible (Beaver, 2017; Sieben-Schneider & Hamilton-Brodie, 2016).

Anecdotal evidence gleaned from the Ed-ICT collaborative meetings, at conferences, and from reports in the literature suggests an increasing interest in UD, UDL, UDHE, or similar frameworks built on UD. For example, in the first Ed-ICT symposium in Seattle, Alice Havel presented another example of a framework that integrates medical and social models of disability, along with the addition of accommodations and universal design.² The Human Development Model-Disability Creation Process (HDM-DCP) is based on the work of Fougeyrollas (International Network on the Disability Creation Process, n.d.). This conceptual model, not well known outside Quebec, does not downplay the impact of an impairment itself and expounds that life skills are achieved not only by enhancing abilities and compensating for disabilities, but also by reducing environmental obstacles. It is similar to the International Classification of Impairments, Disabilities, and Handicaps published by the World Health Organization (World Health Organization, 2018), which is still used in some countries today. Although the HDM-DCP model, along with its classification system, is employed by many health, rehabilitation, and social service organizations in Quebec, it has had limited influence on HE. This may be due to a pragmatic reason: eligibility for government funding of disability services in colleges and universities is based exclusively on a medical model. In addition, the complexity of implementing the HDM-DCP model brings no obvious advantages for students, faculty, or service providers. For various reasons, mostly financial, government guidelines for service delivery strongly suggest a needs-based organizational model when determining accommodations, taking into account a student's strengths, abilities, and needs, while at the same time emphasizing the necessity to eliminate environmental barriers. In spite of the energy dedicated to developing a unique Quebec approach, due to the significant increase in the number of students with disabilities in HE, the prohibitive cost of psycho-educational assessments for diagnosing a learning disability and the desire for a more diverse and inclusive society, many service providers and a growing number of faculty are now seriously exploring the UD framework. Several

province-wide organizations have created websites to support this trend to implement UDL across French and English Quebec colleges and universities (CAPRES, 2015; Portail du réseau collégial du Québec, 2016; McGill University³).

Despite the increasing interest in UD or similar frameworks, the vast majority of campuses world-wide primarily adopt an accommodations-only framework in their designs of disability service offerings. Even when there are widely accepted guidelines, such as WCAG in the case of ICT, focus is on compliance (e.g., what do we need to do to be “ADA compliant”?) rather than moving beyond compliance and accommodations to embrace UD practices to ensure ICT is not just accessible, but also usable and inclusive.

DO WE NEED SOMETHING OTHER THAN (OR IN ADDITION TO) EXISTING FRAMEWORKS AND ASSOCIATED MODELS IN ORDER TO ACTIVATE A PARADIGM SHIFT TOWARD MORE INCLUSIVE ICT AND PRACTICES?

In the first Ed-ICT Symposium, Jane Seale (2017) proposed that existing frameworks and associated models might be replaced, or at least enriched, if they incorporated wider views of the HE context. She presented the results of a literature review that identified additional models that were considered relevant to the provision of ICT in HE, but which were currently widely ignored. She argued that the field might further progress if practitioners and researchers considered how aspects of models could contribute something beyond accommodations-only and UD frameworks for underpinning practices toward a stance that considers the possibility that best practices might emerge from combining a number of frameworks and models that take into account issues perhaps not yet widely considered. In this section, we briefly outline seven frameworks and models and contrast them to one another and to the Inclusive Campus Model (which is underpinned by a UDHE Framework) and share how additional views on accessibility—such as adaptability, integration and segregation, change agents, and holistic approaches—can inform future research and practice.

