A Comparative Study of Services to Disabled Students in Public Colleges and Universities in the United States and in Massachusetts

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Abstract: For students with disabilities in postsecondary education who need services in order to complete an academic program, the disabled student center is critical. There are, however, no comparative studies of the characteristics of these centers and the services offered by them. This article, using a national sample and a Massachusetts sample, describes and analyzes the characteristics and the services offered by public colleges and universities and concludes with regression models exploring some of the relationships found along with a comparison of public institutions in Massachusetts and nation wide.

For disabled students in postsecondary education who need specialized services, the center for disabled student services which offers them can be crucial to academic success. This article examines a number of characteristics of the centers in public colleges and universities in the United States and in Massachusetts as well as the services offered. Although the data is a decade old, it still offers insight into services available to students with disabilities. Regression models are presented to explore some of the relationships found. The article concludes with a comparison between the centers in Massachusetts and the rest of the United States.

An extensive review of the early literature is found in Jarrow (1987). As she notes, centers appeared quite rapidly from 1975 to 1985 with little grounding in any discipline for guidance. Neither habilitation nor rehabilitation services sufficiently resemble the necessary services to post-secondary students with disabilities and so could not be the model to follow. There were no training programs and no precedents for the establishment of centers for disabled student services in higher education. Scales (1988) lists the starting year for 71 centers. Excluding the hoary pioneer begun in 1948, 70% of the centers in public institutions began during the period of 1975-85. For the private institutions 88% of them began during this time period.

Although Jarrow (1987) did an exhaustive search of the literature, she found few comparative studies of services back then. One of them, Marion and Iovacchini (1983), found that

administrators at various colleges in the early 1980s were trying to respond to the need and the legal mandate. Another, Warnath and Dunnington (1981), found that much more remained to be done. Most of the service related studies which Jarrow (1987) reviewed described how centers were begun and not the services offered.

Another body of work reviewed by Jarrow described specific strategies for specific problems, especially for learning disabled students. The largest group of studies examined the disabled students themselves. (Babbitt and Burbach, 1989) Again, learning disabled students received the largest share of attention and they continue to receive attention such as Siperstein (1988) and Farrell and Harckham (1988). However, after her review had concluded, some comparative studies did appear.

Sergent, Carter, Sedlacek, and Scales (1988) analyzed a five year period (1982-87) using the Disabled Student Services Data Bank. Their findings, reported mainly as trends, generally support those reported below which use (in part) the 1988 information from the same data bank. Kuik, Hausken, and Longman (1985) surveyed institutions which were members of the Christian College Coalition and obtained a sample of 46 (73% return). They wanted to know if member schools had taken steps to provide services. Their conclusions were affirmative.

Sampson (1984) surveyed the members of the Association on Handicapped Student Services in Post-Secondary Education (AHSSPPE), now named the Association on Higher Education and Disability, on the provision of specialized career services. With a sample of 107 (27% return) she found that 68% of the centers provided the services although there was considerable variations. Bumba and Goodin (1986) surveyed members of AHSSPPE about the appropriateness of academic adjustments made for students with learning disabilities. With a sample of 255 (44% return) they found considerable agreement on several issues. Friedman (1993), in an article related to services and which focused on accommodations for employees in the State University of New York system, carried out interviews which revealed that in 49% of the cases the employee did not know of the accommodation or service provided by the institution.

However, as of 2001 there are no studies published comparing the total service package offered by disabled student centers. This article is unusual in that it compares services offered by a national sample of centers in public institutions along with a sample from Massachusetts of centers in public institutions. Because the information is not available elsewhere, considerable descriptive material is included.

Two sources of data were used in this study. The first comes from the Taskforce on Disabled Student Services of the Massachusetts Board of Regents of Higher Education (Schein and Pfeiffer, 1989) which surveyed the public community colleges, public four year colleges, and public universities in the state in 1988. The Board of Regents was abolished in 1991 and was replaced with a statewide Higher Education Coordinating Council.

Not all of the state's institutions of post-secondary education returned the Board of Regents' survey. Out of the 15 community colleges, 14 returned their surveys. Out of nine state colleges, seven returned their surveys. Out of four state universities, three returned their surveys. The survey received from the state's only public medical school was not usable. With a sample of 24

out of a population of 29 there was an 83% return. With such a high return rate and such a low number in the sample, the calculation of a sampling error was not very useful. The inclusion of the other institutions will not change the percentages very much. Some of the figures - such as the total number of staff and disabled students - would change, but variations in the means and standard deviations would be minimal.

