A Needs Assessment of the Accessibility of Distance Education in the California Community College System

Part I

AUGUST 2008

Beverly Farr, Ph.D.
Carol Studier, M.A.
Laurel Sipes, M.P.P.
Norman Coombs, Ph.D.

MPR Associates, Inc.

Table of Contents

PAGE

List of Tables

I. Introduction

If distance education was once the wave of the future, it is now here to stay and is improving rapidly. As technology advances—providing more opportunities for people to access material from almost anywhere on various devices in any number of formats—distance education is becoming increasingly complex. While the opportunity for students to take classes at any time of day or night provides a great convenience for those enrolled, it also presents a new range of challenges for instructors. They have more options than ever before for presenting material in an engaging format.

These advances in technology, however, must benefit anyone enrolling in distance education (DE) courses—including students with disabilities. People with disabilities are entering college in increasing numbers (Henderson, 2001; National Council on Disability, 2000). In fact, the largest and fastest growing group of students who are enrolling are those with learning disabilities (Henderson, 2001). Once enrolled, students with disabilities are also, unfortunately, less likely to persist, make transitions from 2- to 4-year institutions, earn degrees, and secure employment (Horn & Bobbitt, 1999; National Council on Disability, 2000; Blackorby & Wagner, 1996; Yelin & Katz, 1994). The latter is particularly important because the association between level of education and rate of employment is stronger for those with disabilities than for the general population (Burgstahler, 2007). As course delivery for distance education improves, the moral and legal obligation that campuses have to make the material accessible to all students remains the same: students with disabilities need the same opportunities as other students to learn course material and to succeed in these courses. But various factors hinder campuses in making DE courses accessible. In some situations, instructors lack the support and skills needed to design accessible course materials. In other cases, the course approval process lacks efficiency and fails to identify courses that are inaccessible before they become active. In still other cases, students are not offered the training, tools, and support needed to succeed in online courses.

Federal legislation requires that postsecondary institutions provide reasonable accommodations to ensure equal access to program offerings for students who disclose their disabilities and present appropriate documentation (Frank & Wade, 1993; West et al., 1993; Waddell, 1999). The Office of Civil Rights in the Department of Education has compared providing access to information through adaptive computer technology to the need to provide ramps on buildings in order to provide access for students with mobility impairments. “The magnitude of the task public entities now face in developing systems for becoming accessible to individuals with disabilities . . . is comparable to the task previously

undertaken in developing a process by which buildings were to be brought up to specific architectural standards for access" (Coombs, 2002).

Burgstahler (2005, p.2) points out, however, "When the range of characteristics of potential students and instructors is considered and universal design principles are applied, all students and instructors can fully participate…Universal design is simply good, flexible design." Despite this assertion, applying principles of universal design or particular strategies to ensure accessibility requires serious attention—policies, training, and funding. A new bill recently introduced in the U.S. Congress[1] is an example of the attention needed to address this issue more generally: "Now we're full-blown into this digital era, and we, in general, need to upgrade the laws that ensure that there is accessibility for all the people who use these new technologies," noted Rep. Edward Markey, chairman of the House Subcommittee on Telecommunications and the Internet (Hart, 2008). While there has been much ballyhoo over the "digital divide" as the use of computers and the Internet has increased over the last couple decades, some ignore the fact that people with disabilities are also on the "other side of the divide," and the ability of information technology to radically inform and empower them is greater than for any other population. As colleges increasingly integrate information technology, they can create a more level playing field for students with disabilities, but not if they fail to integrate necessary design principles to ensure access (Coombs, 2002).

This report, commissioned by the California Community Colleges System Office, is Part I of a systemwide needs assessment of the accessibility of online distance education. The report focuses on Web-based courses because this delivery method has increased exponentially in popularity and now accounts for 82% of all DE courses (CCCSO, 2008). (Video-based telecourses, computer-assisted instruction, correspondence courses, and other DE formats are still offered but in far fewer numbers than Web-based courses.)

Part I of the needs assessment, represented here, provides information on how many Web-based courses at California community colleges are currently accessible and what helps or hinders campuses in making all online courses accessible.

Part II, a report to be completed later in 2008, will provide a deeper look at practices used to make courses accessible and a cost analysis on the initial and ongoing costs associated with ensuring accessibility. This information will be collected through a series of site visits and in-depth interviews with key informants.

---

[1] Bill introduced by Rep. Edward J. Markey, chairman of the House Subcommittee on Telecommunications and the Internet.

Background

Rapid Growth of Distance Education in Colleges and Universities

The Instructional Technology Council (ITC) conducts an annual survey on community colleges and distance education, and in April 2008, they released the results of the 2007 survey. Compared to a 15 percent increase for DE enrollments in the 2006 survey (covering fall 2004 to fall 2005), they reported an 18 percent increase from fall 2005 to fall 2006. Student demand also continues to grow. The Sloan Foundation found in its 2007 survey that the 9.7 percent growth rate for online enrollments far exceeds the 1.5 percent growth rate of students in the overall higher education population. Almost 3.5 million students were taking at least one online course during the fall 2006 term (representing 20 percent of U.S. higher education students), a nearly 10 percent increase over the number reported the previous year. (See www.sloan c.org/publications/survey/pdf/online_nation.pdf.) The results of the ITC survey also indicated that student demand exceeds class offerings and that administrators consistently identify obtaining the support staff needed for training and technical assistance as the greatest challenge they face in providing a DE program.

Status of Distance Education in California Community Colleges

The popularity of DE courses has gained steadily over the past decade in California community colleges as well. Comparing data from 1997–98 to 2006–07, gathered by the California Community Colleges (CCC) system, the total number of DE courses increased from 1,257 to 7,659, and the number of DE course sections offered, also an indication of demand, rose from 3,304 to 24,391 systemwide. Distance education courses represented 1.5% of all CCC courses offered in 1997–98 and increased to 8.5% in 2006–07; DE course sections increased from 1% to 6% of all sections offered over the same period. Ninety-nine CCC campuses offered DE courses in 2006–07, whereas in 1997–98 only 76 did. And in 2005-06 at least 21campuses offered full degree or certificate programs through distance education (Nather, 2007).

Similarly, as the number of courses and course sections offered increased, so too did the number of students enrolled in DE courses, from 118,295 in 1997–98 to 738,922 in 2006–07. As a share of total enrollment, DE enrollment grew from 1% to 7%. In parallel, the number of students with disabilities enrolled in those courses increased from 3,366 to 19,293 over that 10-year period. As a percentage of all students enrolled in distance education, students with disabilities remained at a constant 3% from 1997–98 to 2006–07.

Students with Disabilities Taking Distance Education

Students with physical or visual impairments in particular might find DE courses even more convenient than the general student population does, because these courses can be taken

from home. This may save them from managing the transportation and logistics required to get to on-campus courses. Those with learning disabilities might find they learn better through DE courses because they can review lectures repeatedly, whereas in on-campus courses, they cannot. Still other students with disabilities may be working to put themselves through college or have other family or health obligations that make it easier to access lectures at a time of their choosing—just as many students without disabilities do.

Regardless of their reasons for wanting to take a DE course, students with disabilities are indeed interested in taking them and are doing so in increasing numbers. Their participation requires not only that instructors make the material accessible to them, but also that students themselves have the proper tools and accommodations to succeed in these courses. For example:

A student with a visual impairment may use a screen reader that verbalizes what appears in writing on the computer screen. However, if an instructor does not label the columns and rows in a chart, the screen reader cannot translate that information, leaving the student at a disadvantage for understanding the material.

A student with a hearing impairment may be able to watch a video shown on the Web, but if the soundtrack has not been captioned, the student will find it difficult to understand the material.

A student with attention deficit disorder with an accommodation allowing him or her more time to complete an exam may have difficulty doing so if the instructor does not provide a way for the student to request and be granted that extra time online.

The challenges described above range from simple to complex in what campuses need to do to make distance education accessible. Some enhancements are inexpensive; others are more costly. But all are needed if all students are to be able to access DE course material.

As when retrofitting older buildings or designing newer ones with the needs of persons with disabilities in mind, many have emphasized that it is less expensive to design accessible buildings (or accessible courses) when adaptations are considered up front. Furthermore, as one former DE instructor and accessibility expert, Norman Coombs, sums it up, features like curb cuts designed to help people in wheelchairs have made sidewalks more accessible for everyone—mothers with strollers, bicycle riders, and workers pushing carts. This principle, known as "Universal Design," holds that accessible design for technology-based education benefits all users.

Universal Design is defined by the Center for Universal Design at North Carolina State University 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" (Burgstahler,

2004). Practically speaking, making Web applications flexible, accessible, and adaptable in their design benefits all users, in much the same way that curb cuts benefit a wide array of sidewalk travelers. For example, while all students will benefit from clear language and simple navigation, these features are particularly helpful for those for whom English is a second language (as they are crucial for those with disabilities). In addition, consideration of universal design in the development of DE courses minimizes the "retrofitting" costs associated with making existing courses accessible to students with disabilities.

Legal Requirements for Making Courses Accessible

Making courses accessible from the start is not just more cost effective, and the right thing to do—giving all students access to courses that can help prepare them for productive careers or further education—but it is also required legally. The California community colleges are required under various laws to provide an equal opportunity for those with disabilities to participate in courses as compared to those without disabilities. This mandate was first detailed in 1973, section 504 of the federal *Rehabilitation Act* and later, in 1990, in *Title II of the Americans with Disabilities Act*. However, in 1998, when the federal Office of Civil Rights (OCR) presented Title II statewide compliance review results, it stated that in the California community colleges, "[l]ittle attention is being given to ensure that these distance learning programs are accessible to students with disabilities, especially students with visual impairments."

In its recommendations, OCR cited the need for systemwide access guidelines for distance education. The resulting 1999 *Distance Education: Access Guidelines for Students with Disabilities* outlined the legal obligations of California community colleges to provide equally effective access to technology-based instruction for students with disabilities, as required by Section 504 and Title II. The guidelines also acknowledged that distance learning for students with disabilities must be timely in its delivery, accurate in its translation, and appropriate to both instructional goals and learner needs. Most importantly, the guidelines provided practical suggestions and resources for colleges to use in developing accessible distance education. For the past 8 years, the California guidelines have been widely referred to and seem to serve as a model for other states, universities, and community college systems.

The CCC system has embraced its moral and legal obligation to ensure that distance education is highly accessible to students with disabilities regardless of cost or burden. Statewide resources support these efforts. In addition to the Disabled Students Programs and Services (DSP&S) Department, the California High Tech Center Training Unit (HTCTU) provides state-of-the-art training and support for community college faculty and staff wishing to acquire or improve their teaching skills, methods, and pedagogy in Assistive Computer Technology, Alternate Media and Web Accessibility. The HTCTU supports 114

community colleges and satellite centers, and by all reports, it provides excellent faculty and staff training on accessibility in regional face-to-face settings.

Making Online Courses Accessible

Various elements make Web-based courses accessible to all, but two pieces play the biggest part: Web-delivery systems and the course content itself. Online courses are typically offered through Web-based delivery systems, such as Blackboard, WebCT (now merged), Moodle, or Etudes, into which an instructor loads course material. When a student logs on to the course, these systems allow them to "chat" on the site, take quizzes or tests, and access course calendars, lectures, lessons, homework, and other resources. These systems vary considerably in terms of the availability of some features, such as chat and white board accessibility. Colleges are responsible for selecting a delivery system that meets accessibility needs as well as the campuses' more general needs.

Some delivery systems are more accessible than others in that they provide a better interface with the assistive computer technologies that students with disabilities use. (An example of an assistive technology is a screen reader such as JAWS, which narrates what is on the computer screen for a student who is visually impaired, or another is a captioning program such as Dragon NaturallySpeaking, which turns speech into written text on the computer.) Not only does the course delivery system need to integrate with assistive technologies, but students with disabilities also need to acquire skill in using such systems. Colleges then are responsible for selecting a delivery system that best meets accessibility needs in addition to the campuses' other more general needs. Whether colleges are responsible for ensuring that students have the skills needed to operate such systems is somewhat unclear. While they have a legal obligation to train students on any special software used on campus, this issue has never been addressed for students taking off-campus, DE classes. Whether an obligation or not, however, colleges should be aware of the need if they are concerned with student success.

In addition to ensuring that course delivery systems are accessible, the course material itself must be accessible to students. To present content, faculty develop materials such as graphs or tables, a video, PowerPoint presentations, podcasts, images, or other elements. These tools are then loaded into a Web-delivery system. Though faculty are typically responsible for making the content of a course accessible, they are often supported by Web accessibility experts and are guided through training sessions that make them aware of how content can be reformatted to be accessible to all students. Web accessibility software can also review course content and alert the instructor or other college staff if the material could be made more accessible (Brown, et al).

The federal Section 508 standards outline 16 key components for making electronic and information technology accessible to people with disabilities. These specific examples guide community colleges in ensuring they have made their DE courses accessible. Some examples of the Section 508 components include the following:

- Nontext elements are described in text. For example, a picture of an apple is also labeled "apple" so visually impaired students using a screen reader will know what visuals are present.
- Alternatives for multimedia presentations are offered and synchronized. For example, for the hearing impaired, narration is translated into text that can be read through captioning. For the visually impaired, narration or text describes the visual images in the presentation.
- Web pages are designed so that all information conveyed with color is also available without color. For example, if a pie chart is shown using colors, labels should also be present so the visually impaired can understand the chart through a screen reader.
- Web pages are designed to avoid causing the screen to flicker. For example, a change in flicker frequency allows those with neurological problems to view the pages with a minimized chance of a trigger for a seizure, migraine, or other incident.
- For timed assignments or tests, users are given the opportunity to indicate that they need more time. For example, those with learning disabilities can master the material if they are given extra time, but Web courses must offer that option for them to take advantage of that accommodation.

Purpose of the Study

The goal of this needs assessment is to provide the CCC System Office and the DSP&S Office with more information to help them better support all campuses in providing DE courses that are accessible to all students. Everyone benefits when students with disabilities can access material because more education helps students secure better paying jobs in which they can contribute to their communities. Curtailing access to course material deprives students of the full experience of the course. In addition to these civic and moral issues, ensuring accessibility is a legal issue. These two reports will help the state assess how well it is meeting state and federal code and determine what it can do to assist campuses in better meeting those requirements.

As described in the Introduction, this Part I report provides data and information about the accessibility of distance education—including information on the status of the accessibility of Web-based courses, the ways campuses are ensuring that courses are accessible, and issues that prevent them from doing so. The research questions guiding this report include the following:

1. What is the current status of DE offerings in the California Community College (CCC) System? How many courses are currently being offered? How many new courses are

being developed? How many students are participating in distance learning? How many students with disabilities are participating?

2. What is the process for the development of a new online course? How and when are accessibility needs addressed? Who is responsible for addressing these needs? Is universal design used in the development of new courses?
3. What types of support are available to faculty in the development of new online courses? How do faculty navigate both curriculum development and approval and technology needs?
4. What is the process for reviewing and maintaining accessibility in existing online courses? Who is responsible for ensuring that existing online courses stay current with developments in Web design and assistive technology?
5. What are the barriers to making online courses accessible? At the system level? At the college level? For instructors?
6. Is cost in particular a barrier to making DE courses accessible? Which features add the most to the cost of making these courses accessible? Which sources provide funding to make DE courses accessible? (The Part II report will investigate these cost issues in more depth.)

II. Methods

Survey Development

Three online surveys provided most of the data for this first part of the needs assessment. These surveys were intended to collect more specific information from 1) students with disabilities who had participated or contemplated participating in distance education (DE) courses; 2) faculty who had developed DE courses; and 3) DE and Disabled Students Programs and Services (DSP&S) coordinators. In some cases, administrators felt someone else on their campus was better prepared to complete the survey, and they may have forwarded it to technology or academic services staff. (For ease of reporting, we refer to these respondents as "administrators" throughout the report.)

MPR used various information sources to develop and refine these tools, including informal conversations with site-based DE and DSP&S staff and faculty, relevant statutes and state guidelines, literature on distance education and accessibility, expertise from Norman Coombs (a veteran DE instructor and accessibility expert), and feedback from the CCC System Office. We discussed past DE surveys with researchers or administrators at Cornell University ILR School Employment and Disability Institute, the California State University Academic Technologies Department, and California's High Tech Center Training Unit, as well as others from the California Community College Chancellor's Office.

Once tools were developed, we piloted each with a group of testers from appropriate populations. Several current California community college students with different disabilities, under the supervision of a faculty member, tested the student survey. A few community college DE faculty members and administrators piloted the surveys designed for their populations.

Survey Dissemination

Identifying and contacting the target populations for each survey proved to be a challenging task. Due to privacy restrictions protecting currently enrolled students, we were not able to contact students directly to take the survey. Instead, we asked DSP&S coordinators on each campus to send an e-mail to students with disabilities, urging them to take the survey. We also requested that DSP&S offices and computer labs display posters with information about the survey and the survey link. As an incentive, we offered students who completed the survey a chance to win one of ten $50 Amazon gift cards.

Faculty members who have developed and taught DE courses were also difficult to reach directly. As no central offices had readily available contact lists of all faculty teaching DE courses, we asked the DE coordinator on each campus to send an e-mail to all faculty who had developed and/or taught a DE course. We offered faculty members completing the survey a $10 Amazon gift card.

We administered the third survey to DE and DSP&S coordinators on each campus. Because the CCC System Office provided contact information for these staff members, we were able to send the online survey link directly to this targeted group of desired respondents. As with the faculty survey, we offered all administrators completing the survey a $10 Amazon gift card.