The Holistic Model of Accessibility for e-Learning Applications

Kelly, Phipps, and Swift (2004) proposed a holistic model for e-learning accessibility, which places the learner at the center of the development

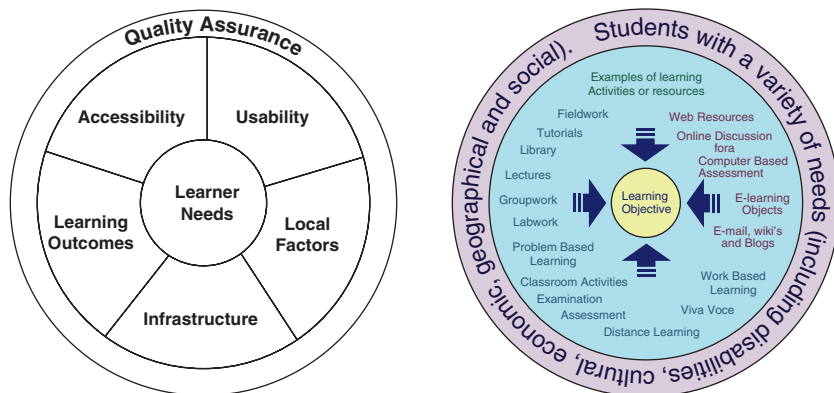


Fig. 3.5 Early and later versions of holistic model of e-learning accessibility

process, as indicated in Fig. 3.5. Positioning their model as an alternative to UD, they argue for solutions that are tailored to an individual's specific needs, institutional factors, subject discipline, and broader cultural and political factors. Kelly, Nevile, Draffan, and Fanou (2008) refine their model to argue that a learner-centric model replaces learner needs with learning objectives at the center. They also articulate in more detail the context in which this model might be useful by emphasizing that e-learning solutions need to take into account both online and offline learning activities and resources (blended learning). The holistic model appears to ignore the perspectives of stakeholders other than students as well as the inclusiveness consideration included in the UDHE Framework. Although it is designed for e-learning applications, this model may also be more generally applicable to ICT access.

The VIVID (Vision Impaired Using Virtual IT Discovery) Model for e-Learning Applications

Permvattana, Armstrong, and Murray (2013) also offer an alternative holistic model, one that they developed specifically for e-learning environments for the vision impaired, as illustrated in Fig. 3.6. The stimulus for this development was the argument that while models such as those proposed by Kelly et al. (2008) provide valuable input into the design of specialized e-learning environments for the vision impaired, they are open