The other source of data (Scales, 1988) is from the Disabled Student Services National Data Bank which was described in Sergent, Carter, Sedlacek, and Scales (1988). The entire sample consists of 71 post-secondary institutions which responded to an invitation to participate for the academic year 1987-88. Eleven of these institutions were private ones and four were described as "other." Since the Massachusetts data covers only public institutions, these 15 private and "other" institutions were not used. In addition, there were no Massachusetts and no Canadian schools included in the national sample of public institutions. (Scales, 1989) Because the nature of the population was not known - and in fact was one of the reasons for starting the Data Bank - the calculation of a sampling error would not be helpful. The 1988 data is used in order to be comparable to the Massachusetts data.

Not all of the questions asked by Scales (1988) were asked by Schein and Pfeiffer (1989) and vice versa. There were about fifteen questions common to both surveys and another six which were similar. Some of the Massachusetts results not found in Scales (1988) were included in this paper because they present a picture of a state system in a way that the national sample findings do not. The overview of the characteristics of Massachusetts centers can be extended, with caution, to other states.

After discussing the general characteristics of the centers as found in the samples, the services offered by the centers are analyzed. Sources of funding, levels of campus accessibility, and advocacy with faculty and staff are next considered. Using data available only for Massachusetts the transition process from high school to college and the center's role in it are covered. Next is discussed the role and availability of adaptive technology on Massachusetts' campuses. The paper concludes with a comparison of centers nation wide and in Massachusetts.

Center Characteristics

The general characteristics of the two samples can be found in Table One. The national sample had a larger percentage of four year colleges and universities reflecting Massachusetts' history of post-secondary education. In Massachusetts private colleges were established long before the late nineteenth century concept of publically supported and controlled institutions appeared. Approximately half of the post-secondary institutions nationally were under public control while only 28% were in Massachusetts. In California 49% and in Texas 63% of colleges and universities were under public control in 1988. (Peterson's, 1992) As a consequence, in Massachusetts the public institutions were more likely to be community colleges because they appeared primarily since World War II and were mainly under public control.

Nationally 74% of the institutions had a director who served from 76% to full time in the position. For the Massachusetts sample, 88% had a full time person responsible for services to disabled students, but 54% of them spent 50% or less of their time on these services and the

largest number (42%) spent less than 26% of their time on the delivery of such services. The differences are statistically significant (using chi square and an alpha level of 0.05 which is what will be done whenever frequencies are compared).

The mean number of personnel who deliver services to disabled students was a little over four per campus in both samples with a range from one to 25. The differences between the means for Massachusetts and the US were not statistically significant (using a two tailed t-test with an alpha level of 0.05 which is what will be done whenever means are compared). In both the national and the Massachusetts sample, community colleges had larger staffs. In Massachusetts 54% of the center directors were women while nationally 68% of them were. The difference was not statistically significant. This data is presented in the Appendix in Table One.

The mean number of disabled students per campus in Massachusetts was 124 while nationally it was 182. The group with the largest mean number per campus were learning disabled students followed by mobility impaired, hearing impaired, and visually impaired students. The differences between Massachusetts and the national sample were all statistically significant except for the learning disabled students. The lack of a significant difference reflects the wide range in Massachusetts (from none to 510) and the more narrow range nationally (from three to 175). These numbers conform to the experience of most persons who work in the centers. This data is presented in the Appendix in Table Two.

A number of regression models were examined to determine what variables were related to the amount of time spent by the center director on the delivery of services. A categorical variable measuring the time spent was converted into an interval variable using the mid-points of the categories. In the national sample two variables were found to be statistically significant using a t-test and an alpha level of 0.05 as will be done for other regression models. Other possible variables were rejected on the basis of not being statistically significant. The best model was as follows.

National Sample

$TIME = 0.67TYPE + 0.32STAFF$

$R\ SQUARE = 0.77\ P < 0.00005$

For every additional staff member the time spent by the director went up by about one third of one percent. Even more influential was the type of institution with the four year colleges and universities (merged together into one category) having a tendency to have the director of the center spend more time delivering services than the community colleges. However, in the Massachusetts sample, time spent was simply a function of the total number of disabled students on campus. No other theoretically significant variable had a statistically significant relationship with time spent by the director.

Massachusetts Sample

TIME = 0.81TOTAL

R SQUARE = 0.66 P < 0.00005

Every additional disabled student resulted in an 0.81 percent increase in time spent. Not only must these two models be viewed cautiously because the variable time was converted from an ordinal variable, but also the variable has a ceiling in that no director could spend more than 100% of the available time supervising the delivery of services.

Regression models were also reviewed in order to explain the number of disabled students on campus. Although factors outside of those tapped in the survey probably had the greatest influence on the total number, an acceptable model was found for each sample.