Response Rate and Follow-Up

To encourage a good response rate, MPR made various presentations about the needs assessment to various groups including the CCC Educational Technology Advisory Committee, DSP&S regional coordinators, and the High Technology Center Training Unit Advisory Committee. Many at these meetings agreed to encourage their colleagues to complete the surveys. Distance Education and DSP&S coordinators received introductory e-mails about the MPR study from System Office personnel in April 2008. Subsequently, MPR staff sent initial e-mails in early May to students, faculty, and administrators inviting them to participate in the surveys, providing the link to the surveys, and offering incentives for survey completion. DE and DSP&S coordinators sent follow-up e-mails reminding students and faculty to take the surveys, and MPR staff sent DE and DSP&S coordinators reminder e-mails to do so as well. Additionally, the System Office staff contacted regional DSP&S coordinators to help remind nonresponding administrators to take the survey. Follow-up contact was concluded in mid-June 2008.

This report includes information from 451 students with disabilities. Among the student respondents, we included 422 students who completed the survey and 29 of 108 who partially completed the survey and provided enough data to use in these analyses. Measuring the survey response rates is difficult due to the indirect nature of the student survey dissemination. Because no central list exists of students with disabilities who have taken or contemplated taking DE courses, the number of potential survey takers is unknown. DSP&S coordinators contacted undisclosed lists of students, and some additional number of respondents learned of the survey by seeing MPR's posters in the DSP&S offices and computer labs.

The total number of faculty respondents included in this report is 647. We know that 522 faculty members completed the survey. Another 247 partially completed the survey, 125 of which we deemed usable in our analysis. However, faculty response rate is also hard to

measure because that survey was also administered through a third party. We asked DE coordinators to provide us with the number of DE faculty to whom they sent the survey invitation. In some cases we received these counts, and in others we did not, making it impossible to calculate accurate response rates. Nonetheless, in the case of both students and faculty, we thought that the numbers responding were adequate for conducting analyses.

The total number of administrator respondents included in this report is 111, including opinions of 98 administrators who completed the survey, and another 13 who partially completed it. Unlike the other two surveys, we were able to contact DE and DSP&S coordinators directly about their survey, thus enabling us to calculate the response rate. We contacted 254 administrators initially. Twenty-six of these contacts had nonfunctioning e-mail addresses, and one contact declined to participate in the survey, for a total count of 227 potential respondents. For those whom we had working e-mail addresses, we sent several reminder e-mails to those who had not responded. MPR staff also called non-respondents before the data collection closed. This yielded a final response rate of 49%.

Survey Data Analysis

Quantitative data collected for this project included extant System Office data on distance learning and accessibility issues and the online surveys of students, faculty, and administrators. MPR analysts cleaned the data, identifying unusable records and preparing data files for running statistical analyses. We analyzed the frequency data for all items in each survey and calculated crosstabulation frequencies for some items, as appropriate. Survey results were summarized using SAS statistical software.

Analysts also used the qualitative data provided in open-ended questions in the surveys to supplement the findings from the quantitative analyses. Qualitative data underwent data reduction and were systematically organized to enable the abstraction of themes and other insights. Once the data were reduced and organized, they were sorted. These data were integrated with the results of the quantitative analyses, verifying some findings, permitting elaboration of other findings, and suggesting cautions in the interpretation of others.

III. Description of Respondents

Important to understanding the meaning of survey results is knowing who took the surveys. As described previously in the Methods section, we attempted to contact all students with disabilities who had enrolled or contemplated enrolling in distance education (DE) courses, all faculty who have taught DE courses, and all DE and Disabled Students Services and Programs (DSP&S) coordinators. However, given the legal and practical limitations on reaching students and faculty, we are aware that only portions of these populations received information about the surveys. And despite efforts to follow up, only some students and faculty who were invited to take the surveys actually did. In light of these challenges, our student and faculty survey respondents are a convenience sample of the total populations. However, the administrator survey results are different, because we conducted a census survey of that group by contacting DE and DSP&S coordinators systemwide. Our analysis of the characteristics of the group that responded suggests that they can be considered representative of the group as a whole.

It should also be noted that not all survey takers answered every question on the survey, nor were they required to do so. In some cases, the survey automatically "skipped" some survey respondents past certain questions that would not be relevant to them based on their previous responses. In other cases, survey takers simply chose not to answer every question. So when it is reported that a particular group responded a certain way to a question, it means all who answered the question, not necessarily all who took the survey. For example, when we write that "administrators reported," we mean all administrators who answered that question. All survey questions, including the frequencies indicating how many respondents answered a particular question, are available in Appendix A.

Administrator Survey Respondents

Of those responding to the administrator survey, 43% were DSP&S coordinators (site-based or regional), 23% were DE coordinators (site-based or regional), and the remaining third were Office of Instruction, Technology, or other DE or DSP&S staff. Those responding had a wide range of experience levels. Most had served in their current administrative role for 3–5 or 6–10 years, each representing a quarter of respondents. One-third of respondents reported that they had served in their current role for 2 years or less, and just over 20% reported serving for more than 10 years.

Table 1 How many years have you been in that position?		
	Frequency	**Percent**
Less than 1 year	13	12
1–2 years	21	19
3–5 years	27	25
6–10 years	26	24
11–20 years	16	15

Respondents to the administrator survey came from community colleges across the 10 Chancellor's reporting regions, with their distribution being roughly even between regions.

Table 2 Please identify your college region.		
Chancellor's Office Reporting Region	**Frequency**	**Percent**
Region 1	10	9
Region 2	10	9
Region 3	11	10
Region 4	13	12
Region 5	8	7
Region 6	7	6
Region 7	13	12
Region 8	17	16
Region 9	10	9
Region 10	9	8

The administrators most frequently reported (44%) that their respective schools served 10,001–20,000 students. The next most common school size reported by administrators was 10,000 or fewer students (27% of respondents), followed by 20,001–30,000 (17%), 30,001–40,000 (6%), and more than 40,000 students (4%).[2]

Table 3 Approximately how many students does your college serve per year?		
	Frequency	**Percent**
0–10,000	29	27
10,001–20,000	48	44
20,001–30,000	18	17
30,001–40,000	7	6
40,001 or more	4	4
Don't know	3	3

Forty percent of administrators reported that their schools were located in suburban settings. Another third indicated that their schools were in urban environments, and the remaining 27% described their campus setting as "rural."

[2] Three respondents did not know how many students their schools served.

Table 4
Which setting best describes your college's location?

	Frequency	Percent
Suburban: near or part of a large metropolitan area	43	39
Urban: in a city	37	34
Rural: far from a large metropolitan area	29	27

Of those administrators who were able to estimate, nearly 70% said their colleges had served 500 or more students with disabilities in the last academic year. However, the vast majority of administrators, 80% of those who responded to the survey, could not estimate how many students with disabilities took DE courses from summer 2007 to spring 2008. A few factors could explain why administrators might not have known how many students took DE courses last year. First, in general, some students with disabilities choose not to identify themselves as having a disability. Others choose not to seek support services through DSP&S offices. In addition, some administrators, such as DE coordinators may have limited interaction with these students given the nature of their DE position.

Faculty Survey Respondents

Faculty respondents were drawn from 75 of California's community colleges. They reported a wide and fairly even distribution of experience levels: roughly 20% of faculty respondents had been teaching for 1 to 5 years, a quarter for 6 to 10, a third for 11 to 20, and another 20% for more than 20 years.

Table 5
How many years have you taught at the college level?

	Frequency	Percent
Less than a year	2	0.3
1–5 years	126	19.1
6–10 years	175	26.5
11–20 years	222	33.6
More than 20 years	136	20.6

Most faculty respondents had taught one or two discrete DE courses (52%). The second most common response among faculty was that they had taught three to five DE courses (30%). The remaining 15% indicated that they had taught six or more DE courses.[3] Similarly, most faculty respondents had *developed* one or two discrete DE courses (49%). Just over a quarter had developed three to five DE courses (28%), and 11% had developed six or

[3] Four percent of faculty respondents had taught no DE courses.

more courses.[4] They reported teaching courses in the social sciences most frequently (16%), followed by English (15%) and science (10%). The least commonly reported subject faculty had taught was foreign language (2%). A large portion (37%) had taught "other" subjects .[5]

Student Survey Respondents

Students from 49 California community colleges are represented in the student survey data. Just over half of the respondents to the student survey were age 28 or older. Most of the remaining respondents fell between the ages of 18 and 27, with just a handful younger than age 18. These ratios are not consistent with the total system student body; in the 2006–07 academic year, 42% were age 28 or older. Among those *taking DE courses* systemwide, only 33% were age 28 or older (CCCSO, 2008). Thus, it appears that survey respondents were somewhat older than all California community college students and DE coursetakers in California community colleges.

Two-thirds of the students who responded to the student survey were female. While this ratio is slightly more skewed toward females than is the student body systemwide (which was 55% female in the 2006–07 academic year), the ratio of female-to-male survey takers is consistent with the gender ratio among all DE course takers systemwide. Sixty-two percent of DE course takers at all California community colleges were female in 2006–07 (CCCSO, 2008). In addition, two-thirds of student survey respondents indicated that they have a current GPA of 3.0 or higher, with 13% reporting a GPA of 4.0. Among the remaining respondents, 18% reported having a GPA lower than 3.0 and 15% did not know their GPA.

Among student survey takers, the most common disabilities reported were learning disability, other disability, and psychological disability.[6] and mobility impairment. Students least often reported having a hearing disability, followed by a developmentally delayed disability, speech/language disability, visual disability, and brain injury disability. Eighty percent of students who took the survey reported that they sought out or were referred to DSP&S services.

Forty-seven percent of students responding to this survey had enrolled in a DE course, 50% had not enrolled before, and 3% were unsure. Of those students who had enrolled in a DE course, about a third had enrolled in one DE course, another third had enrolled in two or three DE courses, and the remaining third had enrolled in four or more. Students with GPAs

---

[4] Twelve percent of faculty respondents had developed no DE courses.
[5] "Other" subjects include courses that do not fall into the following academic areas: social science, English, science, mathematics, arts, history, and foreign language.
[6] The "Other" category is composed of students with disabilities other than: hearing impairment, visual impairment, speech/language impairments, acquired brain injury, developmentally delayed, learning disabled, mobility impaired, psychologically impaired.

of 2.0 or lower were less likely than the rest of their peers with higher GPAs to have enrolled in a DE course. Also, GPA did not appear to vary with the number of DE courses in which students had enrolled. However, the number of students included in this comparison was fairly small in some GPA categories, so it is difficult to draw conclusions about the relationship between GPA and number of DE courses taken by students.

Students with disabilities who were most likely to have enrolled in a DE course were psychologically impaired learners (58%) and mobility-impaired learners (52%). Those least likely to have enrolled in DE courses were speech/language-impaired learners (31%). However, in general, the number of DE courses in which students had enrolled did not appear to vary by the type of disability. For most disability types, students had taken one course, with each additional course taken receiving fewer and fewer responses, as might be expected.

Students who had enrolled in at least one DE course indicated that they completed DE courses at the following rates: about a quarter had enrolled in but had not completed a DE course; a quarter had completed one DE course; another quarter had completed two or three DE courses; and the remaining quarter had completed four or more DE courses.

IV. Findings

Status of Distance Education Courses

Distance Education and Hybrid Courses Offered

As previously described, the growth in popularity of distance education (DE) courses throughout California's community colleges has been dramatic in recent years. In the 1997–98 academic year, California's community colleges collectively offered 1,257 distinct DE courses. Ten years later, that number had grown to 7,689 distinct DE courses, 6,335 of which were Internet-based courses (CCCSO, 2008). When we asked administrators how many DE courses their respective campuses offered over the last year (summer 2007 through spring 2008), a third of administrators estimated that their campuses offered 1–50 DE courses. Roughly 40% of administrators estimated that their campuses offered 51–250 courses during that time period, and another 10% reported offering 251–500 courses.[7]

Table 6
Approximately how many courses from summer 2007 to spring 2008 were considered distance learning on your campus? (Please count each course with a discrete title only once.)

	Frequency	Percent
None	3	3
1–10 courses	8	8
11–50 courses	28	27
51–100 courses	15	14
101–250 courses	28	27
251–500 courses	10	10
Don't know	13	12

A closer look at DE course offerings suggests that the number of DE courses offered varied by Chancellor's Office reporting region. Administrators from Region 3 (Bay Area) were the most likely region to report that their campuses offered 50 or fewer DE courses (78%). At the other end of the spectrum, administrators from Region 9 (Desert) were the most likely region to report offering more than 100 DE courses (67%). As would be expected, those

[7] Three administrators (or 3% of those who answered this question) reported that their campus offered no DE courses. Another 13 respondents (or 12%) did not know how many DE courses their campus offered. This can likely be attributed to variation in the job responsibilities among administrator respondents.

campuses serving larger numbers of students offered greater numbers of DE courses. Administrators from colleges serving 20,000 or more students were far more likely to report that they offered more than 100 DE courses (65%) than those who served 10,000–20,000 students (31%) or fewer than 10,000 students (16%).

Hybrid Courses Offered

In general, campuses appear to offer fewer hybrid courses than fully online DE courses. Nearly two-thirds of administrators estimated that their campuses offered 1–50 hybrid courses from summer 2007 through spring 2008 (whereas only 34% of administrators estimated that their campuses offered 1–50 DE courses). And very few administrators reported that their campuses offered more than 50 hybrid courses during that time

As with the number of DE courses offered, the number of hybrid courses offered also appeared to vary by region and institutional size. Administrators from Chancellor's Region 10 (San Diego/Imperial) were the most likely to report that their campuses offered more than 50 hybrid courses (56%). Administrators from Chancellor's Region 1 (Far North) were the most likely to report that their campuses offered none or 10 or fewer hybrid courses (67%). According to reports of administrators from campuses serving 20,000 or more students, 37% of their campuses offered more than 50 hybrid courses. Campuses serving 10,000 to 20,000 students were almost as likely to report offering more than 50 hybrid courses (33%), but only 8% of administrators from campuses serving 10,000 or fewer students reported offering this number of hybrid courses.

Distance Education Courses Under Development

We also asked DE and DSP&S administrators how many new DE and hybrid courses were under development on their campuses. The term "hybrid" refers to those courses that are taught partially in a traditional, face-to-face format ad partially in an online format. For the purposes of our this survey, we defined hybrid courses as those which are not fully online but use the online format for 51% or more of the instruction. Among those responding, nearly two-thirds reported that 1–10 DE courses were being developed, with the other third indicating that 11–50 courses were being developed.[8]

Hybrid Courses Under Development

Fewer hybrid courses than DE courses were being *created* during the 2007-08 academic year. Thirty six percent of administrators reported that their campuses were developing 11 or more DE courses, compared with only 19 percent of respondents indicating that 11 or more hybrids were under development. A greater proportion of administrators (74 percent) reported that between 1 and 10 hybrid courses were under development, compared with only 61 percent of respondents indicating 10 or fewer DE courses were being created.

The number of hybrid courses under development also appeared to vary with Chancellor's Reporting Region. As with the number of DE courses under development, the most common response for administrators from most of the Regions was that 1–10 hybrid courses were under development. Only in the case of Region 10 (San Diego/Imperial) were administrators more likely to report that 11 or more hybrid courses were under development. The number of hybrid courses under development also appeared to vary with institution size. As expected, larger schools (those serving more than 20,000 students) most frequently reported that more than 10 courses were under development (17%), as compared with 9% of administrators at schools serving 10,001 to 20,000 students and 7% for those serving 10,000 or fewer students.

As with the number of DE courses offered, the number of DE courses under development appeared to vary somewhat with Chancellor's reporting region and institutional size. Overall,

[8] Two administrators (or 2% of those who answered this question) reported that no DE courses were under development on their campuses. Another 40 respondents (or 38%) did not know how many DE courses their campus offered. This can likely be attributed to variation in the job responsibilities among administrator respondents.

for almost all 10 regions, administrators were most likely to report that 1–10 DE courses were under development. Regions 2 (North) and 7 (Los Angeles) were the exceptions, with more administrators reporting that 11–50 DE courses were under development. Predictably, larger schools (those serving more than 20,000 students) most frequently reported that more than 10 DE courses were under development (37%), as compared to 22% of administrators at schools serving 10,001 to 20,000 students and 8% for those serving 10,000 or fewer students.

A relatively large number of faculty members, rather than a prolific few, account for the development of new DE courses. The faculty survey asked how many DE courses faculty had developed over the last 5 years. Almost half of faculty reported that they had developed one or two DE courses in the last 5 years, 28% had developed three to five courses in that time, and 11% had developed six or more courses.[9]

Subjects Offered Through Distance Education

Distance education faculty appear to have taught DE courses in a wide variety of academic subjects. The most common subjects taught by DE faculty respondents were "other," social science, English.[10] subjects, while the least commonly reported subjects were foreign language, history, and the arts.

By comparison, our survey of students revealed that they had taken DE courses in a range of academic subjects. Student survey respondents reported that the most common subject taken in DE courses was "other," followed by mathematics, English, social science.[11] By far the least commonly reported subject taken in the DE format was foreign languages, followed by the arts, history, and science. It is noteworthy that English and social sciences appeared to be among the most commonly taught and taken DE courses among our faculty and student survey respondents.

Student Success in Distance Education

According to CCC System Office data, in the 2006–07 academic year, 55.9% of all students in non-DE courses completed their traditional on-campus coursework.[12] Students enrolled in DE courses completed coursework at a slightly higher rate of 57.8%. When examining the completion rates of students with disabilities separately, it appears that they are successfully

---

[9] Eighty faculty respondents (or 12% who answered this question) reported that they had not developed a DE course in the last 5 years.
[10] The "Other" category is composed of subjects that fall outside the following subjects: mathematics, English, foreign language, arts, science, history, and social science.
[11] Ibid.
[12] "Completed" is defined as receiving the following grades: A, B, C, or P.

finishing courses at somewhat lower but similar rates as those of the student body as a whole, with 53.7% of students with disabilities completing non-DE coursework and 54.2% completing DE coursework (CCCSO, 2008).

Students Compare On-Campus and Distance Education Courses

We asked students a series of questions concerning their impressions of how DE courses compared to on-campus courses, in part to pinpoint attitudes about the DE format that might contribute to student success.