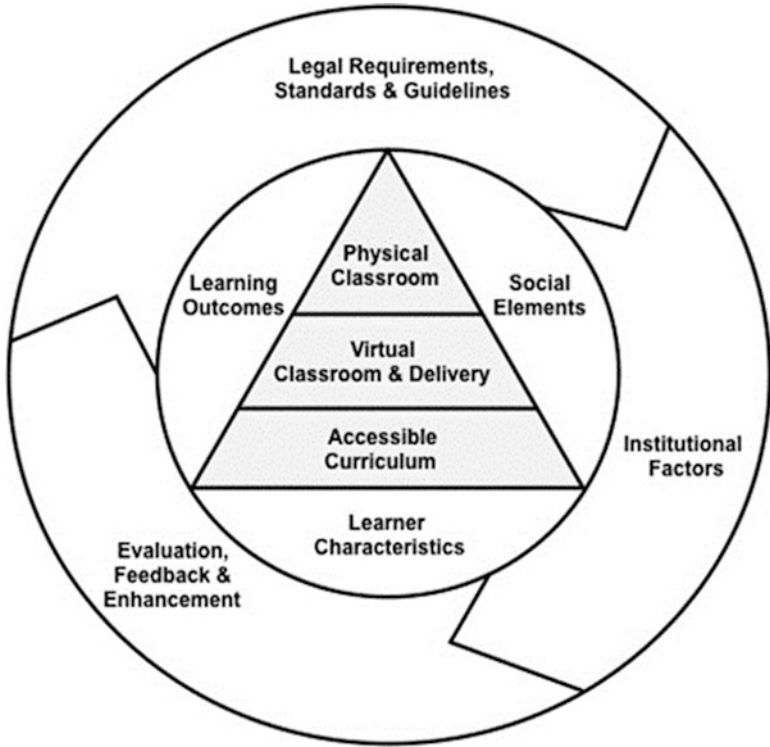


Fig. 3.6 The VIVID (Vision Impaired using Virtual IT Discovery) model

to too much “subjective interpretation” when applied in practice. They therefore attempted to provide a more detailed model, which they assert would make it easier to identify potential solutions to the access barriers commonly faced by vision impaired students. The model they propose is underpinned by insights gained from observations and interviews with vision impaired students and teachers. At the center of the model are the components or resources that need to be made accessible: the physical classroom, the virtual classroom, and the curriculum. Around this core is a layer of local factors that influence accessibility decisions: learning outcomes, learner characteristics, and social elements. The external layer of influencing factors or drivers includes legal requirements, standards, and

guidelines; institutional factors; and evaluation, feedback, and enhancement. While this model focuses on visual impairment, it appears to be adaptable for students with a wider range of characteristics.

The Composite Practice Model for AT Service Delivery

Disabled students do not just interact with faculty in physical or virtual classrooms. They often interact with ICT or access services personnel who support them to acquire and use ATs or other accommodations, and it would therefore make sense for models to exist that guide these processes. Leung et al. (1999) developed a composite model to describe and explain practice in regard to the AT service delivery in HE settings across Australia. There were three main components to the model: (1) policy funding, (2) the stakeholders, and (3) the process of assessing students for their AT needs. Leung et al. (1999) argued that this model can serve as a checklist for institutions in assessing their response to AT needs of students with disabilities. It recognizes that there are multiple factors to consider; that assessment for AT may involve a diagnostic evaluation; that there is a full range of available AT, from low tech to high tech, that varies in cost; and that there should be utilization of mainstream service provision whenever possible. While this model narrowly focuses on acquisition of AT, it highlights the contribution of a range of stakeholders including administrators, student services, librarians, ICT services, and AT specialists. In addition, like the Contextualized Model (see later section), the Composite Model acknowledges the powerful influence of external drivers such as policy and funding. Furthermore, although not clearly expressed, the model acknowledges that a cyclical process exists of eligibility, assessment, selection, training, and reassessment, which has the potential to be useful in a practice model of service delivery.

A Staff Development Model

The development of accessible practices within HE relies on faculty and other staff having the knowledge and skills necessary to change and improve what they do; therefore, staff development is an important element of accessible practice. For example, in 2011, while director of the Office for Students with Disabilities at McGill University in Montreal, Fovet and his colleagues led a whole-campus implementation drive to

apply UDL. His experience led him to conclude that “The model is often seen as a new concept, and this in itself creates resistance factors related to the management of change process.” (Fovet, Mole, Jarrett, & Syncox, 2014, p. 71) He found that resistance from faculty was the greatest barrier encountered as they were fearful of feeling less competent, anxious about the innovative use of ICT, and concerned about insufficient resources and time. One way to address such concerns was by providing pedagogical support through the Teaching and Learning Support Unit of the university. It therefore makes sense that models to guide the design and delivery of staff development initiatives could be incredibly valuable.

Papadopolous, Pearson, and Green (2012) proposed a provisional staff development model (they called it a framework, but we think a more accurate description would be model) for supporting academics to develop accessible and inclusive e-materials. There are four main elements to their framework, as illustrated in Fig. 3.7. The first they call framework components: raising awareness, enhancing understanding, and improving skills. The second element is the processes, which are required to raise awareness, enhance understanding, and improve skills. Thirdly, they proposed a training procedure comprised of two main elements: Accessibility Simulations and a Tutor Accessibility Support Kit (TASK). Finally, they argue that culture change within an institution will not occur without individual self-reflection and collaboration with others. Like other models, the staff development framework acknowledges the influence of external drivers such as legislation and internal drivers such as institutional or individual intentions. Unlike other models, it does not explicitly incorporate different stakeholders, nor does it position itself in relation to universal or accommodation approaches to accessibility. Although this framework is applied to instructional practices, it holds promise for guiding accessible ICT-related staff development on a campus.