National Sample

TOTAL = 0.56ACCESS + 0.28STAFF

R SQUARE = 0.60 P < 0.00005

Massachusetts Sample

TOTAL = 0.81TIME

R SQUARE = 0.66 P < 0.00005

On the national level the degree of accessibility (discussed later) as well as the number of staff were related to the total number of disabled students on campus. In Massachusetts the relationship was with the time spent by the director which was just discussed. Even though this model is statistically significant and explains two thirds of the variation in the dependent variable of total number of disabled students, it may have little theoretical significance. It seems more plausible to say that the number of students causes the amount of time spent by the director instead of the other way.

Finally, regression models were examined in order to determine what causes the size of the staff. In both samples the staff size was related to the existence of students with certain disabilities on campus.

National Sample

STAFF = 0.36MOBILITY + 0.25HEARING + 0.28PRIVATE$

+ 0.25OTHER$

R SQUARE = 0.66 P < 0.00005

Massachusetts Sample

STAFF = 0.62HEARING + 0.38LD

R SQUARE = 0.76 P < 0.0005

Nationally, four variables shared almost equal influence on the size of the staff with mobility impaired students having the largest influence. However, about half of the influence comes from the existence of non-public funds. Private funds were monies from private sector entities like corporations. Other funds were from things like competitive grants. In Massachusetts it was simply the number of hearing impaired students and learning disabled students which influenced the number of staff members.

Services

There were variations found in the services offered to disabled students by centers. Almost every center in the national sample offered sign language interpreters for the classroom, but only 54% did in the Massachusetts sample. The difference was statistically significant. Almost all of the centers in both samples offered the services of note takers, offered modified exam administration, and did advocacy with faculty and staff while very few provided personal care assistants and adapted transportation. In Massachusetts most centers provided books on tape, large print materials, curriculum modification advice, information and referral services, and pre-admission advising.

In the Massachusetts survey opportunity was given for the listing of additional services which were provided. They included in-coming basic skills assessment, post assessment advising, a self-paced curriculum, adjustment and career counseling, workshops, tutors, training for faculty and staff, a lab for math, reading, and writing, tours of campus for orientation, and job placement.

The Massachusetts respondents were also asked to identify major challenges associated with the provision of services for students with disabilities. In almost every case lack of funds was cited as a major challenge. Other challenges were faculty and staff attitudes, lack of support from the rest of the institution, lack of awareness by the disabled students of their own abilities, lack of social adjustment skills on the part of disabled students, lack of equipment, inaccessible buildings, lack of paid and volunteer assistance, lack of time, and an open admissions which produces high risk students.

A number of diverse strategies for meeting these challenges were recommended by the Massachusetts respondents. They included: more funds, more trained staff, a newsletter, social events, workshops directed at the major problems, more faculty, staff, and student involvement with the center, commitment by the Massachusetts Board of Regents and legislature to deal with the problems, cooperation from the sponsoring agencies, better transportation, mandatory assessment and placement of incoming students, more advocacy, and disability studies courses.

A typical comment from the Massachusetts sample was: "Services are minimal because there is neither funding nor staff to deal with student needs adequately."

In order to determine which variables were related to the number of services that centers provided, a seventeen point Likert scale was constructed using the variables in the Massachusetts sample and a seven point scale for the national sample. A number of different models were tested for both samples and the best are as follows.

National Sample

SERVICES = 0.22STAFF + 0.49TIME + 0.36TYPE

R SQUARE = 0.90 $P < 0.00005$

Massachusetts Sample

SERVICES = 0.21STAFF + 0.30TIME + 0.56TYPE

R SQUARE = 0.93 $P < 0.00005$

In both samples the more staff in the center and the more time devoted to the delivery of services by the center director the greater the number of services offered. In addition, four year colleges and universities tended to offer a larger number of services.

Funding

In terms of funding, most Massachusetts centers received some federal funding (71%) while most of the national sample did not (72%). Neither sample received much private funding such as corporate money, but in Massachusetts all responded that they received some type of funding other than governmental funding. The differences between the samples in terms of federal funding and other funding were statistically significant. About 60% of the Massachusetts centers received some type of vocational rehabilitation funding. This data is presented in the Appendix in Table Three.

The identified challenges relating to funding in Massachusetts include the requirement for a student to take six or more credits (which was not always possible due to the disability), shifts in the composition of the student population, fragmented planning, being on soft money, center staff having other duties (e.g., international students and veterans), and the college priorities not including disabled students. Recommended strategies to meet these challenges include a clearing house for information on and availability of resources, more advocacy by the Regents and the state Office on Disability, consortia among some institutions to share specialized staff and equipment, public awareness of the legal mandate to provide services, and seeking funds from the private sector.

A typical comment was: "The College has relied very heavily (too heavily) on grants in these matters. Institutionalization of services is a current priority."