Half of students who had taken DE courses felt that the method of instruction for their DE courses made the course just as interesting as their on-campus classes, whereas 28% found the DE courses less interesting and 22% found them more interesting than classes on campus.

Table 7
In general, the method of instruction for my distance education courses made the course:

	Frequency	Percent
More interesting than my on-campus class(es)	48	22
Less interesting than my on-campus class(es)	61	28
The same level of interest as my on-campus class(es)	109	50

Perceptions did not generally vary by GPA, with the exception of students with very high GPAs. Among students who reported having GPAs of 4.0, some 60% found DE courses to be just as interesting as on-campus courses, almost 30% found them to be less interesting, and only 13% found them to be more interesting. For those with lower GPA levels, about half felt that DE courses and on-campus courses were equally interesting, with another 25-30% finding DE courses more interesting and the remaining quarter finding them less interesting.

We also asked students how easy it was to understand DE course materials relative to on-campus course materials. As with DE and on-campus courses, almost half of students felt that the online method of instruction used for their DE courses made the course material just as easy to understand as material in an on-campus class. Another 29% thought the DE courses made it harder to understand material than in their on-campus classes, and 23% thought the DE format made it easier to understand.

Table 8
In general, the online, Web-based method of instruction used for my distance education course made the course material:

	Frequency	Percent
Easier to understand than my on-campus class(es)	46	23
Harder to understand than my on-campus class(es)	58	29
About the same to understand as my on-campus class(es)	96	48

Student perceptions did not appear to vary with GPA, but they did differ by disability type. Students who were developmentally delayed or had brain injury impairments were the most likely group of students with disabilities to respond that the online format of DE courses made course material easier to understand (40% each). Hearing-impaired learners were least likely to indicate that this was the case. Interestingly, developmentally delayed students were also the most likely to indicate that the online format made course material harder to understand than on-campus courses. Perhaps this contradictory finding about developmentally delayed learners speaks to great variety in learning styles and needs among those who identify themselves as developmentally delayed learners.

Equal percentages of students felt that the lessons, activities, and homework for DE courses required either "more time" than on-campus classes or "the same amount of time" (39% for each response). Fewer students (23%) thought that DE courses took less time than on-campus classes.

Table 9
In general, how much time did lessons, activities, and homework demand for distance education courses when compared to on-campus class(es)?
(Please exclude travel time in your estimate.)

	Frequency	Percent
More time than on-campus class(es)	77	39
Less time than on-campus class(es)	46	23
The same amount of time as on-campus class(es)	77	39

Perceptions of time requirements did not appear to vary by disability type[13] but seemed to vary somewhat with GPA. Among students with various GPA levels, those with GPAs of 4.0 were most likely to respond that online courses required less time than on-campus courses. Students with GPAs of 2.0 or lower were least likely to indicate that this was the case.

While it is notable that roughly a third of students felt the online format made the course material less interesting and harder to understand, the popularity of DE, and perhaps students' success in this format, could partly be explained by the fact that two-thirds of students did not perceive the course material as less interesting or easy to understand when presented online. And, most notably, one could reasonably expect that the quarter of student respondents who found DE courses more interesting and easier to understand than on-campus courses were more successful as a result of this format. Finally, when considering the effect of the DE format on the amount of time students actually spend on coursework, it is apparent that nearly 80% of students are spending as much or more time on course-related

[13] There are too few students responding for hearing, speech/language, and developmentally delayed disabilities to draw conclusions.

activities than in on-campus courses. Whether this might deter some students from DE courses is one matter, but when considering student success, it appears that the vast majority of students are spending at least as much time, if not more, on their coursework as a result of the DE format.

Supports for Making Distance Education Courses Accessible

In striving to meet the goal of making all DE courses accessible to all students, one must consider the support system available to both those who design and teach the courses, as well as those who take the courses. Next, we examine how well community colleges provide assistance to faculty as they create DE courses and to students as they work with DE course materials.

Supports for Faculty

In considering the mechanisms for developing accessible DE courses, understanding the supports available to faculty developing DE courses is critical. Many campuses offer faculty access to personnel who can help instructors make courses accessible. Alternative media specialists, information technology staff, DE coordinators, DSP&S staff, High Technology Training Center staff, and others can help faculty with developing accessible DE courses. The following section details how support staff assist faculty in creating such courses.

Services

When asked what supports their campuses offered for developing accessible DE courses, both administrators (67%) and faculty (49%) most commonly selected workshops, seminars, or courses on designing accessible courses. Among faculty, the next most common supports reported were technical support on software for designing accessible DE courses (37%) and pedagogical support for designing accessible courses (22%). Approximately 17% of faculty and 3% of administrators reported that their campuses offered no supports.

Table 10
What supports does your college currently offer administrators for designing accessible distance education courses? (Please check all that apply.)

	Frequency	Percent
Workshops, seminars, or courses on designing accessible courses	66	67
Technical support on software that makes courses accessible	51	52
Pedagogical support for designing accessible courses	39	39
Manual on designing accessible courses	16	16
Release time to learn skills for developing accessible courses	15	15
Online self-paced tutorials on designing accessible courses	15	15
Other (please specify)	11	11
None	3	3
Don't know	14	14

Table 11
What supports does your college currently offer faculty for designing accessible distance education courses? (Please check all that apply.)

	Frequency	Percent
Workshops, seminars, or courses on designing accessible courses	233	49
Technical support on software that makes courses accessible	176	37
Pedagogical support for designing accessible courses	106	22
Online self-paced tutorials on designing accessible courses	69	15
Other (please specify)	45	9
Manual on designing accessible courses	44	9
Release time to learn skills for developing accessible courses	24	5
None	80	17
Don't know	94	20

When broken down further, the types of supports that faculty reported their colleges offer for developing accessible DE courses did not seem to vary with the number of DE courses developed. However, it is interesting to note that faculty who had taught six or more DE courses were somewhat more likely to report that no supports were offered by their colleges for developing accessible DE courses. Additionally, faculty who had developed only one or two DE courses were a little more likely to report that they "don't know" what supports their colleges currently offer to faculty for designing accessible DE courses.

When asked about what supports the colleges needed to help faculty design accessible DE courses, administrators most commonly reported that their campuses needed the following supports: online self-paced tutorials on designing accessible courses to faculty; a manual on designing accessible courses; and release time to learn skills for developing accessible courses (68%, 60%, and 59%, respectively). The 12 respondents who reported "other" concerning supports needed by the college to help faculty design accessible courses seemed to focus primarily on the need for additional technical support. Several also mentioned the need for System Office guidance and more local monitoring of the courses.

We also asked faculty what steps they needed to take to be able to develop an accessible DE course. They most often replied they needed to "learn which course elements need special treatment to be presented in an accessible format" (53%) and to "make content changes or enhancements to ensure accessibility" (47%). Thirty-six percent of faculty needed to work with other staff to ensure that course material was put into the proper format, and 25% needed to learn new software to develop the course. Sixteen percent of faculty respondents reported "none of the above" to items listed that might have helped them to develop an

accessible DE course. Overall, the skills and supports that faculty reported they needed in order to be able to develop accessible DE courses did not appear to vary by the number of DE courses developed. With one exception, faculty who had developed six or more DE courses were somewhat less likely to report that they needed to work with other staff to ensure that course material was put into the proper format. Also, faculty who had developed one or two DE courses were somewhat less likely to report that they needed to make content changes or enhancements to ensure accessibility.

We also asked faculty what type of assistance would encourage them to develop additional DE courses that are accessible. The large number of responses (351) yielded clear and unsurprising results: they need technical assistance, funding, workshops and training, and release time.

Sixty-seven faculty also responded to an open-ended question regarding "what else" faculty needed to do to develop accessible courses. The responses varied widely, but they most frequently clustered around several areas: do the necessary preparation (7)—by being trained, participating in workshops or courses, reviewing guidelines, related documents; get assistance/approval (12) from various departments that were specified by respondents; use a particular tool (6) such as Moodle, Blackboard, WebCT, or Etudes or work with the publisher. Five respondents also responded about video in particular and specified the need to have transcripts or to get it closed captioned. The remaining responses were scattered across a variety of categories, with specific mention of applying "universal design" and talking to students about their needs being the most noteworthy responses.

Incentives

Another form of support that some faculty reported receiving was incentives for developing DE courses. More than a third of faculty reported that they had received incentives to develop DE courses in the last 5 years, with 19% being offered funding and 17% being offered other incentives, which means that 63% of faculty reported receiving no incentives during that period. Further analysis revealed that responses concerning incentives offered did not vary by the number of courses faculty had developed from 2003–04 to 2007–08.

When asked which incentives they were given to develop a DE course, 72 of 80 faculty members provided explanations when they marked "other." The most common response was that they were given moderate incentives or extra unit credit. The remaining responses were divided among assistance in developing a course; positive effects on their quality of life—e.g., ability to stay at home with a newborn; and the opportunity to continuing working. Two respondents mentioned that it was an incentive to know that more courses would be available to students. Seventeen coordinators provided information about "other incentives" as well. Six, however, simply said they did not know. Of the remaining incentives, the most

frequent one mentioned was "technical support." Several mentioned "stipend" (perhaps differentiating it from "funding"), and one mentioned "release time."

Supports for Students

The availability and usefulness of supports for students with disabilities who enroll in DE courses are among the most important aspects of ensuring students are able to access online course material. This section explores the availability of services and technological tools to students with disabilities who take DE courses.

Support Services

Among students who had enrolled in at least one DE course, 61% reported that they could reach DSP&S or other personnel by remote communications (phone, e-mail, Web interface, etc.) if they were having trouble accessing the material for a DE course. While students' perceptions about the availability of assistance with accessibility issues through remote communications generally did not appear to vary by disability type, students with a hearing impairment were somewhat less likely and those with brain injuries were somewhat more likely to say these resources were available.

Meanwhile, when asked the same question, 93% of administrators and 72% of faculty reported that their DE students with disabilities could reach the DSP&S Office or other personnel handling accessibility issues either by toll-free number, e-mail, Web interface, or another remote feature. The difference between student and administrator/faculty perceptions of these available supports might imply that campuses need to make students more aware of these services. Additionally, 71% percent of administrators and 75% of faculty reported that students with disabilities had access to a help desk at which they could receive at least a minimum of assistance if they were having trouble using the Web interfaces in DE classes.

Assistive Technology

Another lens through which to view supporting accessibility is the availability and usefulness of assistive technology, as applied to DE courses. Fifty-eight percent of students who had enrolled in at least one DE course did not use assistive technology for that course. Twenty-five percent did not know if they used assistive technology in their DE course(s), and 17% reported that they did use such technology.

When asked which assistive technologies they used in their DE courses, students most commonly said they used Kurzweil 3000 (32% of those who indicated they had used an assistive technology in a DE course). This technology was followed by Dragon NaturallySpeaking, which 24% of students reported using. A seemingly high percentage of students (26%) reported using assistive technology but not knowing which one. The assistive technologies with the lowest rate of usage by survey respondents were PDF Aloud, DAISY

readers, WYNN, and ReadPlease, with only 3% using each one. It should be noted that the number of respondents who had taken at least one DE course and used assistive technology was very small (37 students), meaning the size of the sample for the questions about the use of assistive technologies is small and should not be used to generalize about the student body at large.

Of those students who reported that they did use assistive technology in their DE course(s), 63% found that technology was "almost always" effective in helping them access online course material. Twenty-nine percent found assistive technology to "sometimes" be effective, and 9% found it to "never" be effective. Seventy-nine percent of administrators and 54% of faculty reported that their college provides training or supports for students with disabilities in using assistive software for DE courses. Another 13% said their college does not provide this support, and 9% did not know if their campus provides it.

As one would expect, use of assistive technology in DE courses varied with disability type. Among disability groups with enough respondents to draw conclusions, visually impaired learners, mobility impaired, and learning disabled learners were the most likely to report that they used assistive technology in DE courses (39%, 27%, 24% respectively).[14] Hearing disabled and psychologically disabled students were the most likely to indicate that they did not use assistive technology in their DE courses (78% and 62%, respectively).

When asked which assistive technologies are currently in use on their campuses, administrators most often cited JAWS for Windows, followed by Dragon NaturallySpeaking, Zoom Text, and Kurzweil 3000. The assistive technologies least often reported as used on campus were Supernova, Word Q, Dolphin Tutor, and Premier Assistive Technology Suite. It is notable that both students and administrators report that Kurzweil 3000 is among the most widely used assistive technology tool.

Faculty Satisfaction with Support for Students

When we asked faculty how satisfied they were with various services that students with disabilities in their distance education courses receive, more than half of faculty were "satisfied" or "somewhat satisfied" with assistance from DSP&S alternative media specialists, campus information technology staff, and campus DE coordinators. Approximately 45% were satisfied with the quality and the reliability of the assistive technology software. Many replied "not applicable," but less than 17% were dissatisfied with these supports.

[14] Too few students who identified themselves as speech/language impaired and developmentally delayed responded to this item to draw conclusions.

When asked what would make it easier for students with disabilities to succeed in DE courses, faculty members provided 250 open-ended responses, and they focused clearly on a small number of specific responses presented here in order of frequency of mention: 1) provide an orientation session to help students accommodate the online environment; 2) provide assistance that is readily available through a help desk or other means; and 3) either encourage students to self-identify early or facilitate identifying students who will be in online course as early as possible. The only other response that occurred with some frequency was "don't know."

Tools and Processes for Making Distance Education Accessible

Many tools and processes are used to ensure that DE courses are developed and maintained to be accessible. State guidelines and Federal 508 standards outline which course elements must be accessible. In addition, some colleges and districts have their own accessibility policies that provide interpretation of these requirements and further define what the college finds acceptable. Colleges must ensure that faculty and administrators are aware of their responsibilities in making DE courses accessible and that the courses are implemented as such. Faculty typically develop outlines for their proposed DE courses, and a curriculum review committee assesses their intention to offer a useful and accessible course. Various departments on campus and the faculty then work together to ensure that those courses being developed, or currently offered, are truly accessible.

The surveys asked faculty and administrators about the tools and processes used to make courses accessible. Responses provide some insights into how well the tools and processes are working for their intended purposes.

Guidelines Offered by State

To help faculty and campus administrators gain a better understanding of what needs to be made accessible in DE, the California Community Colleges System Office released *Distance Education: Access Guidelines for Students with Disabilities* in 1999. This document, which is just one tool that can help campuses, outlines the basic requirements for providing access, guidelines for specific modes of DE delivery, and software design guidelines. The surveys asked both administrators and faculty a series of questions about the guidelines. A greater percentage of administrators than faculty were familiar with the guidelines, but both groups found them helpful.

Administrator Views of Guidelines

When asked if they were "familiar with the guidelines," 94% of administrators indicated they were. The other 6% were either not sure or not familiar with these guidelines. Familiarity with the Distance Education Guidelines did not appear to vary by administrative

role, with uniformly high responses (over 90%) across all position types, including campus and district DE Coordinators, DSP&S Coordinators, Technology Staff, Office of Instruction personnel, and others.

Among those administrators who were familiar with the guidelines, 41% estimated that 75–100% of "DE courses follow the access guidelines." Another 29% thought that 26–75% follow the guidelines and 16% think 0–25% of courses do.[15] This perspective varied somewhat by administrative roles. DE Coordinators were most likely to report that more than 50% of DE courses follow the access guidelines (74%). This rate was lower among DSP&S Coordinators (54%), and lower still among Technology, Office of Instruction, and other staff (53%).

When asked about the "helpfulness of the guidelines" in developing accessible DE courses, 85% of administrators who were familiar with the guidelines found them to be "very helpful" or "somewhat helpful" in doing so. Those who responded "somewhat helpful" outnumbered those who responded "very helpful" two-to-one. Of the administrators who reported not using the guidelines to develop accessible DE courses, half of them reported using different guidelines.

DSP&S Coordinators were far more likely than DE Coordinators or other personnel to find these guidelines "very helpful" in developing accessible DE courses. DE Coordinators and other staff more frequently described these guidelines as "somewhat helpful." However, overall, very few respondents in any administrative role found the guidelines to be "not very helpful" in developing accessible DE courses. Additionally, few administrators reported not using the guidelines in developing DE courses.

For those administrators who indicated that they had not used the guidelines, we asked if they had used alternative ones. Only three coordinators provided information. The following quote gives an indication of the efforts that are being made on campuses:

> We are trying to educate ourselves and the college community to ensure that our DE courses are accessible to students with disabilities. Toward that end, accessibility training is part of our recently adopted program of training for online teaching. Your survey is reminding me that as [a] coordinator, I need to refine my understanding of specific techniques for ensuring accessibility.

---

[15] Thirteen administrators, or 12% of those who answered this question, reported that they "don't know" what percentage of their campus's DE courses follow the aforementioned guidelines. This finding can likely be attributed to variation in the job responsibilities among administrator respondents.

In response to the question regarding "how the access guidelines have been used" in developing DE courses, 56 administrators provided that information. The most common response (20) was that they were used as the starting point for all development or as part of any training provided to those developing courses. The next most common response (18) was that they were used in the development or course review process, in some cases for developing a checklist, template, or "Web standards." Seven administrator respondents indicated that the guidelines were simply disseminated to key staff or to all faculty, and a few indicated that they were used to ensure that they were in compliance or to "lend legal support."

Faculty Views of the Guidelines

We also asked faculty if they were "familiar with the DE access guidelines." Half of faculty respondents reported that they were familiar with them, quite a bit lower than the rate of familiarity among administrators. Another 25% weren't sure if they were familiar with the guidelines, and the remaining 25% were not familiar with them. Familiarity with DE guidelines appeared to vary somewhat with the number of DE courses faculty had developed. Those faculty respondents who had developed six or more DE courses were more likely to report that they were familiar with the guidelines (63%) than those who had developed one to two (49%) or three to five (48%) DE courses.