A Model of Accessibility Services

The model of accessibility services attempts to describe how a range of services within an institution might support disabled students. Kouroupetroglou, Pino, and Kacorr (2011) propose a model of accessibility services that they argue takes into account both “Design for All” (a term used synonymously with UD) and “Individual Accommodation”

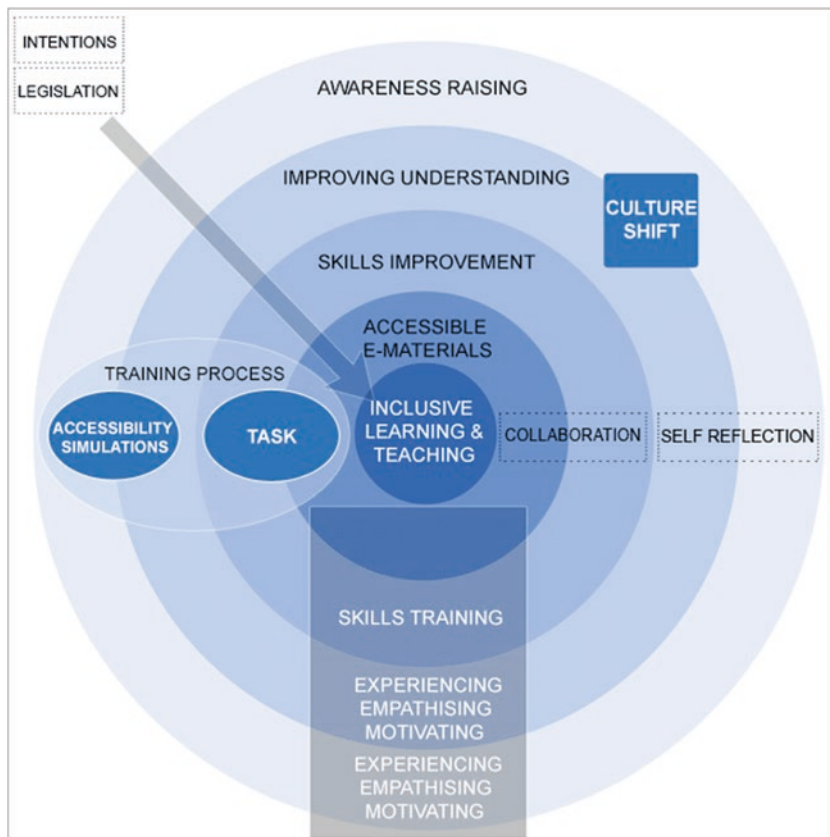


Fig. 3.7 A staff development model for inclusive learning design

approaches. However, they do not explicitly illustrate how the two approaches underpin their model. The main pillar of this model is the “Accessibility Unit,” which provides a number of supportive services, arranged in a three-tier architecture according to their “proximity” to the student: (1) accessibility services addressed directly to the student; (2) accessibility services applied to the student’s environment; and (3) accessibility promoting services which disseminate good accessibility practices in the university community and beyond. Like the contextualized model