Since the question of funding on the national level was "yes or no" and on the Massachusetts level whether the centers received one or more types of additional funding, regression models were not appropriate. However, on the national level using chi square a statistically significant result ($p = 0.01$) was found between having additional funding and being a community college with a moderately strong association (gamma = 0.85). Using a t-test a statistically significant result was found between having additional funding and having more hearing impaired students ($p = 0.03$), more disabled students in total ($p = 0.03$), and more staff members ($p = 0.01$). These results may indicate that nationally community colleges sought out more disabled students, especially hearing impaired students, required more staff, and thus obtained additional funds beyond what the state provides.

Using discriminant analysis, 77% of the cases of the variable measuring whether additional funding existed or not were correctly classified. The correlations with the discriminant function were: 0.82 for the size of the staff, 0.61 for the total number of disabled students on campus, 0.57 for the number of hearing impaired students on campus, and -0.40 for the variable type-of-institution indicating that community colleges were more likely to have additional funding. These results confirm those findings already presented.

In the Massachusetts sample some of the same results were found. Using a t-test a statistically significant result was found between having more than one additional source of funds and having more hearing impaired students ($p = 0.04$), more disabled students in total ($p = 0.05$), and having more mental/emotionally impaired students ($p = 0.02$). In neither sample was a statistically significant relationship found with the number of services offered by the center, but other variables were related to the number of services. This data is presented in the Appendix in Table Four.

Discriminant analysis on the Massachusetts sample confirmed these results, but an additional variable was required. Using the variable about whether or not additional funding was received by the center, 77% of the cases were correctly classified using the number of hearing impaired students on campus (correlation of 0.56), the number of mental/emotionally impaired students on campus (0.38), the total number of disabled students on campus (0.29), and the additional variable of whether the center's director was federally funded (0.96).

Accessibility

In terms of access, two thirds of both samples fell into a middle category of partly or limited campus accessibility. Only 25% of the Massachusetts campuses and 37% of the national campuses were reported to be fully accessible.

Although neither survey instrument identified access only in terms of mobility impaired students, it was probably assumed in the national sample. In the Massachusetts survey it was clearly assumed because the instrument went on to ask if campus changes had been made for persons with sensory disabilities and 58% responded affirmatively. The changes included flashing alarms

in the dormitories, a TDD and dedicated phone number, tape recording of catalog and school calendar, changes in elevator controls and signs, tactile maps, automatic door openers, and structural changes in bathrooms. A number of the respondents who answered "no" said these changes were needed. This data is presented in the Appendix in Table Five.

The major accessibility problems mentioned by the Massachusetts sample included lack of physical accessibility in bathrooms, recreation areas, and classrooms, lack of signage, lack of emergency evacuation equipment, snow and ice in the winter, hills all year round, assisting emotionally disabled students to cope with campus layout, lack of ramps and curb cuts, resistance to modifying "historical" buildings, offices with poorly arranged furniture, and administrators using cost as an excuse for lack of accessibility.

Frustration was expressed by several respondents over continual meetings with members of the college administration during which the need for accessibility was accepted, but no action nor funding was forthcoming. The strategies for coping with accessibility problems included more funding, long term planning, the education of administrators regarding the increasing number of disabled students, rescheduling classes and meetings to accessible areas, buildings connected by accessible enclosed walkways, Braille directories on each floor of a building, increased maintenance budgets, and leadership by the state Board of Regents.

Again in Massachusetts the question of accessibility was expressed in ordinal categories without a range so that a regression model was not appropriate. However, the two best and the two worst categories were collapsed and discriminant analysis was used. Using three variables, 77% of the cases were correctly classified. The number of mobility impaired students had the largest correlation with the discriminant function of 0.59. The more mobility impaired students, the better the campus was in terms of accessibility. The type of institution had the next largest correlation (0.44) meaning that four year colleges and universities tended to be more accessible than community colleges. The number of services offered had a very low correlation (0.05), but its inclusion increased the percent of cases correctly classified by twenty points. If the number of services offered was an indication of the strength of the center, it makes sense.

In the national survey instrument the categories were associated with percentages of the campus accessible. Using category midpoints an interval variable was constructed and several regression models were tested. The best one involved the variable measuring the number of services.

National Sample

ACCESS = 0.94SERVICES

R SQUARE = 0.89 $P < 0.00005$

In other words, the more services offered the better the campus accessibility. The causal arrow may go the other way, but the interpretation could be that the greater number of services offered,

the greater the need for accessibility because more disabled students with mobility impairments enrolled.

A number of Massachusetts respondents commented that because of funding restrictions, their campus was not as accessible as the legal mandates required. However, other campuses were described as accessible because they were newly built and because of cooperation between the Board of Regents, the state agency responsible for capital planning, the state Office on Disability, and local disability advocacy groups.