When asked about the "helpfulness of the guidelines" in developing accessible DE courses, 78% of faculty found them to be "very helpful" or "somewhat helpful." Again, as with administrators, those faculty responding "somewhat helpful" outnumbered those indicating "very helpful" by two-to-one. Fourteen percent did not find the guidelines to be very helpful, and 8% did not use them in developing their DE course(s). Faculty's views did not seem to vary according to how many DE courses they had developed over the past 5 years. However, those who had taught one to two DE courses were somewhat more likely to report finding the DE access guidelines to be "very helpful" than those who developed three or more.

Faculty also reported on their "frequency of using the guidelines." Approximately 32% of faculty said they "almost always" used the guidelines, and 53% said they "sometimes" used them when developing DE courses. For those who were not familiar with the Distance Education Access Guidelines, roughly 60% reported attempting to make their DE courses accessible using other guidelines. The frequency with which faculty used the guidelines did not seem to vary greatly with the number of DE courses they had developed in the last 5 years. However, it appears that those faculty who had taught one to two courses were slightly more likely to report that they "almost always" used the DE Access Guidelines in developing accessible DE courses.

Of the 160 faculty respondents who provided information in the open-ended item about "how they used the guidelines," almost all indicated that they used them as a reference,

checklist, or for specific information on particular aspects of making their courses accessible. Only a few said they didn't use them, and one person indicated that the fact that the guidelines were developed in 1999 limited their usefulness.

Among those faculty respondents who indicated that they "used guidelines other than this document offered by the state," 147 faculty respondents explained that they received help from experts on the campus either from guidelines provided by the school or by consulting with individuals with specific knowledge—from the DE department, DSP&S, or other faculty with experience in making their courses accessible. The next most common response was that they learned specific strategies from courses or workshops they took. Use of alternative guidelines did not appear to vary by number of DE courses taught.

College and District Accessibility Policies

In addition to using statewide guidelines to help create accessible DE courses, we were interested in whether community colleges and districts had developed their own accessibility policies. Among administrators, 40% reported that their colleges or districts had an accessibility policy that guides administrators and faculty in developing and maintaining courses that are accessible to all students. Another 32% said they "don't know" if their campus had such a policy, and 28% reported not having such a policy. Of administrators who reported that their campus or district had an accessibility policy, 82% reported knowing what their college or district's policy said. We also asked if their campus or district provided an accessibility checklist for DE course development. Of administrators who reported that their campus or district had an accessibility policy, 46 percent said that the policy did not include accessibility checklists for DE course development, but 36% reported that theirs did have such tools. The remaining 18% indicated they "don't know" if a checklist accompanies their local accessibility policies.

Awareness of Accessibility Mandate

We wanted to determine the depth of faculty understanding about the requirements to make DE course material accessible to all students. The vast majority of faculty respondents, 92%, reported that they knew DE courses must be accessible to all students. When asked whose responsibility it is to make DE courses accessible, 48% of faculty reported that making DE courses accessible is their own responsibility as faculty members. Another 13% reported that it is expressly *not* the faculty's responsibility to make DE courses accessible. Thirty-one percent of respondents reported that, while they knew DE courses must be accessible, they were not sure whose responsibility it is to make those courses accessible.

Awareness of the requirement that DE courses be accessible to all students did not vary by the number of DE courses faculty had taught. However, faculty who had taught six or more DE courses from 2003–04 to 2007–08 were somewhat more likely to think that it was not

their responsibility or that they didn't know who was responsible. Among those faculty members who were aware that DE courses needed to be accessible to all students, the source of that information did not appear to vary by number of DE courses developed. Put another way, faculty appeared to have learned about the requirement to make DE courses accessible from the same sources, irrespective of how many DE courses they had developed.

Among faculty who were aware that DE courses needed to be accessible to all students, they reported that they were most often informed of the mandate by the Distance Education Department (56%). Thirty-five percent of respondents reported that DSP&S informed them. The next most common source of information was other faculty (18%).

Support Responsibilities for Accessibility

In addition to understanding the use of various federal, state, and local policies in creating accessible DE courses, it helps to understand which campus personnel were responsible for DE support responsibilities. We asked both administrators and faculty whether these responsibilities were clearly designated to specific departments on their respective campuses. Administrators were nearly evenly split between those who felt that DE responsibilities were clearly designated to specific departments on their campuses and those who did not. Similarly, half of faculty respondents believed that DE support responsibilities were clearly designated to specific departments on their campuses. The remaining half were evenly split between believing that responsibilities were not clearly designated and not knowing whether this was so. These findings suggest quite a bit of ambiguity in the minds of a large number of community college administrators and faculty about where these responsibilities lie.

There appeared to be some variation by administrative role concerning perceptions of how clearly DE support responsibilities were designated to specific campus departments. DE Coordinators and other staff (Technology Office of Instruction, etc.) responded similarly, with 61% and 56%, respectively, reporting that DE support responsibilities were clearly designated. DSP&S Coordinators were somewhat less likely to believe these responsibilities were clearly designated, with 39% selecting this response.

We wanted to explore further which personnel play key roles in determining and enforcing the accessibility of DE courses. We asked administrators which personnel on their campuses determine whether curriculum can be made accessible. The most common responses were DSP&S personnel, DE/Academic Affairs personnel, and faculty (53%, 52%, 52% respectively). Administrators responded similarly when asked which personnel review curriculum after development to ensure accessibility, with DSP&S personnel, DE/Academic Affairs personnel, and faculty again receiving the most responses (52%, 46%, 43% respectively).

For the 11 respondents who indicated that "other" personnel review curriculum for accessibility, five of them noted that there was no formal monitoring process. Others mentioned the DE subcommittee of the Curriculum Committee, peer review, a collaboration between Open Campus, IS, and DSP&S, and Deans of the Academic Division.

However, when faculty were asked the same questions, they responded differently. The most common responses to the question about which campus personnel determine whether curriculum can be made accessible were "faculty" and "don't know" (34% each). The next most common response was "DE/Academic Affairs personnel," with 29%. Seven percent of respondents reported that "no one" determines whether curriculum can be made accessible on their campus. It appears that faculty opinion about which personnel determine whether curriculum can be made accessible did not vary with the number of DE courses that faculty had developed.

As for who faculty believe are responsible for reviewing curriculum after course development to ensure accessibility, about a third reported that DSP&S personnel were responsible, and 28% reported DE/Academic Affairs personnel. A quarter of faculty respondents reported that it was the faculty's responsibility to review curriculum after development for accessibility. Notably, a third of faculty respondents indicated they "don't know" which campus personnel were responsible for reviewing curriculum after development to ensure accessibility.

Most of the respondents who indicated "other" when asked about additional personnel who complete the review tasks to determine accessibility mentioned the curriculum committee. A few responded that it was the "T & L Center" or the High Tech Training Center.

Intra-Departmental Cooperation

Beyond capturing beliefs about which personnel were responsible for ensuring the accessibility of DE courses, we wanted to understand the perceptions of administrators and faculty members about how well the different departments supporting DE accessibility cooperated. Almost one-half (47%) of administrators reported that the various offices supporting the accessibility of DE courses on their campuses worked together effectively to "a large extent," while 42% said they worked together effectively to "a small extent." Meanwhile, just over a quarter of faculty reported that these offices worked together effectively to a "great extent." Slightly less than a quarter believed that they worked together effectively to a "small extent." Eight percent of faculty reported that the offices did not work together effectively at all. A large portion, 43%, of faculty respondents did not know whether the various offices supporting the accessibility of DE courses on their respective campuses worked together effectively.

Administrators' perceptions of the extent to which the various offices supporting the accessibility of DE courses worked together effectively did not appear to vary much by position. Roughly half of administrators across all job types believed that the offices supporting DE accessibility worked together effectively to a "large extent." Almost as many administrators across all job types responded that these offices worked together effectively to a "small extent." Only one respondent reported that these offices didn't work together effectively "at all." Additionally, faculty perceptions of the extent to which the various offices supporting the accessibility of DE courses worked together effectively did not appear to vary with the number of DE courses faculty had developed.

Assessment of Accessibility of Distance Education Courses

Given the previously described information on supports, tools, and processes, how well are California's community colleges doing at making DE courses accessible? Students, faculty, and administrators surveyed were all asked to give their opinions. Overall, a large majority of students did not encounter problems with the accessibility or navigability of DE courses, though the evidence suggests some subgroups struggled with accessibility more than others. Concurrently, faculty generally believed that most of the DE courses they had taught over the last 5 years were accessible. Administrators appeared to have been somewhat less confident about the accessibility of DE courses, though more than half reported that most DE courses offered and developed during the 2007–08 academic year were accessible.

A General Assessment of DE Accessibility

Students

Of those students who had taken at least one DE course, about two-thirds reported that they found the DE courses they in the last years to "almost always" be accessible. Meanwhile, 31% found those courses to "sometimes" be accessible, and 5% reported that they were "never" accessible. When asked about the navigability of DE courses taken over the last 5 years, the results were almost identical, with two-thirds reporting that DE courses were "almost always" navigable, and most of the rest reporting that their courses were "sometimes" navigable. These findings suggest that a strong majority of those students who took DE courses did not have problems with their accessibility or navigability. But for the third who only found the courses to "sometimes" be accessible or navigable and the handful who found them "never" to be, further examination is needed.

Students' perceptions about the extent of DE course accessibility varied with their GPAs. Students with higher GPAs were more likely to report that DE courses were accessible than those with lower GPAs. For instance, 80% of students with GPAs of 4.0 found DE courses to "almost always" be accessible, while only 50% of students with GPAs of 2.0 or lower found them to be so. Student perceptions about the extent of navigability of DE courses also

appeared to vary with GPA. Students with higher GPAs were more likely to report that DE courses were navigable than those with lower GPAs. Among students with GPAs of 4.0, some 83% of students found DE courses to "almost always" be accessible, compared to only 50% of students with GPAs of 2.0 or lower.

Additionally, student opinion about the accessibility of DE courses appeared to vary somewhat by disability type. Students with hearing, visual, speech/language, and mobility impairments were more likely (60–67%) to report that DE courses were "almost always" accessible than students who have brain injuries, learning disabilities, developmentally delayed impairments, and psychological disabilities (42–57%). Student perception of the navigability of DE courses also appeared to vary with disability type. Students with visual, speech/language, and mobility impairments were more likely (70–80%) to indicate that DE courses were "almost always" navigable. Students with psychological impairments and learning disabilities were less likely (47–52%) to report that DE courses were "almost always" navigable.

When asked an open-ended question about other problems with accessing material in their online DE courses, 107 students provided responses—40 of whom indicated they had no problems. In one case, the student reported that there was "one instance where the grading scale in the course syllabus did not add up, but when I e-mailed the instructor, he fixed the problem immediately." Nonetheless, other respondents reported a range of problems. But the only type of problem that surfaced more than others was technical problems—sometimes located within the courses, and sometimes within the computers being used by students or with connection speeds and the like. Other problems receiving more than one or two responses concerned the amount of time allotted for taking tests, problems of accessibility when using MACs, lack of instructor support, adapting to an online environment, and issues related to specific disabilities (e.g., accessing dense text for students with limited upper body strength).

Faculty

Faculty reports revealed that a certain percentage of courses they had taught over the last 5 years were likely not accessible. Of those faculty members who responded to the survey, just over half had taught one or two DE courses in the last 5 years, 30% taught three to five courses, and 15% taught six or more.[16] When asked how many of the courses they had taught over the previous 5 years were accessible, 40% replied one or two courses, a quarter said three to five, and 10% said six or more. Also, 14% of the faculty who responded to this question did not know how many of the DE courses they had taught were accessible.

[16] Four percent of faculty reported that they had not taught a DE course in the last 5 years.

Table 12
How many of the distance education courses that you have taught in the last 5 years do you believe to be accessible to students with disabilities?
(Please count each course with a discrete title only once.)

	Frequency	Percent
1	139	30
2	91	20
3	53	11
4	35	8
5	37	8
6	14	3
7	6	1
8	6	1
9	2	0
10	2	0
More than 10	17	4
Don't know	63	14

When we compared the number of DE courses faculty had taught over the last 5 years to number of those courses they reported were accessible, we found that faculty believed that 87% of their courses were accessible overall.[17] When we broke this number down by number of courses taught, we found some variation. Among faculty who had taught one or two DE courses in the last 5 years, they believed, on average, that 95% of those courses were accessible. Among those who had taught three to five courses during that time, they believed 88% were accessible. And of those faculty who had taught six or more DE courses, they believed that 68% of their courses were accessible.

Administrators

We also asked DE and DSP&S administrators to estimate the extent to which their campuses' DE courses were accessible. Of those administrators who were able to estimate, nearly 50% said 76–100% of existing DE courses were accessible; about 35% said 26–75% of courses were accessible; and 15% said 0–25% were accessible.[18]

Table 13
In your estimation, what percentage of distance education courses offered through your campus from summer 2007 to spring 2008 were accessible to students with disabilities?

	Frequency	Percent
None	1	1

[17] This is the mean of the ratio number of courses taught to the number of courses taught that were accessible for all faculty members who responded to both questions. The standard deviation for this mean is 0.24.

[18] Twenty-two administrators, or 20% of those who responded to this question, indicated "don't know." This can likely be attributed to variation in the job responsibilities among administrator respondents.

0–10%	8	7
11–25%	5	5
26–50%	13	12
51–75%	17	16
76–100%	42	39
Don't know	22	20

We also asked administrators to estimate what percentage of the DE courses currently under development were accessible. Of courses being developed from summer 2007 to spring 2008, some 67% of administrators who were able to estimate indicated that 76–100% were accessible; 23% said 26–75% were accessible; and 7% said 0–25%.[19]

Table 14
Of all new distance education courses being developed on your campus from summer 2007 through spring 2008, approximately what percentage do you think will be made accessible to students with disabilities?

	Frequency	Percent
None	1	1
0–10%	3	3
11–25%	4	4
26–50%	7	6
51–75%	12	11
76–100%	56	52
Don't know	25	23

Though administrators reported that the rates of accessibility of DE courses being offered and under development during the last academic year are similar, it is interesting to note that respondents more often reported that DE courses under development were 76–100% accessible than those offered over the last year. This might suggest that administrators feel that their sites are doing a better job of addressing accessibility in the creation of newer courses than older, existing ones.

Meeting Federal Standards

While it was a lot of information for survey takers to absorb, we thought it was important to ask specifically about the accessibility standards outlined in Section 508 of the federal Rehabilitation Act, because asking respondents about these descriptions in particular might

[19] Twenty-five administrators, or 23% of those who responded to this question, indicated "don't know." This can likely be attributed to variation in the job responsibilities among administrator respondents.

draw a more accurate picture than relying on a survey taker's general impression of their courses.

Students

We asked students how often they had problems accessing course material for eleven of the sixteen 508 standards (those that were easiest to explain in simple language). At least half of students said they "sometimes" or "almost always" had problems with the following standards: "for timed assignments or tests, I was not given the opportunity to indicate that I needed more time" and "presenters/instructors did not describe their actions."

Most disability groups responded somewhat similarly when asked if they had the opportunity to indicate they needed more time, but those with "other" disabilities were less likely and visually impaired learners were more likely to say "sometimes" or "almost always."

Likewise, most disability groups responded somewhat similarly to "presenters/instructors did not describe their actions," but speech impaired and developmentally delayed learners were more likely and visually impaired learners were less likely to say "sometimes" or "almost always."

Students' next most common responses for "sometimes" or "almost always" having problems accessing course material included when they could not skip repetitive navigation links on websites; alternatives for multimedia presentations were not synchronized; non-text elements were not described in the text; online electronic forms did not have directions, cues, or information fields that they could access; and web pages were not designed so that all information was available to them regardless of colors used.

Table 15
In your distance education course(s), how often did you have the following problems accessing course material?

	Never		Sometimes		Almost Always		Not a Feature I Needed	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
For timed assignments or tests, I was not given the opportunity to indicate that I needed more time.	63	32	39	20	62	32	32	16
I could not skip repetitive navigation links on websites.	83	42	55	28	26	13	32	16
Non-text elements were not described in text.	89	46	46	24	22	11	37	19
Web pages were not designed so that all information was available to me regardless of colors used.	86	44	48	24	19	10	44	22
Alternatives for multimedia presentations were not synchronized.	71	36	54	27	19	10	53	27
Online electronic forms did not have directions, cues, or information fields that I could access.	101	51	51	26	17	9	28	14
Data tables did not identify what was in each row and column.	101	51	39	20	14	7	43	22
Presenters/instructors did not describe their actions.	68	35	84	43	14	7	30	15
Captioning was not readily available.	55	28	38	19	14	7	90	46
Web pages were not designed to avoid causing the screen to flicker.	111	56	33	17	12	6	41	21
Documents were not organized to be readable without a style sheet.	102	52	40	20	11	6	44	22

Faculty

Faculty were asked how often they thought the 508 standards were addressed when developing DE courses. For 10 of the 16 standards, the most common response for whether the standards were addressed when developing DE courses was “don’t know.” (This may be in part because the question itself was long and dense.) Those standards receiving the most responses in which faculty indicated they were “almost always” addressed included that a text equivalent for every non-text element is provided; frames have text titles that facilitate frame identification and navigation; and when a timed response is required, the user is alerted and given sufficient time to indicate that more time is required.

Of all the standards, those with most faculty responses for "never" or "sometimes" addressed were multimedia presentations offer equivalent alternatives that are synchronized with the presentations, and Web pages are designed so that all information conveyed with color is also available without color.