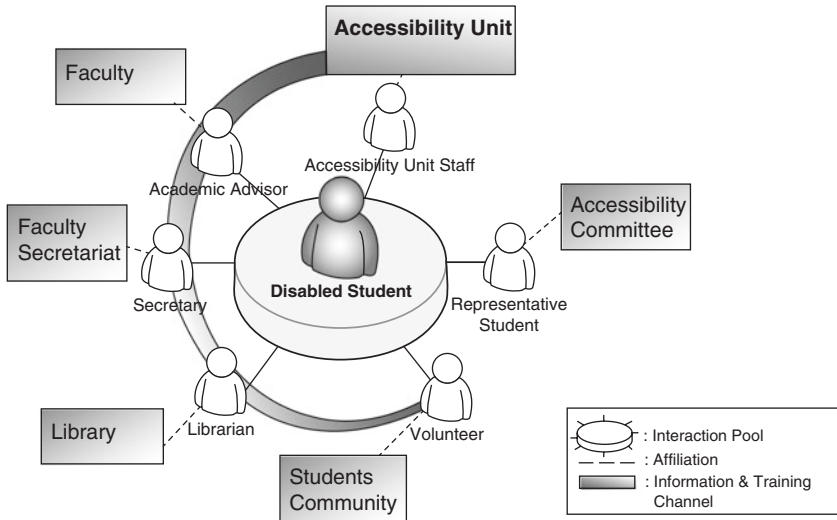


Fig. 3.8 The stakeholders who mediate the relationship between a student with a disability and an accessibility unit

of accessibility (see later section), this model seeks to identify the stakeholders who mediate the relationship between a student with disabilities and the different service providers: Academic advisors, librarians, student representatives, and so on (see Fig. 3.8). But, unlike the contextualized model of accessibility, Kouroupetoglou, Pino, and Kacorr have for several years implemented their model in practice in the Accessibility Unit of the University of Athens (The largest institution of HE in Greece). Although the model does not directly address ICT, its application in this area seems plausible.

A Contextualized Model of Accessible e-Learning Practice

Seale (2006) proposed a model of accessible e-learning practice that takes into account all relevant factors that mediate an institutional response to accessibility: the stakeholders, the context (drivers and mediators), and how the relationship between the stakeholders and the context influences the responses made and the accessibility practices

developed (see Fig. 1.1 in Chap. 1). While the model of accessibility services is descriptive, reflecting existing practice within one institution, the contextualized model is conceptual, that is, suggesting an ideal practice. This model stipulates that the extent to which e-learning material and resources are accessible will be influenced by how all the stakeholders within an institution respond to external drivers for accessibility such as legislation, guidelines, and standards. Unlike UD, this model does not take a stance on how a student's disability or learning needs should be perceived. Instead it argues that institutions' accessibility practices should be mediated by all stakeholders' views and understanding of disability, accessibility, and inclusion; duty and responsibility; autonomy and freedom; and teamwork and community. The accessibility practices that develop out of these responses vary, depending on the stakeholders and the context in which they are operating, but they essentially depend on stakeholders taking ownership and control as well as developing personal meaning from externally imposed mandates. As with other models already discussed, although broadly applied to disability services, the contextualized model of accessible e-learning practice also holds promise specifically for ICT practice.

The EU4ALL Model

The EU4ALL model (the authors called it a framework, but we think a more accurate description would be model) emerged from a four-year European project that developed a general model to address the needs of accessible lifelong learning in HE. It consists of several standards-based interoperable components integrated into an open web service architecture aimed at supporting adapted interaction to guarantee students' accessibility needs (Boticario et al. 2012). The model aims to (1) enhance the learning experience, by presenting learning materials that are appropriate for and matched to modality and end-user device preferences, such as mobile devices or a desktop computer, perhaps with AT; and (2) provide a wide range of services that an institution can adopt to ensure that the needs of learners who have disabilities are most appropriately supported. Conceptually, the EU4ALL model does not explicitly take a position regarding conceptual views of disability, but it claims to go beyond typical UD and UDL practices where designs anticipate the needs of a broad

range of users and strive to meet these needs. The EU4ALL approach aims to adapt or customize digital resources for students at the point of delivery (e.g., through a virtual learning environment so that offerings meet a student’s exact needs).

Through a study of different organizations and interviews with key stakeholder groups across Europe, the EU4ALL team identified a broad ontology of services that they suggest as a conceptual map or presentation of ideal institutional processes, which has the potential to inform the creation of new services. This conceptual map underpins the technical or practical aspects in which existing standards are used to define and implement an open and extensible architecture of services for Accessible Lifelong Learning as illustrated in Fig. 3.9. Like the contextualized model, the EU4ALL model emphasizes the involvement and co-operation of a number of different stakeholders.