Advocacy

Advocacy was one of the most frequently suggested strategies for making changes found in the surveys and elsewhere. It was not surprising, then, that every institution in Massachusetts and all but one in the national sample reported that they carried out advocacy with faculty and staff members. In Massachusetts written information on rights and services were provided to disabled students by 92% of the respondents, information was provided to faculty and staff by 88% of them, and 96% of the sample indicated that there was a procedure for disabled students to register complaints. Of the Massachusetts sample, 79% agreed that faculty respond positively to the needs of disabled students, 83% agreed that faculty had the same expectations of disabled students as of other students, and 88% agree that faculty treated disabled students fairly. Only 58% agreed, however, that faculty had adequate information and support for accommodations. Problems still existed since 46% agreed that disabled students do suffer from discrimination by faculty.

In order to investigate faculty attitudes further and to determine if there were factors related to them, a twenty point Likert scale was created using the five possible responses on the four Massachusetts faculty attitude questions: faculty response to the needs of disabled students, faculty expectation of them, faculty treatment of them, and (after reverse coding) whether some disabled students suffered from faculty discrimination. The higher the score, the better the faculty attitudes on that campus. Several regression models were examined and the following one was determined to be the best one.

Massachusetts Sample

ATTITUDES = 0.52TOTAL + 0.47TIME

R SQUARE = 0.82 P = 0.0002

The attitudes of the faculty had a positive relationship with the number of disabled students on campus and the amount of time the center director devoted to providing services for them. The more the faculty encountered disabled students and the greater the amount of time spent on the job by the director (perhaps denoting the perceived importance of the job), the better the faculty attitudes toward disabled students. Another regression model which is more elegant, but may not have as much theoretical coherence, is this one.

Massachusetts Sample

ATTITUDES = 0.95SERVICES

R SQUARE = 0.90 P < 0.0005

Faculty attitudes were positively related to the number of services offered by the disabled student center. While the data fit is a little better, simply increasing the number of services will not cause faculty attitudes to increase. Instead, the number of services offered were functions of other variables such as the number of staff and the amount of time devoted to providing the services. The number of services also served as a surrogate for the number of disabled students on campus and the importance of the endeavor in terms of the director's time. But no matter which explanatory scheme was used, faculty attitudes were important.

Transition

One way in which the attitude of faculty toward disabled students played a crucial role was in the transition from high school to college although other factors were also important. For example, 50% of the Massachusetts sample reported that they actively conduct outreach to prospective students with disabilities and 88% said that their services were covered in the college bulletin which the students hopefully read.

The problems listed in the Massachusetts survey relating to transition included poor reading/writing skills by students with a profound hearing loss, general lack of preparation for college, unrealistic expectation of one-on-one attention from faculty, lack of preparation for living independently, refusal to identify as a disabled person until a crisis occurs, being a learning disabled student, a lack of self-esteem and/or motivation, a lack of decision making skills, a lack of realistic goals, an open admission policy, and the 504 mandates prohibiting discrimination. Several of the problems appeared to reflect frustration more than anything else.

Strategies recommended to meet these problems include a summer orientation for students, workshops for staff, more information provided to students about college life and the application process, peer counselors, better campus brochures, trained campus tour guides, better prepared resource people, more cooperation with high school counselors, encouraging reduced loads where necessary, unspecified changes in high school curriculum, the transition process begun much earlier in high school, ending open admissions, more funding, a separate transition program, and more outreach and awareness. A typical comment was: "Transition for the non-disabled student is difficult [and] those students with disabilities are confronted with major difficulties."

About two thirds of the Massachusetts respondents disagreed with statements in the survey that students with disabilities were adequately prepared academically for college, were adequately counselled about what courses to take to prepare for college, were adequately counselled about how to choose a college, that new students had enough awareness of their disabilities to articulate their needs clearly, and that they submitted adequate documentation when they identified as disabled in the admissions process. Only 48% disagreed that students with disabilities were adequately counselled about how to apply to college. These six statements were combined into a 30 point Likert scale reflecting the view of the respondents about the transition

process. Various regression models exploring the combined views of the transition process were examined and the best one was the following.

Massachusetts Sample

TRANSITION = 0.91ATTITUDES

R SQUARE = 0.83 P = 0.0001

In other words, 83% of the variation in the how the transition process was viewed was explained by how the respondent perceived faculty attitudes toward disabled students. The better the attitudes the better the transition process was viewed. The crucial role of the faculty in the transition process was certainly supported by this finding. Again, using the variable measuring the number of services, an alternative regression model was developed.

Massachusetts Sample

TRANSITION = 0.93SERVICES

R SQUARE = 0.87 P < 0.00005

This model can not be said to be more elegant, but it might make more theoretical sense to say that if more services are offered, there will be a better transition. It depends upon one's perspective. When both independent variables were forced into the equation, neither one was statistically significant.