When asked which standards were the most difficult to address, 290 faculty respondents provided information in the survey. The information, however, was distributed across a wide range of issues, and it is not possible to draw conclusions about particular areas of difficulty.[20] There were also a fairly high number of faculty respondents (25) who indicated that they had no idea what the standards were, were confused by them, or just didn't understand them. The combination of these responses and the content of many others may suggest that faculty generally have a great deal of trouble understanding and applying the standards. Some even indicated that they didn't think it was at all within their purview to ensure that the courses were accessible, so they didn't need to understand them. Of those who reflected a reasonable level of understanding of the standards, those addressing multimedia presentations (standard b), links to plug-ins or applets (standard m), text equivalents (standard a), and client-side image maps (standard f) received the most mentions. Several subject areas were mentioned frequently as ones that posed specific problems: computer, math, art, music, and questions regarding how to deal with color and making student input accessible (e.g., when using chat) were also raised. Faculty also frequently mentioned the problem of finding or creating transcripts for videos.

Administrators

When we asked administrators how often they thought the 508 standards were addressed when developing DE courses, for all but two of the standards, the most common response was "don't know." Standards receiving the most responses for "almost always" were that a text equivalent for every non-text element is provided; documents are organized so they are readable without a style sheet; multimedia presentations offer equivalent alternatives that are synchronized with presentations; and web pages are designed to avoid causing the screen to flicker.

Of all the standards, those with most administrator responses for "never" or "sometimes" addressed were multimedia presentations offer equivalent alternatives that are synchronized with presentations; a Website that cannot comply with the 508 standards provides a text-only page with equivalent information or functionality and the content of the text-only page is updated whenever the primary page changes; and Web pages using scripting languages to display content provide functional text that can be read by assistive technology.

---

[20] It should be noted also that the item did not include the possibility of indicating that it was not applicable (N/A) to their situation, so many of the open-ended responses indicated this.

When asked which of the 508 standards have been the most difficult to address, 40 administrators responded. It should be no surprise that providing text equivalents for multimedia and graphic displays and captioning streaming video were the standards that were mentioned most often. Other items that were mentioned included a general lack of resources and the difficulty of monitoring external resources uploaded by instructors for accessibility.

Accessibility by Disability

When asked about the extent to which their own DE courses were accessible to students with different disabilities, faculty most often reported that their courses were accessible to a "large extent" for hearing impaired, mobility impaired, and speech/language impaired learners (in order by most responses). Faculty were least likely to report that their DE courses were accessible to a "large extent" for psychologically impaired, acquired brain injury impaired, and developmentally delayed learners (in order by fewest responses). Digging more deeply into these data, we wondered if faculty perceptions of how accessible their courses were to students with various disabilities would differ based on how many DE courses an individual faculty member taught.

Table 16
To what extent are the distance education courses you teach accessible to students with the following disabilities?

	Not at all		Small extent		Large extent		Don't know	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Hearing impaired	23	5	34	7	374	73	78	15
Visually impaired	63	13	112	22	191	38	138	27
Speech/language impaired	35	7	65	13	252	50	156	31
Acquired brain injury	38	7	55	11	85	17	330	65
Developmentally delayed	49	10	85	17	149	30	222	44
Mobility impaired	17	3	41	8	299	59	149	29
Learning disabled	26	5	97	19	186	37	199	39
Psychologically disabled	34	7	61	12	128	25	282	56

Overall, the number of DE courses developed by faculty did not appear to vary according to the extent to which faculty believed their DE courses were accessible to students with specific disabilities.

Administrators

We also asked administrators to estimate the extent to which DE courses on their campuses were accessible to students with specific disabilities. As with the faculty, administrators most frequently reported that DE courses were accessible to a "large extent" to students with

visual, hearing, speech, mobility, and learning disabilities (in order by most responses). Notably, fewer administrators believed that DE courses were accessible "to a large extent" for developmentally delayed learners, acquired brain injury learners, and psychologically disabled learners (in order by fewest responses).

Table 17
To what extent are your campus's distance education courses accessible to students with the following disabilities?

	Large extent		Small extent		Not at all		Don't know	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Hearing impaired	68	65	12	12	5	5	19	18
Mobility impaired	67	64	13	12	1	1	24	23
Learning disabled	59	57	13	13	2	2	30	29
Visually impaired	56	54	23	22	4	4	21	20
Speech/language impaired	54	52	19	18	0	0	31	30
Psychologically disabled	47	45	12	12	3	3	42	40
Acquired brain injury	36	35	18	17	2	2	47	46
Developmentally delayed	28	27	25	24	12	12	39	38

Based on these data, it appears that faculty and administrators agreed that courses were accessible to a lesser extent to students with learning or cognitive disabilities than to those with physical or mobility impairments.

Barriers to Providing Accessible Distance Education Courses to All Students

As with any goal, certain conditions can help or hinder how easily and quickly the goal is met. The three surveys—of administrators, DE faculty, and students—asked respondents questions about which barriers, if any, might prevent students with disabilities from gaining access to DE courses. These findings are divided into barriers to development of accessible DE courses and barriers to student participation and success in DE courses.

Barriers to Development of Accessible Distance Education Courses

Barriers to developing accessible DE courses can range from system issues like having insufficient funding, to campus issues like having an ineffective course approval process, to individual issues such as faculty having inadequate time to make a course accessible. When asked about possible barriers to development related to college systems, 66% of administrators reported that at least one barrier exists on their campus. The barriers most commonly selected, with over half of administrators responding for each, were lack of

awareness that courses should be accessible; lack of incentives to develop DE courses; and difficulties with the approval process associated with access.

Table 18
Administrators: Which of the following were barriers to developing distance education courses that are accessible to all students? (Please check all that apply.)

	Frequency	Percent
Lack of awareness that courses should be accessible	40	56
Lack of incentives to develop distance education courses	39	54
Difficulties with approval process associated with access	38	53
Difficulties with accessibility of publisher e-packs	31	43
Lack of time to develop new courses that are accessible	30	42
Lack of proper tools (software, equipment, or materials) for making courses accessible	25	35
Other (please specify)	18	25
Lack of technical support or guidance in making courses accessible	17	24
Insufficient funding to develop distance education courses	17	24
Lack of time to update previously developed distance education courses to make accessible	13	18
Lack of accessibility guidelines that are useful and understandable	2	3

Of those administrators providing explanations for their selection of "other," responses fell into the following categories, listed from highest to lowest frequency: lack of staff/resources, lack of a systematic approach to and enforcement of the requirement, and lack of understanding, leadership, or support for meeting the requirement.

When asked the same question about barriers, faculty who had developed DE courses had quite a different perspective—ranking their top barriers entirely differently from administrators. Approximately 87% of faculty reported that at least one barrier existed on their campus. They most frequently cited lack of proper tools; lack of time to update previously developed DE courses for accessibility; and lack of technical support or guidance in making courses accessible (50% and 47% each for the last two responses, respectively). Faculty also frequently cited lack of useful accessibility guidelines, lack of time to develop new accessible DE courses, lack of incentives, and lack of funding (41%, 39%, and 38% each for the last two responses, respectively). Approximately 13%, or 62 faculty members, replied that there were "no barriers" to developing accessible DE courses. Of the 41 respondents selecting "other," the most common responses were related to a lack of adequate assistance and/or tools, lack of knowledge on the part of faculty, lack of adequate funding, and a lack of time.

Table 19
Faculty: Which of the following were barriers to developing distance education courses that are accessible to all students? (Please check all that apply.)

	Frequency	Percent
Lack of proper tools (software, equipment, or materials) for making courses accessible	233	50
Lack of time to update previously developed distance education courses for accessibility	217	47
Lack of technical support or guidance in making courses accessible	214	46
Lack of accessibility guidelines that are useful and understandable	188	41
Lack of time to develop new courses that are accessible	182	39
Lack of incentives to develop distance education courses	177	38
Insufficient funding to develop distance education courses	177	38
Lack of awareness that courses should be accessible	105	23
Difficulties with accessibility of publisher e-packs	78	17
There were no barriers	62	13
Difficulties with approval process associated with access	38	8
Other (please specify)	37	8

It is also important to note that some faculty mentioned opposition or other kinds of resistance, with one mentioning the fear of eliminating faculty jobs. Several mentioned that they never had any students indicate that they needed such accommodations, and others noted difficulties due to the nature of particular subject areas, such as computers and math.

Additional survey questions explored certain aspects of the barriers that faculty identified as being an issue. Survey responses provided more information about awareness of the accessibility requirement, tools and technical support needed to support faculty, costs to develop accessible DE courses, incentives, e-packs, and guidelines for developing accessible courses.

Lack of awareness that courses must be accessible was the barrier administrators selected most often (56%). In a separate survey question, faculty described their understanding of whether DE courses must be accessible to all students. Approximately 92% of respondents knew that DE courses must be accessible. The 8% of respondents, or 47 faculty members, who did not know that courses needed to be accessible, came from 18 campuses. It is worth noting that the faculty who responded to a request to take this survey may generally be more aware of this requirement.

While making a DE course accessible is a joint effort among faculty, DSP&S and technology staff, DE departments, and others, in informal interviews with administrators that were

conducted before developing the surveys, many said that they saw faculty as ultimately responsible for the courses they teach. However, results from faculty reveal that many survey takers were not aware of this expectation. While 48% of faculty said that on their campus it *was* their responsibility to make courses accessible, 44% of faculty said it was *not* their responsibility or that they did not know who was responsible. This confusion around who is ultimately responsible may contribute to administrator frustration with the approval process that 53% of administrators cited as a barrier.

Awareness of the requirement that DE courses be accessible to all students did not vary by the number of DE courses that faculty had taught or developed. However, generally faculty who had *taught* six or more DE courses from 2003–04 to 2007–08 were somewhat more likely than those who had taught fewer courses to think that it was not their responsibility or that they didn't know who was responsible.

Two of the three most commonly selected barriers by faculty were *lack of tools* and *lack of technical support* (50% and 46%, respectively) in making courses accessible. Administrators cited these barriers less often (35% and 24%, respectively), but they had insights on what tools and supports campuses need. When asked which supports their campuses needed to help faculty design accessible DE courses, administrators most commonly selected online, self-paced tutorials on designing accessible courses; a manual on designing accessible courses; and release time to learn skills for developing accessible courses (68%, 60%, and 59% responses, respectively).

Informal interviews with administrators and faculty before developing the surveys implied that *costs* might be a significant barrier on some campuses. To determine how pervasive this view was, a follow-up question asked administrators and faculty whether they believed their campuses had insufficient funding for 1) developing DE courses and 2) developing *accessible* DE courses.

Table 20
Which best describes your understanding of whether distance education courses must be accessible to all students?

	Frequency	Percent
I did not know that distance education courses needed to be accessible to all students.	47	8
I know that distance education courses must be accessible to all students. I am not entirely sure who is responsible for making the courses accessible.	183	3
I know that distance education courses must be accessible to all students. On my campus, it is not the faculty's responsibility to make courses accessible.	77	13
I know that distance education courses must be accessible. On my campus, it is the faculty's responsibility to make courses accessible.	282	48

Similar to responses for the barriers question above (which found that 24% of administrators and 38% of faculty saw insufficient funding to develop DE courses as a barrier), responses to the follow-up cost question revealed that 49% of administrators and 36% of faculty thought their campuses had insufficient funding to develop DE courses. On the other hand, many did *not* see the funding as insufficient. Almost a third of administrators and faculty thought their campuses had sufficient funding for developing DE courses. (Approximately 22% of administrators and 29% of faculty replied "don't know" to the follow-up cost question.)

In this follow-up question, administrators and faculty were also asked whether insufficient funding to develop DE courses was a barrier to making them *accessible*. Slightly more administrators and faculty thought there was insufficient funding for developing *accessible* DE courses, including two-fifths of administrators and faculty. On the other hand, many did not see the funding as insufficient, with 37% of administrators and 24% of faculty believing their campuses had sufficient funding to develop *accessible* DE courses.

The fourth most common barrier mentioned by faculty concerned the clarity and usefulness of accessibility guidelines. While only 3% of administrators saw lack of useful and understandable accessibility guidelines as a barrier, 40% of faculty saw it as such. However, as mentioned earlier in this report, more than three-quarters of administrators and faculty who were familiar with the guidelines thought they were "very helpful" or "somewhat helpful." The large number of faculty citing a lack of clear and useful guidelines as a barrier may indicate that they are seeking a different type of guideline or may not be aware of the existing ones. As previously noted, only half of faculty indicated they were familiar with the DE access guidelines.

Another area explored in the survey was whether faculty received incentives to develop DE courses. Fifty-four percent of administrators and 38% of faculty felt that the lack of *incentives for developing DE courses* was a barrier to making them accessible. When DE faculty were asked what types of incentives they were given to develop DE courses, 63% reported that they were not given any incentives in the last 5 years. On the other hand, 19% said funding was offered as an incentive, and 17% said other incentives were offered. Responses did not vary by the number of courses faculty had developed from 2003–04 to 2007–08.

In informal interviews before survey development, administrators commented that *publisher's e-packs* contributed to the problems surrounding making DE courses accessible. E-packs provide online practice exercises, quizzes, case studies, questions, games, and other tools that instructors can integrate into their DE courses. However, many report that e-packs are not designed to be accessible. To determine how extensive an issue this might be, the faculty survey asked DE instructors how often they had used e-packs from 2003–04 to 2007–08.

Approximately 67% reported not using them, while 29% had used publisher e-packs in developing at least one course from 2003–04 to 2007–08. In general, the number of courses developed using publisher e-packs did not seem to vary in relation to how many courses faculty had developed in general over the same 5-year period.

Barriers to Student Participation and Success in Distance Education Courses

While the barriers to developing accessible DE courses present one dilemma for community colleges, barriers to student participation present a different set of issues. Survey responses provided insights into why some students with disabilities may not enroll or succeed in DE courses and why those who have not yet taken them have not done so. Students described some of the barriers they experienced in taking DE courses—some of which can be addressed by the colleges and others that likely cannot.

Factors Discouraging Students Who Have Taken Distance Education Courses from Enrolling in More

When asked if they had considered taking other DE courses but ultimately decided not to, most students who had previously taken a DE course said "no" (59%), while 41% said "yes." Of those saying "yes," the most frequently cited factor discouraging them from taking those courses was inadequate support from the instructor. Certain disability groups were more likely to state this than other groups, however. Developmentally delayed and acquired brain injury learners were more likely to say "inadequate support from instructor" discouraged them from taking another DE course. Mobility impaired and speech/language impaired learners were less likely to say that inadequate instructor support discouraged them from taking another DE course.[21]

The next most common factors cited were non-academic issues (family, health, etc.), insufficient time management or study skills required for DE courses, and that the materials were somewhat accessible, but not all the information that was crucial to understanding the course. Regarding the latter response, three disability groups—visually impaired, hearing impaired, and mobility impaired learners—were less likely than other groups to say they were discouraged from taking another DE course because of this factor. No visually impaired learners cited that this factor had discouraged them.

[21] It is important to note that small numbers of respondents with certain disabilities would render unreliable systemwide generalizations about those groups.

Table 21
Which of the following factors discouraged you from taking a distance education course? (Please check all that apply.)

	Frequency	Percent
Inadequate support from instructor	37	46
Non-academic issues (family, health, etc.)	28	35
Insufficient time management or study skills required for distance education courses	25	31
Materials are somewhat accessible but not all the information that is crucial to understanding the course	24	30
Other (please specify below)	21	26
Inadequate orientation or training on taking a distance education course	19	24
Materials are not fully accessible	17	21
Insufficient technical support with assistive software	16	20
Inadequate adaptive technologies or skill in using such technologies	14	18
Inadequate support from staff (DSP&S, DE, etc.)	13	16

Twenty-four students provided open-ended responses to the question about factors that discouraged them from taking additional DE courses. While none of the responses drew a large share of the responses, the fact that needed courses were not available was reflected most frequently (by five students). Other responses that all drew fewer than five mentions concerned the lack of support: instructors seemingly being unwilling to help; uncertainty in how to approach an online course; inadequate accommodation for a particular disability; lack of available computers on campus (for students without their own computer).

As with other similar questions, we observed that there was inadequate support available and that some instructors did not respond to e-mails or requests for information. One response was quite specific about the lack of support:

> The DSP&S High Tech lab has limited hours, none on Friday or Saturday. There is no overall introduction, orientation, or visual index for the students who may need to use the software. The regular college professors as well as the DSP&S counselors, staff and professors . . . do not provide explanations or demos of the software or arrange it with qualified technicians. So I was left to research software options on my own while I tried to keep up with my class assignments.

While a single response of this sort needs to be weighed against the possibility of misunderstanding or a lack of awareness of services available, it should also be considered in terms of the kind of support that needs to be available to make it possible for students with disabilities to have access to online courses.

We also asked students, "What would make it easier for you to succeed in DE courses?" There were 142 responses to this open-ended question, and by far the largest number of responses (32) referred to the instructor being more available. Many indicated that they did not receive responses to e-mails in a timely manner, were unsuccessful in finding instructors during office hours, or just needed the opportunity to meet in person on a weekly or other basis. Fifteen students requested accommodations for taking tests in terms of time. Some students (9) specified the need for specific technical support or longer lab hours. Six students specified the need for clearer guidance, expectations, and timelines for the courses, and 4 students indicated that they wanted to have more options for courses to choose from. Others mentioned specific features, such as use of Dragon NaturallySpeaking, more hybrids, more CDs or tapes, PowerPoint or podcasts of lectures, larger fonts, and captioning. Two mentioned that they preferred not to have group work included, because the logistics were often difficult. Finally, at least one student specified:

> [It would help] if the teachers would make the curriculum for the online environment instead of making it exactly the same as the in-class environment because they are very different. The way you are getting and learning the information is very much solitary and hands-on versus the classroom where the teacher is there to walk you through every step.

Factors Discouraging Those Who Have Not Yet Taken a Distance Education Course from Enrolling

Students who had *not yet* taken a DE course were asked what discouraged them from taking one. The most common responses were "other"; insufficient time management or study skills required for DE courses; inadequate support from instructor; and inadequate orientation or training on taking a DE course.