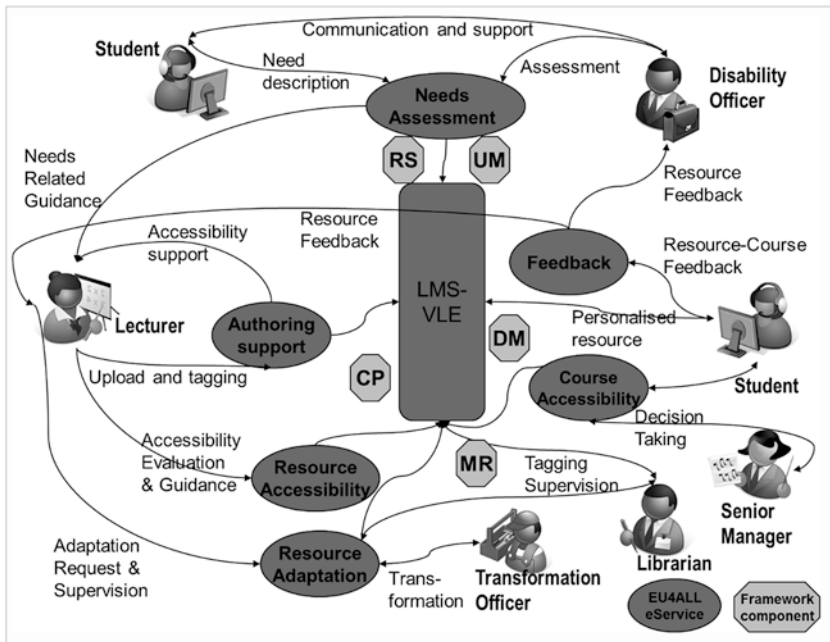


Fig. 3.9 The EU4ALL model

An Overview of the Characteristics and Potential of Accessibility Models Presented

To help practitioners decide which of the models might be potentially more useful or relevant than others in certain practice contexts, in this section we offer a comparative overview of the models focusing on what they have to say about approaches to access (Table 3.1a); engagement, change, and responsibility (Table 3.1b); and approaches to ICT support, student support, and stakeholder engagement (Table 3.1c).

IMPLICATIONS FOR FUTURE RESEARCH AND PRACTICE

In this chapter, we have examined the potential of models and frameworks to bring a paradigm shift toward more inclusive practices in HE institutions. In this section, we will discuss the implications of implementing any or all of these models in practice and how research might contribute to such implementation.

Table 3.1a Comparing the nine models based on their approach to access

<i>Characteristic</i>	<i>Options</i>	<i>Models that incorporate option in part or whole</i>
Approaches to access	Accommodation for specific students	Composite Practice Model Model of Accessibility Services Inclusive Campus Model
	Adaptability	EU4All Model Holistic Model Inclusive Campus Model
	UD (that maximizes adaptability and includes but minimizes need for accommodations)	Inclusive Campus Model Staff Development Model
	Segregation, (i.e., having students with disabilities do something different than other students)	VIVID
	Mainstream, engaging students with and without disabilities together	Contextualized Model Holistic Model EU4All Model Inclusive Campus Model Model of Accessibility Services

Table 3.1b Comparing the nine models based on their views of engagement, responsibility, and change

<i>Characteristic</i>	<i>Options</i>	<i>Models that incorporate option in part or whole</i>
Views of engagement	Atomistic, specific parts of an institution	Composite Practice Model
	Holistic, the whole institution	Contextualized Model EU4All Model Inclusive Campus Model Model of Accessibility Services
Views on who is responsible for accessibility	Requires leadership	Inclusive Campus Model
	Requires staff development	Inclusive Campus Model Staff Development Model
	Disability service unit(s)	Composite Practice Model Holistic Model EU4ALL Model Model of Accessibility Services
	All campus faculty and service providers	Contextualized Model EU4ALL Model Inclusive Campus Model Model of Accessibility Services
Views of change	Builds on campus vision and values; is underpinned by a comprehensive framework (UDHE); requires leadership, involves and supports many stakeholders; requires development of policies, guidelines, and practices; measures results; and ensures continuous improvements	Inclusive Campus Model