Technology

Another thing which could aid in the transition and which could be necessary for the academic success of disabled students was adaptive technology. However, adaptive technology was not widely available in Massachusetts disabled student centers in 1988. The respondents reported that 50% did not have a TDD and 83% did not have an assistive listening device. An adapted computer with speech output would not be found in 54% of the centers, an adapted computer with Braille output would not be found in 88%, an adapted computer with large screen output would not be found in 54% of the centers, an adapted computer with software modifications would not be found in 42% of them, a Kurzweil Reading machine would not be found in 88% of the centers, and a closed circuit television would not be found in 79% of the sample. Every center reported having a cassette recorder, but 17% did not have the capacity to prepare large print materials and 38% of the centers reported a lack of capacity to train students to use adaptive technology. In many of the cases the respondents reported no request for the device, but lack of funding dominated the reasons given for not having the piece of technology.

When asked what technology was needed, many of the above items were mentioned. The problems associated with providing adapted technology included lack of funding, lack of staff knowledge and time, not enough students needing a specific piece of equipment to purchase it, cost, faculty attitudes, space, and lack of lead time to obtain the equipment.

The strategies recommended to meet these problems included need assessments, staff training, a clearing house for information on adaptive computing, more funding, sharing of equipment between institutions, state wide training workshops, and quantity discount prices. One typical comment was: "...both [computer] software and hardware are changing and improving so quickly that it is difficult to determine appropriate purchasing time." Another comment was: "Desperately needed."

In order to examine the role which adaptive technology played in the transition to college from high school, a ten point Likert scale was constructed on the basis of whether or not adaptive equipment was available. Several regression models were reviewed and the best one was:

Massachusetts Sample

TRANSITION = 0.89TECHNOLOGY

R SQUARE = 0.80 P = 0.0001

There was a strong association between the number of pieces of adaptive equipment available and the view of the ease of the transition. In order to investigate what produces more adaptive technology equipment, a number of regression models were run. The best of them is the following one.

Massachusetts Sample

TECHNOLOGY = 0.94SERVICES

R SQUARE = 0.88 P < 0.00005

Obviously, the more services offered, the more pieces of adaptive technology needed. There is not a perfect correlation because not every service needs a piece of adaptive equipment. Nevertheless, the important role of the variable measuring services was again demonstrated.

A Comparison of the Two Samples

A number of comparisons of Massachusetts with the national sample have already been made. However, using discriminant analysis it was possible to correctly classify 75% of the cases with only a few of the variables. These variables showed the broad differences between the public institutions in Massachusetts and the rest of the nation. These variables along with their correlation with the discriminant function were whether the center received any federal funds (0.54), whether the center offered sign language interpreters in the class room (-0.51), the amount of accessibility (-0.38), and whether the center offered personal care assistants (-0.22). A negative sign means that the variable was more characteristic of the national sample than of the Massachusetts sample. The larger the number the stronger the difference between the two samples.

Using a larger number of variables, 96% of the cases were correctly classified. These variables with their correlation with the discriminant function were whether the center received funds other that public funds (0.49), the amount of time spent by the director on providing services (-0.38), whether sign language interpreters were provided for the classroom (-0.37), whether federal funds were received by the center (0.31), the number of mobility impaired students (-0.22), the number of visually impaired students (-0.21), the number of hearing impaired students (-0.20), the total number of disabled students (-0.16), and the amount of accessibility (-0.15). Again a minus sign means that the variable was associated with the national sample and the magnitude of the correlation was a measure of the strength of the difference. Massachusetts centers differed from the national sample of centers in that more of Massachusetts centers received monies from non-public sources, the directors spent less time on the provision of services to disabled students and more on other duties, fewer provided sign language interpreters in the classroom, more received federal funding, had fewer mobility impaired, visually impaired, hearing impaired students, had fewer disabled students overall, and generally the campus was less accessible than the national sample of centers in public institutions.

Conclusion

A review of the findings of this study indicated that there was a clear interrelation (on both the national level and in Massachusetts) between the staffing of the center, the number of disabled students on campus, and the number of services offered by the center. These three variables explained or helped explain every other variable considered. Nationally the time the director spent running the center was a function of (or was associated with) the number of staff and the type of institution. In Massachusetts it was associated with the total number of disabled students. Nationally the total number of disabled students was a function of (or was associated with) the size of the staff and the amount of campus accessibility. In Massachusetts a bit of circularity occurred with the total number of disabled students being a function of the time spent by the director. Other factors were obviously at work, but were not tapped by the survey instrument. Nationally the size of the staff was associated with the number of hearing and mobility impaired students plus being able to obtain non-public funds. In Massachusetts it was simply a function of the number of hearing impaired and learning disabled students on campus.