Of those who said "other," 44 students provided an explanation. Twelve indicated that they felt they needed the structure of an on-campus class and the personal support of a teacher to enable them to succeed. Notably, 10 students indicated that they didn't know what "online courses" were. Four students expressed concern about their own ability to pace themselves and to learn independently. Three also noted that they preferred the social interactions of courses offered on campus.

Table 22
Which of the following factors discouraged you from taking a distance education course? (Please check all that apply.)

	Frequency	Percent
Insufficient time management or study skills required for distance education courses	60	28
Inadequate support from instructor	58	27
Inadequate orientation or training on taking a distance education course	48	22
Materials are somewhat accessible but not all the information that is crucial to understanding the course	40	18
Non-academic issues (family, health, etc.)	40	18
Materials are not fully accessible	32	15
Inadequate adaptive technologies or skill in using such technologies	32	15
Inadequate support from staff (DSP&S, DE, etc.)	30	14
Insufficient technical support with assistive software	24	11
Other (please specify below)	79	36

As one student noted, "Not saying I am not motivated, but one needs to stay on top of his/her game when taking an online class. I think all too often it would be very easy to say, 'You know, today I don't feel like learning,' and before you know it, you have said that too many times, and now you are so far behind in material and coursework." The remaining responses were distributed, with a small number mentioning not being "computer savvy," not having the money to buy the equipment, and having only a dial-up Internet connection that would be too slow. One student noted a concern about how it "looks on a transcript [to take an online course rather than an on campus course], so I prefer to cover my bases and take a course in a classroom."

Both students who had taken DE courses, and those who had not, commonly cited inadequate support from the instructor as a factor discouraging them from taking DE courses. Learning-disabled students were most likely to say "inadequate support from instructor" discouraged them from taking a DE course. Mobility-impaired and hearing-impaired learners were least likely to say that they were discouraged from taking a DE course for this reason.

Providing a different perspective on support, faculty were at least somewhat satisfied with the services that students with disabilities in their DE courses received. More than half were "satisfied" or "somewhat satisfied" with students' assistance from DSP&S alternative media specialists, campus information technology staff, and DE coordinators. Less than 16% cited dissatisfaction with the assistance of those groups and of academic department administrators. They were also satisfied with the quality and reliability of assistive software. Faculty's satisfaction with these supports for students did not seem to vary according to the

number of DE courses they had developed over the last 5 years. (Because the populations replying to each survey came from different campuses, it is not possible to draw conclusions from comparing student and faculty opinions on supports.)

Administrators and Faculty Not Recommending Distance Education Courses for Students with Disabilities

In early informal interviews with administrators and DE faculty, some mentioned that they knew others who discouraged students with disabilities from taking DE courses. Approximately 43% of administrators and 36% of faculty who were asked about this issue in the surveys said that there were DE courses that they do not recommend for students with disabilities.

Table 23
Are there distance education courses that you don't recommend for students with disabilities?

	Frequency	Percent
Yes	166	36
No	301	64

Table 24
If yes, is it because these courses:

	Frequency	Percent
Are not well suited to certain students lacking time management and study skills?	98	60
Comply with accessibility guidelines but still are too difficult for students with disabilities to access and navigate?	51	31
Are not fully accessible to students with disabilities?	50	31
Other? (please specify)	49	30
Do not provide adequate support from faculty and staff for students with disabilities?	35	21

When asked why they do not recommend those courses, these administrators and faculty (55% and 60%, respectively) most commonly cited that those particular courses were not well suited to certain students who lack time management and study skills. If students do not have the discipline to check in daily for assignments or messages from the instructor, they may not do well in the course. The next most common reason given by administrators and faculty for not recommending those courses was that the courses are not fully accessible

to students with disabilities (43%). In explaining their reason, equal numbers of faculty (approximately 30% for each answer) said those courses comply with accessibility guidelines but are still too difficult to access and navigate; the courses were not fully accessible; and "other" reasons.

Forty-nine faculty who responded "yes" to the question about whether there were DE courses that they didn't recommend for students with disabilities provided open-ended explanations that focused on three primary reasons: 1) they didn't think the courses were suitable for students with particular disabilities—e.g., music for deaf students, art or motion picture critique for visually impaired learners, firefighting for physically challenged students; 2) lack of time management skills; and 3) computer access or computer literacy skills.

Factors That May Affect Student Success in Distance Education Courses

Students Report on Why They Drop Distance Education Courses

Approximately 39% of students who had taken a DE course dropped one before completing it. Students' likelihood of dropping a DE course before they completed it generally did not vary greatly for most disability groups. Most groups had 25% to 35% of students who said they had dropped a DE course. However, psychologically disabled or mobility impaired learners were much more likely to drop a DE course before completion (57% and 38%, respectively) than the other groups, and developmentally delayed learners were less likely to do so (20%). These drop rates need to be considered with rates of dropping classroom based courses.

When students were asked why they had dropped an online course, 75 provided an explanation. By far the most frequent response (30) reflected their belief that they just couldn't cope with the course and that they needed more time or more help. These responses did reflect a range of factors that contributed to their inability to cope, but they generally focused on the nature of the course and the fact that they needed to be able to discuss the problems they were facing with someone. Two particular responses are illustrative of why the students thought that they "couldn't cope" (the most frequent reason given):

- Although the placement testing indicated that I "should" be able to manage a higher level of study, I opted to take the prerequisite and simply was unable to keep up with the coursework. I needed a lot more time and a significant amount of tutoring.
- The DSP&S counselor and college catalog did not inform [me] as to the level of difficulty for several online courses, nor did they inform me that the college did not do an orientation or demo to assist DSP&S students who attempted to take these classes. I was referred to the DSP&S PC lab where staff is available to assist, but to ask for a demo of the software was impossible because I do not know what the overview of software options were. To get help I had to reveal my disabilities to staff (not knowing their level of training) and trust that they knew all the options in software and

> could understand my situation to find me the best match. I would prefer that staff gave a demo of each software so that students could come to that [demo] if it was appropriate. Another way [would be] if the teachers or counselors took the students to the library for training. Either way getting information about the software and how it could help would be appreciated.

This set of responses did not include other factors that led to their dropping the class, such as personal—family or health issues (12); technology problems (5); the fact that the collateral materials they needed, such as the textbook, were not available (5); didn't need the course (3), or the low quality of the course (3). There were also a smattering of responses that indicated problems with a particular type of course ("computer class—needed more hands-on"; art class—didn't have transportation to go to the Getty Museum, a requirement; Spanish—needed to be in class for language use); not sure of getting credit; changed major; too much for short winter intersession; class cancelled; and advised not to take it.

As mentioned in the Status of Distance Education Courses section of this report, 28% of students found DE courses less interesting than on campus courses; 29% thought DE courses made it harder to understand material than their on campus classes; and 39% felt that the lessons, activities, and homework for DE courses required more time than on-campus classes. These particular students may face different barriers in completing the courses. More investigation is needed to determine whether the level of accessibility of a DE course affects how interesting, difficult, or time consuming the course might be, but presumably it would contribute.

Administrator and Faculty Perceptions of Barriers to Student Success

Administrators and faculty speculated on factors that make it more difficult for students with disabilities to succeed in DE courses. The two most commonly selected factors chosen by both administrators and faculty were "insufficient time management or study skills" required for DE courses (61% and 55%) and "inadequate orientation or training" on taking a DE course (60% and 59%). Faculty opinions on all factors that might make it more difficult for students with disabilities to succeed in DE courses did not seem to vary in relation to faculty's years of experience teaching at the college level, nor by the number of DE courses faculty had taught in the last 5 years.

Of the 18 explanations of "other," administrators offered two common responses: the inability to cope in an environment where there is no face-to-face interaction for support, discussion, etc.; and the lack of reading comprehension or computer literacy skills.

Fifty-three faculty identified "other" factors that made it more difficult for students with disabilities to succeed in DE courses. The responses were fairly evenly distributed across a

small number of factors. Several indicated that current and developing technology was simply outstripping adaptive technologies. Other factors mentioned included the fact that students were not computer literate; they did not have good time management skills; faculty did not receive timely notification that they had students with disabilities in their classes (or students did not self-identify); or it would be too difficult to make a particular course (math mentioned frequently) accessible.

Although not cited as often as many other factors, approximately one-third of administrators and faculty cited "materials are not accessible" (45% and 25%) and "materials are *somewhat accessible but not all the information that is crucial* to understanding the course" (37% and 32%) as factors making it more difficult for students with disabilities to succeed in DE courses.

Additional Support

When administrators and faculty were asked whether they thought students with disabilities required more support in DE courses *than students without disabilities*, 35% of administrators and 40% of faculty agreed. Faculty who had taught 6 or more DE courses in the last 5 years were more likely to say students with disabilities required more support. Of faculty who agreed that students with disabilities needed more support than other students in DE courses, some provided explanations for their response. The 12 administrator responses indicated that it depends on the type of disability and the type of course. One specified: "Distance education limits the amount of 'face time,' which many students find they require. [Not] being able to sit in class, listen to other classmates and their questions, and being unable to ask questions of their own would inhibit many students from taking many of our distance education courses." Several administrators and faculty noted that students with disabilities need more support regardless, with one mentioning that more students with disabilities "struggle with distance education courses for non-technical reasons."

Of the faculty who agreed that students with disabilities needed more support in DE courses than students without disabilities, 169 provided explanations. Their responses focused on a small number of particular needs. These included extended time for tests and technical support. Most frequently, they reported the need for direct, step-by-step assistance to ensure that students understand how to proceed through the course and meet the requirements.

Another question elicited a slightly different response. When asked whether students with disabilities needed more support in DE courses *than they did in on-campus courses*, 37% of administrators and 41% of faculty responded "no." Only 20% of administrators and faculty each felt that students with disabilities do require more support in DE courses than on-campus courses.

Some administrators and faculty responding "yes" explained their response. The 25 administrators responding, in large part, noted that it depends on the nature of a student's disability, the level of a student's computer literacy, and the type of course. They also mentioned—as did faculty—that students with a learning disability or other cognitive impairment often lack the time management and independence needed to succeed in an online course. Two quotes are representative of the problems they noted:

- This is especially true with mathematics, where there is literally NO discussion about the topics being taught. Our learning disabled students have needed extra assistance to grasp many mathematical concepts in the past, and our visually disabled students have found that our Web-based instruction has been "lacking" in regards to accessibility.
- Students often need instruction in using assistive technology software with the distance education interface. They also need assistance with the format of the academic material, especially if it has to be converted from PDF documents, and so on.

Of the faculty who answered "yes," 73 provided explanations. There was great variety in faculty responses so it is easier to capture them with a few quotes that are representative of the themes:

- On campus, I hold review sessions and respond to individual questions in my office hours for disabled (and non-disabled) students. If a disabled student accesses these additional times and still does not understand, they are more likely to use other services on campus (e.g., tutor, their counselor, etc.). With online classes, I have found disabled students much less likely to use available services online. I spend significantly more time online trying to assist the students, and am less confident that the assistance I am providing is helping. It's much harder to "read" the student's understanding while the online exchange is going on.
- Things that can be cleared up in person tend to become a bit harder to explain or resolve at a distance.
- Students need to be able to understand written directions with no oral support. Many students with learning disabilities need additional instructions or follow-up, which happens on an individual basis in online classes, but only takes a few seconds in a face-to-face class. This creates numerous e-mails for the instructors of online classes.

Cost Issues

The surveys also sought to gather information about issues related to the cost of making DE courses accessible. Survey questions specifically asked administrators and faculty whether funding is sufficient, where it comes from, who on their campus would know the specific costs of making DE accessible, and whether determining which department offers it is an issue.

Administrators and faculty responded somewhat similarly when they were asked whether and how funding affected their ability to make courses accessible. As mentioned earlier, approximately a third of administrators and faculty felt their campuses had insufficient funding for developing DE courses, and close to 40% reported insufficient funding for developing *accessible* DE courses. While almost half of administrators and faculty didn't know if the cost of making certain features of DE courses accessible compromises the quality of the courses, approximately a third did not think it did. Just over one-fifth of administrators and faculty felt that cost does compromise quality.

It appears that on most campuses much of the funding provided to make DE courses accessible comes from categorical or general funds. More than half of administrators reported that "some" or "most" of the funding to make DE accessible comes from categorical funds, and half reported some or most of such funding comes from the general fund (district/college general apportionments). Far fewer reported that some or most of such funding comes from "other state" funds, federal funds, or private funds. Many administrators responded that they did not know if certain funding sources were provided (30-58%)

In response to the question about which departments are expected to pay to make DE courses accessible, there were 74 administrator responses. The most frequent response was the academic department developing the course (18). An even number of respondents (12 each) thought it was either DSP&S or a combination of DSP&S and DE, with 6 indicating that it was DE alone. The remaining respondents either didn't know or provided unclear information.

In conversations with administrators prior to survey development, some suggested that one barrier was determining which campus department would provide funding to make courses accessible. Because no one department is required to fund DE accessibility, and campuses determine how their general funds are spent, it is likely that there is discussion on campuses as to which campus budget those funds come from. While a third of administrators and more than half of faculty did not know whether determining which department will pay to make DE courses accessible was a barrier to development, a third of administrators and a quarter of faculty thought that it was. It appears that those saying more funding came from

the general fund to make DE courses accessible were more likely to say determining which department will pay for accessibility is *not* a barrier. Likewise, those saying less or no funding was coming from the general fund were more likely to say that it *is* a barrier.

When asked which department at their college was expected to pay to make DE courses accessible, 59 faculty provided a range of answers: 9 thought the responsibility resided with DE; 12 reported that the academic department in which the course was developed was responsible; 4 reported that DSP&S was responsible, and 4 thought the responsibility was with both DE and DSP&S. Notably, 12 faculty members thought that they had to pay for it themselves. The remaining responses indicated that paying for DE courses was not assigned to any individual or department; it belonged to the Division or District Office. Nineteen faculty members indicated they just didn't know.

In an open-ended question, both administrators and faculty were asked which features of DE courses seem to add the most to the cost of making them accessible. The 44 coordinators most commonly said closed-captioning (25). The next most frequent response (5) was staff to provide assistance, and the remaining responses were fairly evenly divided among simulations and more elaborate interactive components, videos, and training.

Of the 230 faculty who detailed which features of distance education seem to add the most to the cost, the most frequent response was "release time to develop the course." The remaining responses were fairly evenly divided among the need to do closed-captioning, create transcripts of videos, creating text equivalents for visual images, multimedia in general, and hardware/software. Forty-five respondents indicated they did not know.

More information on this and other cost issues will be gathered for Part II of this study. Survey takers provided information on which individuals on their campuses might best know the specific costs associated with making DE courses accessible including those knowledgeable about costs for 1) hardware, software, or tools; 2) training faculty and administrators; and 3) course development.

Demand for Online Courses

While knowing what campuses currently offer provides a snapshot of distance education, it is also important to consider the degree to which demand for it is being met. With that in mind, surveys asked administrators their perceptions of whether students with disabilities have access to the DE courses they'd like to take. We found that there may be unmet demand. Many administrators did not know about unmet demand, but more than 40% felt that "some" or "a few" students with disabilities are not taking DE courses but want to, are taking DE courses but want to take more, and are taking DE courses but want to take more in particular subjects.

Faculty would also like to see more DE courses taught from their campus. Almost 87% reported that they would like to see more DE courses in their subject area. Encouragingly, when asked if the requirement to make DE courses accessible made them *less* likely to develop more DE courses, 72% said "no." Faculty opinions on this issue did not seem to vary in relation to the number of DE courses they had developed over the last 5 years.

Of the faculty who responded "yes" that the accessibility requirement made them less likely to develop DE courses, 120 provided explanations. Their answers focused on reasons that were not surprising: too much work, lack of time to develop courses, lack of resources or necessary support, lack of compensation, and the complexity of the requirements.

Table 25
In your estimation, how many students with disabilities are not taking distance education courses but want to?

	Frequency	Percent
None	7	6
A few	23	21
Some	25	23
Most	3	3
Don't know	51	47

Table 26
In your estimation, how many students with disabilities are taking distance education courses but would like to take more?

	Frequency	Percent
None	4	4
A few	26	24
Some	27	25
Most	6	6
Don't know	46	42

Table 27
In your estimation, how many students with disabilities would like to take more distance education courses in particular subject areas?

	Frequency	Percent
None	3	3
A few	21	19
Some	26	24
Most	7	6
Don't know	52	48

Many students with disabilities reported that they would be interested in taking more DE courses if they were accessible and navigable. When those students who had previously taken online DE courses (47% of survey takers) were asked if they would take more DE courses if they were accessible and navigable, 65% said "yes." Their responses did not vary greatly with

their disability, age, and GPA. Students who had *not* previously taken online DE courses were simply asked if they were interested in taking a DE course in the future, and only 21% said "yes"—although 49% said they were "not sure."

When asked what subject areas or courses students wished were offered in distance education, 90 students who had *not previously taken* DE courses provided suggestions. Of those, 32 either said "none," were "not sure," or indicated the question was not applicable to them. Some students who provided suggestions provided multiple ones, so there are more responses than the number of students who responded to the question. The most frequently cited were math (15), English (10), science (5), business (6), and foreign language (3). The remaining suggestions received 1 or 2 mentions: architecture, sign language, culinary, sociology, gardening, real estate, legal studies, Black studies, alcohol and other drug studies, economics, history, writing, computer, and CAD.

In response to the question about what subject areas or courses they would like to see offered online, 142 students who *had already taken DE courses* provided suggestions. There was clear interest in having more online courses. In fact, 16 students mentioned specifically that they thought all courses should be available as online courses. As one student noted, "My problem is I have to shop around from school to school to find the online or telecourse I need to finish my degree. Not all schools have a good distance ed program." The student went on to detail which colleges were "really good with distance ed variety," "okay," or "need more of a variety."