Table 3.1c Comparing the nine models based on ICT support, student support, and stakeholder engagement

<i>Characteristic</i>	<i>Options</i>	<i>Models that incorporate option in part or whole</i>
ICT supported	All	EU4ALL Model Inclusive Campus Model
	Only ICT used in e-learning	Contextualized Model Holistic Model VIVID Model
	Only assistive technology	Composite Practice Model Model of Accessibility Services
Types of students supported	All students	EU4ALL Model Holistic Model Inclusive Campus Model Staff Development Model
	Only students with disabilities	Contextualized Model Model of Accessibility Services
	Only students with visual impairments	VIVID Model
Campus stakeholders engaged	All	Contextualized Model EU4ALL Model Inclusive Campus Model Model of Accessibility Services
	Disability service units only E-learning course instructors and developers only	Composite Practice Model Holistic Model VIVID Model

What Approaches to Implementing Accessibility Models and Frameworks Are Required?

Practitioners are cautioned to be careful about only partially applying a framework or model. For example, Thomson, Fichten, Budd, Havel, and Asuncion (2015) provide the example that, within the UDL model, “offering students a video as an alternative to text provides multiple means of representation but will not provide full access for a student who is deaf, unless the video is captioned” (p. 277). And, written content will not be available to a student who is blind or has a reading-related disability unless the text provided is in an accessible format. In summary, besides offering multiple ways to gain access to content, practitioners should ensure that each individual option is universally designed, so that it is also accessible,

usable, and inclusive. In addition, it is wise for stakeholders who implement models to check that their actual practices and procedures are in line with those intended by their chosen models. For example, in 2013, a UD audit was conducted on a large Canadian campus where a disability service unit decided to impose the UD lens on its own service provision (Beck, Diaz del Castillo, Fovet, Mole, & Noga, 2014). They selected this model as the university had recently participated in a broad campus-wide drive to implement UDL in teaching practices. However, as a service unit, the staff were increasingly concerned with a disparity between their external campus message of promoting UD and their actual internal practices. For example, although they encouraged the use of online tools at the time of audit, they still relied heavily on paper-based procedures and offered no alternative to in-person appointments.

Finally, it is important to acknowledge that the frameworks and models that have been described in this chapter probably do not capture all stakeholder views and the respective roles necessary to bring about a significant transformation in accessibility practice. For example, participants at the Ed-ICT symposium on “Effective Models, Frameworks and Approaches” in Seattle (University of Washington, 2017) concluded that it was important to adopt both top-down and bottom-up approaches to practice, where “top” is associated with legislators, managers, and leaders, while “bottom” is associated with stakeholders that work more closely with students, such as in a disability services office. At the Ed-ICT Montreal Symposium on Stakeholder Perspectives (Jorgensen, Fichten, King, & Havel, 2018), government officials, although invited, were noticeably absent. During discussions, some participants also commented that some senior administrators are not easily convinced to take on leadership roles when it came to ICT accessibility. To facilitate a paradigm shift toward more inclusive campuses, the models adopted by an institution need to clearly incorporate roles for those stakeholders who have the influence to bring about changes and be persistent in seeking their engagement.