With the analysis of the services offered by the center a new dimension was introduced. This single variable (number of services offered) explained more than ever the size of the staff and the number of disabled students. Nationally and in Massachusetts the number of services offered was a function of the size of the staff, the director's time, and the type of institution. Nationally the amount of accessibility was directly a function of the number of services offered while in Massachusetts the number of mobility impaired students and the type of institution along with the number of services explained the amount of access. Although nationally the faculty attitudes toward disabled students was associated with the number of students and the director's time, in Massachusetts it was clearly associated with the number of services. In Massachusetts (since the variables were not present in the national sample) the transition process was explained by the number of services and even though the amount of adaptive technology available was strongly related to the transition process, the technology was associated with the number of services offered.

The number of services offered was an indicator of the strength of the center and the institutional commitment to it. A strong center with institutional commitment played a vital role in the success of the individual disabled student especially in terms of accessibility, the transition from high school to college, and faculty attitudes. A strong center was an important part of the educational environment for disabled students on the post-secondary level.

Before concluding one comment needs to be made. In every part of the Massachusetts survey and in responses to a question in the national survey, the problem of funding was prominent. Again and again this problem was mentioned both directly and indirectly in terms of needing more of some type of resource. It was one of the themes running through any discussion of disabled student centers. Combining the two samples, 78% of the respondents saw center budgets remaining the same or decreasing even though costs were rising.

In response to the budget crisis in Massachusetts in the late 1980s and early 1990s over $30 million was cut from the annual state budget for higher education, "hundreds" of faculty and administrators (both full time and part time) were laid off, over 1000 course sections were canceled, and some 9000 otherwise admissible students were turned away. (Flint, 1989; Blumenstyk, 1989) A similar situation existed in other states.

In conclusion, this study presents a picture of the services to disabled students at the end of the 1980s in both a good and a bad light. There were a substantial number of services being provided to disabled students and in many cases being well provided. However, every college and university had not only a major problem, but most of them pointed to several major problems in terms of service delivery and/or lack of needed services. In view of the then funding crisis nationally and in many states (which has not disappeared), most respondents conveyed a feeling of quiet desperation.

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Appendix with the Tables

Table One

General Characteristics

National Mass. Stat.

Sample Sample Total Sig.*

Institution Type

Community College 14 (50%) 14 (50%) 28 (100%)

Four or More Years 42 (81%) 10 (19%) 52 (100%) 0.01

Number of Staff:

Mean (Std Dev)

Both 4.1 (4.5) 4.3 (4.1) 4.1 (4.4) ns

Community College 5.4 (5.0) 5.8 (4.8) 5.6 (4.8) ns

College/University 3.6 (4.3) 2.2 (1.6) 3.3 (3.9) ns

Gender of Center

Director

Woman 38 (68%) 13 (54%) 51 (64%)

Man 18 (32%) 11 (46%) 29 (36%)

Total 56 (100%) 24 (100%) ns

Director's Position

Full Time na 21 (88%) na

Part Time na 3 (12%) na

Total na 24 (100%) na

Percent Dir's Time

on DSS

LE 25% 4 (7%) 10 (42%) 14 (18%)

26-50% 8 (15%) 3 (12%) 11 (14%)

51-75% 2 (4%) 4 (17%) 6 (8%)

76-100% 39 (74%) 7 (29%) 46 (60%)

Total 53 (100%) 24 (100%) 0.0002

Additional Personnel:

Mean (Std Dev)

Total Number na 3.3 (4.1) na

Full Time na 1.8 (2.1) na

Part Time na 1.6 (2.9) na

Mean Percent Time na 45.6 (36.1) na

Number of Students:

Mean (Std Dev)

Hearing Impaired 19.7 (26.4) 5.9 (8.7) 15.7 (23.5) 0.001

Visually Impaired 17.4 (22.4) 5.7 (5.1) 14.0 (19.8) 0.001

Mobility Impaired 46.2 (49.9) 19.1 (22.3) 38.3 (45.3) 0.002

Learning Disabled 49.2 (42.4) 72.4 (111.1) 55.9 (69.6) ns

Mental/Emotional na 7.3 (9.4) na

Other 46.6 (74.5) 24.8 (36.3) 40.3 (66.3) ns

Total 182.3 (153.6) 123.7 (87.2) 164.7 (139.1) 0.04

* For frequencies and percentages, a chi square test between the national sample and the Massachusetts sample; for means and standard deviations, a two tailed t-test between the national sample and the Massachusetts sample; in both cases an alpha level of 0.05.

Table Two

Services Offered by Centers

National Mass. Stat.