It is important to note that basic "core" subjects are mentioned most frequently. In general, the number of mentions fell into three frequency bands (and in the order listed):

9–21 mentions	**6–7 mentions**	**3–5 mentions**
Science	Child development	Sociology or social science
Math	Foreign languages	Human services
History	Health and nutrition	Humanities
English	Art	Music
Psychology		Anthropology
		Criminal justice
		Business

There was a list of courses that were mentioned 2 or fewer times: human development, nursing, medicine, speech, archeology, astronomy, geography, social work, ethnic studies, photography, law, astronomy, alcohol and drug abuse, law, ethnic studies, speech, education, writing, graphic design.

Students who had not taken DE courses were asked in an open-ended question what might encourage them to take a DE course in the future, and 138 students provided a response. After eliminating 20 who were "not sure," indicated "nothing," or did not provide useful responses, the remaining responses fell roughly into two levels of frequency. The most frequent responses (12–15 mentions) included two suggestions that would be relatively easy to address and that an overall plan for providing online education should feature. The first was that students wanted to be sure that the courses they needed would be offered or that they would be ones that would clearly lead to the award of a degree. The second was that many students wanted more information about online courses: what is offered, what is required, the difficulty level, and so on. The third most frequently mentioned factor that would encourage students to take a course was the availability of a computer (one student specified a laptop) and stronger computer skills. The latter would be a bit more of a challenge for the community college system to address, but not an insurmountable one.

In the second category of frequency (4–7 responses), student responses regarding factors that would encourage them to take an online course included knowing they would get the help they might need; discounted course rates; knowing the course would "count" and "have prestige"; periodic personal contact with the instructor and peers; lots of video; use of closed captioning; and the cost of gas or distance from campus. Three students provided responses that capture a lot of what they are looking for:

- The return on investment has to be good. I'd say if there is little cost, [if] books can be accessed online (e-books), if the course offers networking to have study groups, and if the school offers more computers at all hours.
- Keeping them simple and staying creative with the layout and structure of the online Web site or page. Most DSP&S students are visual learners, and we need pictures and colors to help us get it all together. But at the same time, it might be a great idea for some students and intimidating to others, depending on their disability.
- Being given credit for it. Knowing about the ones that are available, before registration period begins. Perhaps an e-mail alert from the school saying there are such courses available to me.

When faculty were asked if there was any additional information they wanted to share about access to DE courses, 93 responded. Because there was considerable variety and the responses did not result in modal frequencies, the quotes below provide a sampling of responses that are representative or give useful information:

- The survey is a good start on developing statewide initiatives. But, it is the local college that needs to have the commitment (i.e., funding, training, etc.) to ensure that the job gets done. Training that involves showing best

practices both locally (i.e., within the local college's distance ed program), as well as statewide exemplary programs, could help motivate faculty on improving courses. Plus, the statewide programs might help motivate the local college to invest resources to assist faculty in improving their online course.

- I'm all about making my classes accessible, but I won't teach distance ed again because it is not adequately supported at my college.
- Our distance ed department (Open Campus) is woefully under funded. Also, there are some concerns among the English discipline members regarding whether the distance format is pedagogically comparable to face-to-face classes that have made us slow to offer many courses or sections as distance.
- We have many issues regarding distance ed on our campus, not the least being accessibility. Even though there are mandates to create new offerings and increase enrollments, there is very little support for faculty to develop courses that meet the needs of everyone. If things do get done, it is only because willing faculty are doubling or tripling their load to make it happen. Unfortunately colleges need to realize that without tools and support, quality courses will be few and far between.
- I fully support these efforts and think it is enormously important. I must say, though, that with all the other tasks related to distance ed delivery, accessibility is often an afterthought. I really think DE and disabled student centers need to work together closely to meet the gold standard of accessibility for all students.

V. Summary

The results of the three surveys suggest that the situation for developing DE courses and making them accessible in the California Community College system at the present time would not be considered dismal, but there is a clear need for improving the system. Many of the survey items had decidedly mixed results when comparing responses from students, faculty, and administrators, while others provided clear indications of the current status with regard to support and barriers to development and participation. An important point is that the judgments made about accessibility of the DE courses were about the courses that are currently offered. There is evidence, however, that many of the courses do not make optimal use of the more advanced features that are possible with Web-based courses—either because many faculty developing courses do not have sophisticated knowledge or skills for developing them, or because they opt *not* to use certain features that are more difficult to make accessible. For example, faculty may choose not to include videos, podcasts, or external Web sources because of the difficulty of making them accessible. In addition, it is important to note that suggestions in the literature and from some of the interviews we conducted indicate that advances in technology are affording very sophisticated Web-based presentations that are outstripping the capacity for making them accessible.

Current Status of Distance Education Offerings in California Community Colleges

There has been dramatic growth in the number of courses offered: over 10 years, the number of courses offered by the community colleges collectively has risen from 1,257 distinct DE courses to 7,689. This number differs significantly by region. While this report did not focus on the development of hybrid courses, and some of our interviews indicated that many of these courses were being developed, the data we collected indicated that there were fewer hybrid courses offered and being developed.

Faculty Developing Courses

A large number of faculty were developing courses, rather than a prolific few developing many. Fifty percent of the faculty who responded to the survey taught 1–2 courses, 30% taught 3–5, and 10% taught 6 or more. The courses most commonly offered by faculty respondents were in the social sciences, English, and other subject areas. The subjects taught with the lowest frequency were in foreign language, history, and art. Students indicated that

they most often took the same courses most commonly cited by faculty, except that they also indicated taking math.

Students Enrolling in Courses and Their Reactions

The number of students who reported enrolling in DE courses was evenly divided, with 33% each reporting that they took 1 course, 2–3 courses, and 4 or more courses. Interestingly, older students and females were more likely to enroll in these courses. The likelihood of enrolling also varied with specific disabilities: the most likely group to enroll were those with a psychological or mobility impairment, while the least likely group to enroll were those with a speech or language impairment. Students with visual impairments were as likely to take 1 course as they were to take 5 or more courses. In terms of completion, the student responses were again evenly divided, but in fourths. One quarter enrolled in 1 course but did not complete it; and a quarter each completed 1 course; 2–3 courses; and 4 or more courses.

Fifty percent of students responding to the survey reported that the DE courses they took were just as interesting as on-campus courses; 28% felt they were less interesting; and 22% felt they were more interesting. Students with very high GPAs were slightly more likely (60%) to say that the courses were equally interesting. Similar to the relative interest of the courses, 50% of students reported that DE courses were just as easy to understand. The vast majority of students who responded to the survey reported putting in at least as much time, if not more, on their coursework when taking a DE course. Equal numbers felt that the content took more or equal amounts of time compared to classroom-based courses: 39% for each response. There was some variation again for students with high GPAs: they were most likely to report that online courses required less time.

Reports of Accessibility

Two-thirds of the students who took DE courses found them to be almost always accessible; 31% found them to be sometimes accessible; and only 5% found them to be never accessible. Students' perception of the accessibility of DE courses varied by their type of disability. Students with hearing, visual, speech/language, and mobility impairments were more likely to report that the courses were almost always accessible. Students with brain injuries, learning disabilities, and psychological impairments, as well as those who are developmentally delayed, were less likely to report that the courses were almost always accessible. When reporting on their own courses, faculty (40%) reported that 1–2 courses were accessible; 25% thought 3–5 courses were accessible; and 10% said 6 or more. Faculty thought their courses were accessible to a large extent for those with hearing, mobility, or speech/language impairments. They were least likely to report that they were accessible to a large extent for those who were psychologically impaired, those with acquired brain injury, and those with developmental delays. Slightly more of the administrators (50%) thought

that 76–100% of the courses were accessible, and more administrators (67%) thought that 76–100% of courses *being developed* were accessible, indicating improvement in the process as faculty and administrators gain experience.

Support for Development

Both faculty and administrators identified workshops, seminars, and courses, and technical and pedagogical assistance, as supports provided for development of accessible courses. They also indicated that colleges needed online tutorials, a manual, and more release time for faculty to enable them to carry out development tasks. To do these well, about 50% of the faculty indicated they needed to learn which elements require special treatment or to make content changes or enhancements. About a third of the faculty reported receiving incentives for doing the work.

With regard to the state guidelines, a large majority (94%) of the administrators and 50% of the faculty were familiar with the guidelines. Of those, a large majority (85% and 78%, respectively) found them to be very or somewhat helpful. It seems that their usefulness is somewhat limited, however, because only about a third of faculty reported using them almost always, and 50% used them sometimes. In addition, only about 40% of the administrators reported having local policies regarding making DE courses accessible. The lack of clarity over whose responsibility it is to carry out various tasks to make courses accessible, reflected in several areas of the survey, was also evident in response to questions about Section 508 standards.

Support for Students

Most faculty and administrator respondents indicated that there is support available for students on their campuses. Administrators and faculty reported that there is a help desk available to students (71% and 75% respectively) and remote supports such as e-mail, toll-free number, and web interface available as well (93% and 72% respectively). More than half of faculty were satisfied or somewhat satisfied with the assistance students received from DSP&S alternative media specialists, campus information technology staff, and campus DE coordinators. However, the percentages of respondents who completed the survey and responded to questions about student support were in the moderate range. Of students, 60% reported that they could reach DSP&S when they have a question or problem, and about 50% of faculty said they were satisfied with the support for students. Students also reported receiving support in using various forms of assistive technology.

Barriers to Development of Distance Education Courses That Are Accessible

Barriers that were identified ranged from insufficient funding to campus and individual issues. Most commonly mentioned by administrators were lack of awareness on the part of the faculty, lack of incentives, and difficulties with the approval process. Faculty, on the other hand, most commonly reported lack of proper tools, lack of time to update courses, and lack of technical support or guidance. Also mentioned by faculty were lack of useful guidelines, lack of time and incentives, and lack of funding. However, about half of the administrators and a third of the faculty did not see inadequate funding as an issue, while about a quarter of them did. The remainder did not know. Also related to funding, many of both administrators and faculty saw lack of incentives as a barrier to development.

An important finding concerning the barriers to development was a high degree of confusion about whose responsibility it is on each campus to make sure courses are accessible. For example, a third of faculty did not know which campus personnel determined whether the curriculum could be made accessible or was responsible for revising the curriculum after development to ensure accessibility. This finding is an example of the lack of clarity around the approval process on the campuses.

Barriers to Participation in Distance Education by Students with Disabilities

Students most commonly reported inadequate support from the instructor as the factor that discouraged them from taking online courses, though it was mostly students who reported their disability as a developmental delay or an acquired brain injury. Students did mention other factors that discouraged them from taking online courses such as personal family or health issues or—as many administrators and faculty also reported—lack of time management or study skills. Faculty and administrators also mentioned inadequate orientation or training for students. All three respondent groups also mentioned the fact that courses are not fully accessible.

Some also reported that students with disabilities need more support than other students with 35% and 40% of the administrators and faculty indicating such; on the other hand, about equal numbers indicated that students with disabilities do not need more support for DE courses than they do for on-campus courses.

Cost Issues

About a third of administrators and faculty think that there is insufficient funding for developing DE courses, and slightly more thought that there is insufficient funding for making them accessible. About half didn't know if the cost of making DE courses accessible compromised the quality of the courses they could otherwise offer.

Demand for Online Courses

It is clear that there is still some unmet demand for DE courses in the community college system. The faculty who responded to the survey would like to see more DE courses offered—bearing in mind that the faculty members who took the survey are those who are already developing and teaching them. They did not report that they are deterred from doing so by the accessibility requirements. Sixty-five percent of the students who had taken DE courses said they would take more if they were accessible. In response to a question about what would make it easier for them to take DE courses, they identified better availability of the instructor, time accommodations for tests, and increased technical support. For those who had not taken any DE courses, they mentioned that they would take them if the courses they needed were offered, if there was more general information about online courses, and if they had access to a computer.

VI. Discussion and Recommendations

The Impact of Technology on Future Distance Education

While there is an explosion of media-rich content in distance education requiring that course content be created and delivered as a complex product developed by a collaborative team of content and technical specialists, the question remains as to how much this format will become the norm. This is not the first time that technology-related content has invaded the classroom. Filmstrips with and without accompanying audio and video courses come to mind. While today's media-rich content is clearly much more engaging than it was in the past, it still tends to interfere with the student-teacher relationship. It not only changes the nature of teaching in such courses but also changes the nature of teaching and learning. Is learning primarily measured by the extent to which students engage with content, and how much does learning rely on personal engagement between the teacher and the student? Teaching that occurs in a technology-based environment does not have to be impersonal.

Depending on the technology used and on the teacher, many find that technology-based teaching provides a richer context for personal relationships. Arguably, there will always be an important place for both teaching that focuses on individual and group relationships between people and learning that focuses on the student engaging with media-rich content that reduces person-to-person interactions.

At the same time that technology designers are developing tools to deliver richer multimedia content, they are adding authoring software to make providing such content easier for individuals with limited technology ability. Increasingly, authoring software is providing a "what you see is what you get" interface. They are also including "wizards" to lead the content author step-by-step through a complex process without him or her having to understand much about the actual process of creating multimedia. More faculty are becoming more technology savvy and creating more of their own media. While this new capacity will not remove the need for a team of technology experts, it opens up the possibility of integrating some multimedia into a course that focuses on teaching as a person-to-person activity, rather than having teaching become an impersonal one-way vehicle to deliver multimedia content. Clearly, as these advances are made, and online content becomes more sophisticated and engaging, the need to ensure accessibility for all students becomes more pressing.

In reviewing background literature and considering the issues identified by the Systems Office as we initiated work on this needs assessment—and along with our analyses of the results—three important principles stood out. One comes from the National Center on Accessible Distance Learning (AccessDL). In addition to finding that the Center provides very useful resources, we took special note of their advice: "Project staff found that planning for access as courses are being developed is easier and therefore less expensive than redesigning inaccessible courses or developing accommodation strategies one a student with a disability enrolls in a course" (Burgstahler, Corrigan, & McCarter, 2005). A second principle we found reiterated throughout the literature, including by one of the authors noted above, is that "making courses accessible to students with disabilities promotes best practices for all students" (Kinash, Crichton, & Kim-Rupnow, 2004; Opitz, 2002; cited in Burgstahler, 2007). Third, the solution to providing access to the Web or to online courses is not to create boring pages or courses (by keeping them so simple that accessibility is not as much of an issue), but to encourage the use of Web design tools to create attractive and compelling pages and courses while still providing maximum accessibility for users with a wide range of disabilities (Coombs, 2008).

In an excerpted version of an Issue Paper (Feb. 14, 2008) provided to MPR Associates for purposes of the needs assessment by the California Community Colleges Chancellor's Office Disabled Students Programs & Services. Unit as background documentation for this study, three concerns were raised that stand in some tension with one another:

- Providing for cost containment;
- Delivering high-quality, state-of-the-art online content; and
- Providing online content in a format that is fully accessible to students with various disabilities.

To these concerns, we would now add four more, in acknowledging the need to balance a wide range of concerns:

- Defining the roles and responsibilities of specific local and systemwide players more clearly;
- Providing DE faculty and staff with online accessibility training and providing orientation and more technical support to students;
- Allocating funds in ways to support CCC system and DE goals; and
- Defining systemwide DE policies more clearly.

Cost Containment

Considering today's federal and state financial problems, it is essential to think about cost containment and about allocating existing funds in the most cost-efficient ways possible. While we wait for the financial picture to change, decisions must be made today or in the near future to ensure that all students' learning needs are being met as the demand for distance education continues to grow.

In general, we have learned that the question of adequate funding and cost containment is a very complex one. The actual cost of making a Web site or an online course accessible includes figuring out the costs of a wide array of resources—Web-authoring tools, learning management systems, transcriptions, captioning, to name just a few. In addition, there are other costs associated with technical support, training, policy development, and so on. It is our intent to disentangle and specify these costs with a little more precision in Part II of this report, to be completed in fall 2008. In the meantime, we can offer several suggestions based on the results of this needs assessment.

One suggestion we would make is that when it is feasible, decisions on significant purchases should be made by a systemwide body. Instead of colleges purchasing a number of similar products, if one or two similar programs were purchased through a central office, vendors could more likely be persuaded to discount those items. For example, different

Data on Use of Course Management Systems in Community Colleges

The 2007 survey results by the Instructional Technology Council showed that 77% of the respondents use Blackboard/WebCT for their CMS, a 7% decrease from what was reported in the 2006 survey. However, the use of Moodle increased from 4% to more than 10%, and Angel increased from 5% to more than 9%. In addition, 35% of respondents indicated they were considering switching platforms in the next few years.

colleges use different course management systems (CMS). There may be important reasons to purchase more than one CMS depending on what features each system contains, but it would seem reasonable that the CCC System Office should oversee which systems are purchased and use its potential bargaining power to its advantage. Limiting the number of products will also cut the costs of support staff. Besides considering the cost for a CMS system, key decision makers can give priority to the accessibility features provided by each CMS.

Similarly, there are a number of software products that can be used to create documents, Web pages, audio, video, captioning, and much more. Purchasing different versions of each tool can be costly as well as complicate the process of providing technical support and training them. If systemwide decisions were made as to which products would be supported, it could help cut purchasing and support costs. The accessibility of the output of those tools, as well as the accessibility of the tool itself, should be important factors in making decisions.

At large colleges or universities, basic courses are frequently taught in very large classrooms with formal lecture by, it is hoped, an engaging presenter. Then, these large lecture groups are often split into smaller discussion sections taught by teaching assistants. Basic courses are a significant part of the total number of online courses in the CCC system. These courses could be adapted to state-of-the-art, media-rich online presentations including video, while also permitting individual students to interact in some way with that media. This media-rich content could be created by a CCC team of developers or the courses might be developed by an outside provider. The format would probably involve less personal interaction with a teacher, but it should continue to permit some form of personal contact. In cases where campus sections of large courses are limited by room size, providing rich media online can be delivered to an audience of any size. The beginner courses could control costs because of the size of classes. More advanced courses might be smaller as a rule and also focus more on personal contact.