A review of the frameworks and models reveal specific aspects related to accessible ICT and related practices that practitioners may find it helpful to consider as they embrace a model that best fits their campus. It is our claim that practitioners would potentially benefit from considering the following factors:

- The strengths and weaknesses of each model
- Campus values and culture

- Views of stakeholder representatives (e.g., on integration and segregation, duty and responsibility, teams and community, autonomy and freedom)
- Implementation of a process to reach a shared vision
- Potential roles of a large number of stakeholder groups
- Application of holistic practices
- Processes for acquiring AT as well as the procurement, development, and use of accessible mainstream IT
- External drivers and mediators to change
- Training and support issues, tailored to specific audiences and to efforts to promote awareness and increase specific knowledge, skills, and procedures
- Potential barriers or resistance factors (e.g., funding)
- Culture changes and a paradigm shift to a more inclusive campus
- Development of strategic partnerships and implementation plans
- Benchmarks to measure progress toward a vision of a more inclusive campus with respect to ICT

How Can Research Help to Measure the Success of Any Paradigm Shift?

In preparation for the first symposium of the Ed-ICT International Network, Seale (2017) developed a list of questions that she suggested should be asked to evaluate the potential of the range of models that exist in the field of disability, ICT, and HE. She argued that it is important to examine both the validity and efficacy of models for the purpose of developing informed practice.

The validity of models can be judged based on whether or not they are logical, factually sound, and convincing. This involves examining how the models are derived, as well as looking for evidence that the models have a positive impact on practice and outcome. In evaluating the efficacy of the models, she proposed that two components be addressed: the level of details within the model and how widely a model is being implemented. She presented her findings based on her literature review of nine selected models and the application of her framework of questions. As there is a dearth of critical analyses of models, additional research is warranted. This could entail others using the same framework of questions, to replicate Seale's research from their unique perspectives. As well, there may be

future opportunities to examine models other than those already studied, but again applying the same criteria regarding validity and efficacy.

If the common goal of the models we have examined is to facilitate the successful inclusion of disabled students in HE through provision of accessible and inclusive ICTs, an obvious research question to ask is whether any of the models actually accomplish this? Mole (2013, p. 76), in her examination of UD as a model for inclusion of disabled students in HE settings, concludes that “Despite the emerging popularity of UD with disability service provision, there is a notable lack of research with regards to outcomes for stakeholders.” The same can be said for any of the models presented here. In conducting further research, the first challenge would be to define indicators of successful inclusion of disabled students, followed by identifying the means by which to measure them. Should one be looking at retention/graduation rates of students, the competency levels of students’ ICT use, a reduction in the need for accommodations, student satisfaction, and so on? Some stakeholders may have a very different perspective in terms of efficacy. For example, senior administrators of an institution may be interested in what impact a model has on the financial and human resources required to sustain the provision of accessible and inclusive ICTs. In other words, the question for future research needs to revolve around “which model work best for which stakeholder”?

According to Radermacher (2006, p. 23) “Engaging in a participatory action research approach can provide a practical way in which to embrace a social model of disability.” It can easily be rationalized that it also provides an excellent approach to further examine other models that relate to disability. This might be particularly true if the largest participant group were composed of students with disabilities who are ICT users and who could benefit the most from the findings. Seale (2017) has already expressed concern about researchers and practitioners who have been critically silent by either criticizing other models in a superficial way, or by focusing only on the strengths and not the weaknesses of their preferred model. Students in HE, who are unlikely to hold such biases, are ideally positioned to participate in the whole research process, from selecting the models to be studied, setting the research questions, gathering and analyzing the data, and most importantly, advocating that the research findings be implemented in practice.

CONCLUSION

In this chapter, we discussed various approaches to accessibility practices in institutions of HE that might promote a paradigm shift to a more inclusive campus, especially with respect to the procurement, development, and use of ICT. We also made the case for the benefits of exploring a variety of potential frameworks and models for service provision and perhaps even combining them to best fit a specific institution, where the selection is informed by views of disability, accessibility, inclusion, responsibility, and change. And, of course, selection of frameworks or models will not instigate a paradigm shift unless they are actually implemented and evaluated in practice.

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NOTES

1. <https://www.washington.edu/doit/videos/>
2. <http://ed-ict.com/workshops/seattle/programme/>
3. <https://alludl.ca/>

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