Delivering High-Quality, State-of-the-Art Online Content

While the cost of many computer-related items, such as disk storage, seems to be dropping steadily, new technologies are continually emerging that require the expense of constant upgrades and new purchases. This fact raises a dilemma in that it is not always wise to be the first to invest in and introduce a new technology in programs or educational systems. Often there is a need for additional debugging or to wait for the price to go down as the product develops a mass market. How important is it to be on the cutting edge? Those most invested in technology like to get the newest thing on the market or to get the most recent upgrades. While there is no right answer to this question, it would seem to make sense for a system to make decisions from a different perspective. The system is making a major purchase. Does a new version of a product do anything new that is important or that would be used by the

CCC system? An old familiar saying is that "Pioneers get arrows in their backs." It suggests that pioneers take risks with products not fully tested or developed and that waiting until a product is thoroughly tested makes sense. Some technical types want to be out in front and enjoy taking risks. A system probably should be a little more cautious even while it also tries to keep up with state-of-the-art technology. This technology is almost always released before it has taken accessibility issues seriously. Given enough complaints, many developers add the accessibility features for the second or third release.

Some technology purchases require significant costs for maintenance and even more for support and training for its users. In such cases, the peripheral costs and staffing connected with new technologies need to be evaluated as part of the decision-making process.

Another important consideration related to the development of high-quality content is the development of awareness and skill in faculty—to understand what is possible and how to bring it about—with technical support. While many of the faculty reported having access to technical support, many did not think it was adequate for their needs—and certainly they were not thinking about how much might be required if they really knew and could develop courses at an optimal level of possibility.

Sheryl Burgstahler and her colleagues at the University of Washington Accessible Technology Services and Outreach project make a number of recommendations regarding the accomplishment of accessibility goals for DE courses. One is to "design courses to address accessibility from the outset, before any material is even written to assure full access to course materials for prospective students." They also note that instructors who teach with the materials should not need to be familiar with all practices of universal design. While there are different schools of thought and confusion within the CCC system about responsibility for design and ensuring accessibility, a clear policy and set of procedures should be established to address the issues in an effective manner.

Providing Online Content That Is Accessible

Accessibility is much more complex than it might, at first, appear. While there are standards that can be measured to some extent, it is not clear which of them are more important or how many of them have to be met to have something be evaluated as accessible. In a 2002 paper by Coombs, for example, he discusses the use of Bobby, an accessibility checker developed by the Center on Accessible Special Technology (CAST) that represented one quantitative way (no longer available)[22] to apply either the WAI guidelines or the 508 standards. Bobby only evaluates objective elements of a site and typically, therefore, provides conservative estimates of full accessibility. A sampling of campus Web sites that Coombs

[22] Two free online checkers now available are the Wave and Cynthia Says.

studied in 2002 found, for example, that a random sample of 400 colleges, universities, and online learning institutions revealed only 22% of them had home pages that would receive Bobby approval. While we know that things have improved since then, the use of such tools and a careful consideration of what constitutes accessibility is important.

Providing online content that is fully accessible to students with a wide range of disabilities is surely a daunting task. The fact that there is a wide range of disabilities to be accommodated is further confounded by other realities such as a student's time management and study skills and his or her level of computer literacy.

What is accessibility? Frequently, we think in either/or terms. The development of Section 508 of the Rehabilitation Act was aimed at defining accessibility standards that would assist courts in reaching legal opinions on a product's accessibility. If a large Web page has everything meeting the 508 standards with the single exception of one image lacking a text label, does it fail the accessibility test? If a courseware system is technically sound except for one to two small items, should a college refuse to purchase it? If one major item such as a white board is a serious problem, should a college purchase the system but direct the faculty to avoid using that feature?

The 508 standards are technical standards. It is possible for a product to meet those standards and at the same time cause significant problems from a user's perspective. However, in many cases, the accessibility as well as the usability can be partly a function of which parts of a system are used and how the system is used. Some presenters want to have the participants focus on the presentation and tell people not to use text chat, personal or public, during the presentation. In this case, the context mirrors a face-to-face classroom. If the audience is talking during the presentation, it distracts everyone. Someone with poor hearing would find it more confusing. Someone with some learning disabilities might also find it a real problem.

One Person's Experience with Accessibility

I participated in a Webinar, and the vendor claimed to meet the 508 standards. When I entered the online room, my screen reader told me there were 17 frames and 25 links. I could tab to all of them, and each one was identified by the screen reader. Navigating those 42 tab keystrokes was overwhelming. The help information listed a number of hot keys to facilitate navigation. Learning and remembering all of them was another problem. Then, I could hear the presenter talking. My screen reader also chattered away verbalizing what was on the slide the presenter was pushing. In the middle of that, my screen reader read a personal text message someone sent to me wishing me well. So while all these messages were continuing, I tried to locate the name of the person who sent me the message and then highlight it and find the button to let me write and send a message to my friend. I found it impossible to handle all of this at once. It was technically accessible, but it was less than usable. So usability needs to be considered as part of accessibility. I understand that courts might want to avoid this, but in evaluating distance education systems, usability needs to be at least considered.

The CCC system is committed to following the Section 508 standards. It is clear that applying these standards may frequently require some judgment about how to interpret and apply them in specific instances. If that is left to the individual faculty, staff, or college, the

result will be confusing. The central office needs to provide some direction and guidelines. The HTCTU staff are very knowledgeable about accessibility, and their opinions and support seem to be valued and appreciated, but it is unclear how much impact they can have on their own. They should be a key part of any central decision-making process.

When CCC purchases hardware, software, or courseware, it should have a strict policy of only purchasing items that conform to the 508 standards. Those standards do allow for exceptions when they are justified. This should include courseware systems, authoring tools, and more. Courses developed online should require the course creator to state that accessibility has been included in its development. Policing accessibility of all online courses is challenging, and it may also become burdensome and costly. If the people involved at least submitted a form acknowledging that they strove to achieve accessibility that might have some impact.

Student Responsibility for Distance Learning Accessibility

There are two other aspects of making online learning accessible for students with disabilities that are often overlooked. Adaptive computer technology can increase the independence of the user. For many, this is exciting and liberating; for others, it is frightening and alienating. Some people with disabilities have developed "learned dependence" to use a modern psychological label. It is true, and this is one reason some students with disabilities do poorly in DE courses and why they avoid them. Another problem is that if students require adaptive technology to use the computer and if they have not mastered that technology, they may have difficulty navigating the online system and understanding its content.

Accessibility legislation makes it clear that a college is mandated to provide training on adaptive technology on college computers. It is not clear, however, that the college is required to train a student on the adaptive technology on that student's own computer especially when the student is not on campus. Even so, the CCC system should have established a policy on whether this training is available. There may also be a place where a student with a disability can go for on-campus or online training on the adaptive technology and using the course interfaces.

Defining Roles and Responsibilities

We found that a wide range of people within the CCC system are involved in issues surrounding distance education and its accessibility. Particularly on the local campuses (several of which we visited), we found that there were many with different titles and responsibilities from campus to campus. These people include DSP&S staff, IT staff, DE staff, alternative media specialists, high-tech training center staff, central office staff, and

faculty with a wide range of knowledge and skills. We believe that it would be of great advantage if the responsibilities of each person were defined, and, to the extent possible, that there should be consistency across the system regarding the responsibilities of the various individuals. There are different ways to organize the relationships, but it would seem best to do so as a group process so that all players will be more likely to buy into the organizational framework.

Providing Faculty and Staff Support and Online Accessibility Training

Many faculty and staff reported that they benefited from the technical support and training that was available to them, but many also indicated the need for more support. As the demand for and effort to develop DE courses continues to grow—as is widely believed it will—there clearly will be need for more. On some campuses, the need is evident now. On one campus we visited, for example, the single multimedia specialist was spending an inordinate amount of time creating transcripts for videos. Not only are additional support staff needed, but also a clear policy for accomplishing such tasks should be established.

As was noted by many with whom we spoke throughout the system, the High Tech Training Unit provides excellent faculty and staff training on accessibility in regional face-to-face settings. Faculty at some campuses have taken more advantage of these opportunities than have faculty at others. The number of faculty who participate—in this training as well as other training provided on individual campuses—is often reported to be disappointing. Whether this is due to a lack of faculty awareness or perception of relevance, or just to lack of time, is not clear, but there is a definite need for additional training and support. In the Issue Paper mentioned earlier, there was a recommendation for the development of a Web-based training model to assist colleges in developing online courses that are fully accessible from the course's inception. It seems that the HTCTU staff have the skills to develop such a model. There are various models that could be pursued: one would be to use Webinar-type tools to provide live, interactive training presentations. This has the advantage of being interactive and of permitting the faculty and staff to participate in the training either at work or at home. Another model is to provide training in the form of very short modules available on the Web—each on a specific accessibility topic explaining and demonstrating the skills required to produce accessible online DE content. This has the advantage of any time, anywhere learning.

The face-to-face regional training should also be continued. Colleges should look for ways to encourage faculty to use these opportunities and even reward them for taking the initiative to develop these new skills. The central office should consider what it could do to encourage more faculty and staff to participate.

Keeping It Simple

Many faculty and staff content providers have limited computer skills and have little interest in learning any more technology than the minimum needed to do what they have to do. Technology, for them, is the means to the end of delivering course content and not the end in itself. Others have more know-how and are eager to learn some more advanced technology features. One-size training will not fit all. There needs to be beginner- and intermediate-level skill training opportunities.

The more that faculty can be shown how to use content authoring software that they know and use regularly and use it in ways that promote accessibility, the more likely they will be to work to provide accessible content. The document structure feature built into the styles feature of Microsoft Word, for example, interfaces well with adaptive technologies. When the structure is accomplished by using styles—besides being compatible with screen readers and other adaptive software—the structure can be exported from Word into other document formats and maintain its accessibility. The training approach should start with what faculty and staff already know and show them how to use tools to create accessibility in formats with which they are not familiar. Earlier, we raised the question of how perfect accessibility needs to be to qualify as being accessible. In most cases, this is a judgment call. If the inaccessible items do not interfere with learning the actual content, then perhaps it is only a marginal issue.

Keeping it simple is also promoted in such guidelines as those produced by the working group that produces the Web Content Accessibility Guidelines (now WCAG 2.0). To reach the greatest number of users possible, it is best to write clearly and simply and design the interfaces to be consistent from page to page. Many people with cognitive disabilities can fail to understand material that is presented to them simply because it is not laid out well.

Allocating Funds to Support CCC System Distance Education Goals

Providing specific recommendations in this regard really requires someone with an in-depth understanding of the budget and procedures/requirements for allocating funds. Providing funds for the creation of new courses, however, might have special earmarks for accessibility. There may be other ways to reward people who contribute effectively to increasing DE accessibility besides financial rewards. Such work could be considered for merit pay or promotions, but this would require consultation with those who are most familiar with policies and mandates. We hope to gain additional understanding of these issues as part of our follow-up investigation of costs associated with developing DE courses and making them accessible. Suffice it to say at this point that careful consideration should be given to the establishment of policies related to the allocation of funds.

Defining Systemwide Distance Education and Accessibility Policies

There is a pressing need (and this is an ideal opportunity) for the System Office staff to consult and work with those throughout the system addressing DE accessibility to provide more and clearer direction for this large system of colleges. There is no question that getting a handle on DE courses delivered on more than a hundred campuses, staffed by hundreds of faculty, and supported by hundreds of DE, DSP&S, and IT specialists is daunting. But as one interviewee noted in a conversation with us, "It's like the wild west out there." There is clearly need to bring some order to the situation. Each campus has obviously developed its courses with a significant degree of independence and isolation from the other campuses. Even more challenging is the fact that faculty are highly independent and accustomed to developing courses autonomously and with a minimum of organization and supervision, and faculty usually are resistant to having organization imposed on them. An effort to impose some logic and organization to the development of DE courses because of the need to ensure their accessibility is surely a major undertaking, and it will require policies that will increase order while leaving room for local and individual independence.

The University of Washington Accessible Technology Services and Outreach project recommends establishing clear policies and procedures that address both universal design and accommodation issues and that they be featured prominently in information given to current and prospective students, faculty, and distance learning course designers. The project also conducts (and recommends) a "four-staged Quality Assurance Review including a peer or subject matter expert review, an instructional content review, a Web page review, and a final technical review." The final three processes include standards on accessibility. They also use checklists developed from the World Wide Web Consortium's (W3C) Web Content Accessibility Guidelines as well as automated coding validation tools to check technical issues. Such a review process should also be considered in developing policies for guidance and support.

The CCC system has been on the right track by adopting the Section 508 standards and disseminating guidelines for ensuring accessibility. Now there is a need to take these resources a step further to establish policies and procedures for course proposal, development and workflow, review, and approval. We believe that these policies should grow out of a consultation involving the key players. While this may be a poor time to attract support through significant budget increases, the future direction can hold promise for what will happen when finances improve, and some changes can be made for relatively modest cost. Even without increased funds, it is undoubtedly possible to allocate funds differently, in ways that will enhance accessibility.

Conclusion

The California Community Colleges have a national reputation for taking the needs of minority students seriously, including the accessibility needs of students with disabilities. The Systems Office staff demonstrates a clear desire to work with their campuses to help them improve. The High Tech Center Training Unit is clearly a national leader. The staff keeps up on the cutting edge of technology and is keenly aware of the accessibility issues in such new technologies. In spite of the problems created by tough national and California finances, we are certain that the goals of increasing the accessibility of CCC online courses, of increasing the participation and success of students with disabilities in these courses, and of intelligently managing costs in such a large undertaking will be achieved.

References

Blackorby, J., and Wagner, M. (March/April 1996). Longitudinal postschool outcomes of youth with disabilities: Findings from the National Longitudinal Transition Study. *Exceptional Children*, 62(5), pp. 399–413.

Brown, Carl and Sean Keegan, High Tech Center Training Unit, "Container, Content, and Capability: The Three C's of Accessibility and Distance Education." (n.d.) http://www.htctu.net/publications/articles/three_Cs_111804.pdf

Burgstahler, S. (2008). Working together: People with disabilities and computer technology. Seattle Washington: DO-IT; University of Washington.

Burgstahler, S. (2007). Accessibility training for distance learning personnel. Retrieved April 10, 2008 from http://athenpro.org/node/56.

Burgstahler, S., Corrigan, B., and McCarter, J. (2005). Steps toward making distance learning accessible to students and instructors with disabilities. Retrieved April 12, 2008, from http://www.rit.edu/~easi/itd/itdv11n1/brgstler.htm.

Burgstahler, S. (2004). Universal design: Principles, process and applications. Retrieved March 17, 2008, from http://www.washington.edu/doit/Brochures/Programs/ud.html.

Burghstahler, S. (2002). Working together: People with disabilities and computer technology. Retrieved March 24, 2008, from http://www.washington.edu/doit/Brochures/Technology/wtcomp.html.

California Community Colleges Chancellor's Office. (1999) Distance Education: Access Guidelines for Students with Disabilities. Retrieved on July 18, 2008 at http://www.htctu.net/publications/guidelines/distance_ed/disted.htm

California Community College System Office. (2008) Data received from MIS Department on July 15.

Coombs, N. (2002). Electronic ramp to success: Designing campus web pages for users with disabilities, *Educause Quarterly*, 25(2).

Coombs, Norman (2007). "Barrier-free e-learning handbook," Equal Access to Software and Information (EASI) http://www.rit.edu/~easi/

Coombs, N. (2008). Personal correspondence.

Erickson, W., Trerise, S., Lee, C., VanLooy, S, and Bruyère (June 2007). Web-based student processes at community colleges. Ithaca, NY: Employment and Disability Institute, Cornell University.

Frank, K. and Wade, P. (January1993). Disabled Student Services in Postsecondary Education: Who's Responsible for What? *Journal of College Student Development*, 34(1), pp. 26-30.

Hart, K. (2008) "Access denied: the blind or deaf can feel left behind as the tools of technology advance." *Washington Post*. 19 June, p. D1.

Henderson, C. (2001). College freshmen with disabilities: A biennial statistical profile. Washington, DC: American Council on Education.

Horn, L. and Bobbitt, L. (1999). Students with disabilities in postsecondary education: A profile of preparation, participation, and outcomes. Washington, DC: NCES.

Kinash, S., Crichton, S., & Kim-Rupnow, W.S. (2004). A review of 2000-2003 literature at the intersection of online learning and disability. *The American Journal of Distance Education*, 18(1), 5-19.

Nather, K. (July 2007). *Distance Education Report: Fiscal Years 1995-96 through 2005-06*. Retrieved July 18, 2008 from the CCC System Office website http://www.cccco.edu/SystemOffice/Divisions/AcademicAffairs/DistanceEducation/Reports/tabid/768/Default.aspx

National Council on Disability (2000). Federal policy barriers to assistive technology Washington, DC: Author.

Opitz, C. (2002). Online course accessibility: A call for responsibility and necessity. *Education Technology Review*, 10(1).

Schmetzke, A. (2001). Online distance education – "Anytime, anywhere" but not for everyone. Information Technology and Disability Journal, 7(2). Retrieved March 17, 2008, from http://www.rit.edu/~easi/itd/itdv07n2/axel.htm

U.S. Department of Education, Office for Civil Rights (OCR) September 18, 1996 letter to California Community Colleges. Accessed on July 18, 2008 at http://people.rit.edu/easi/law/ocrsurltr.htm

West, M., Kregel, J., Getzel, E., Zhu, M., Ipsen, S., & Martin, E. (1993). Beyond Section 504: Satisfaction and empowerment of students with disabilities in higher education. *Exceptional Children,* 59(5), 456-467.

Waddell, C. (1999) Technology changes but civil rights do not. Retrieved April 12, 2008 from http://www.icdri.org/CynthiaW/state_gov_tech1.htm.

Yelin, E. H., & Katz, P. P. (1994a). Labor force trends of persons with and without disabilities. *Monthly Labor Review*, 117, 36-42.