Sample Sample Total Sig.*

Sign Language

Interpretation

Academic

No 7 (12%) 11 (46%) 18 (22%)

Yes 49 (88%) 13 (54%) 62 (78%)

Total 56 (100%) 24 (100%) 0.003

Social/Rec

No na 18 (75%) na

Yes na 6 (25%) na

Total na 24 (100%) na

Note Takers

No 12 (21%) 1 (4%) 13 (16%)

Yes 44 (79%) 23 (96%) 67 (84%)

Total 56 (100%) 24 (100%) ns

Personal Care

Assistants

No 41 (73%) 21 (88%) 62 (78%)

Yes 15 (27%) 3 (12%) 18 (22%)

Total 56 (100%) 24 (100%) ns

PCA Referrals

No na 12 (57%) na

Yes na 9 (43%) na

Total na 21 (100%) na

Adapted

Transportation

No 37 (66%) 15 (63%) 52 (65%)

Yes 19 (34%) 9 (37%) 28 (35%)

Total 56 (100%) 24 (100%) ns

Modified Exam

Administration

No 1 (2%) 1 (4%) 2 (2%)

Yes 55 (98%) 23 (96%) 78 (98%)

Total 56 (100%) 24 (100%) ns

Readers

No 5 (9%) 1 (4%) 6 (8%)

Yes 51 (91%) 22 (96%) 73 (92%)

Total 56 (100%) 23 (100%) ns

Advocacy with

Faculty, Staff

No 1 (2%) 0 (0%) 1 (1%)

Yes 55 (98%) 24 (100%) 79 (99%)

Total 56 (100%) 24 (100%) ns

Books on Tape

No na 5 (21%) na

Yes na 19 (89%) na

Total na 24 (100%) na

Large Print

Materials

No na 5 (21%) na

Yes na 19 (89%) na

Total na 24 (100%) na

Braille Materials

No na 12 (50%) na

Yes na 12 (50%) na

Total na 24 (100%) na

Scribes

No na 6 (25%) na

Yes na 18 (75%) na

Total na 24 (100%) na

Curriculum Modi-

fication

No na 2 (9%) na

Yes na 21 (91%) na

Total na 23 (100%) na

ASL Instruction

No na 18 (75%) na

Yes na 6 (25%) na

Total na 24 (100%) na

Information and

Referral

No na 1 (4%) na

Yes na 22 (96%) na

Total na 23 (100%) na

Pre-Admission

Advising

No na 0 (0%) na

Yes na 24 (100%) na

Total na 24 (100%) na

* Calculated with chi square, alpha level of 0.05.

Table Three

Funding Characteristics

National Mass. Stat.

Sample Sample Total Sig.*

Dir's Position

State Funded

No na 3 (12%) na

Yes na 21 (88%) na

Total na 24 (100%) na

Center Receives

Federal Funding

No 38 (72%) 7 (29%) 45 (58%)

Yes 15 (28%) 17 (71%) 32 (42%)

Total 53 (100%) 24 (100%) 0.001

Center Receives

Private Funding

No 48 (91%) 21 (88%) 69 (90%)

Yes 5 (9%) 3 (12) 8 (10%)

Total 53 (100%) 24 (100%) ns

Center Receives

Other Funding

No 33 (62%) 0 (0%) 33 (43%)

Yes 20 (38%) 24 (100%) 44 (57%)

Total 53 (100%) 24 (100%) <0.00005

* Using chi square and an alpha level of 0.05.

Table Four

Campus Accessibility

National Mass. Stat.

Sample Sample Total Sig.*

Fully 21 (37%) 6 (25%) 27 (34%)

Partly 30 (54%) 8 (33%) 38 (48%)

Limited 4 (7%) 8 (33%) 12 (15%)

Lacking 1 (2%) 2 (9%) 3 (3%)

Total 56 (100%) 24 (100%) 0.008

* Using chi square and an alpha level of 0.05.

Table Five

Campus Accessibility in

Massachusetts

Academic buildings

Valid Cum

Value Label Frequency Percent Percent Percent

fully accessible 6 25.0 26.1 26.1

partly accessible 5 20.8 21.7 47.8

limited access 11 45.8 47.8 95.7

serious problems 1 4.2 4.3 100.0

no answer 1 4.2 MISSING

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TOTAL 24 100.0 100.0

Administration buildings

Valid Cum

Value Label Frequency Percent Percent Percent

fully accessible 6 25.0 25.0 25.0

partly accessible 10 41.7 41.7 66.7

limited access 5 20.8 20.8 87.5

serious problems 2 8.3 8.3 95.8

inaccessible 1 4.2 4.2 100.0

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TOTAL 24 100.0 100.0

Student services

Valid Cum

Value Label Frequency Percent Percent Percent

fully accessible 13 54.2 54.2 54.2

partly accessible 6 25.0 25.0 79.2

limited access 5 20.8 20.8 100.0

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TOTAL 24 100.0 100.0

Dormitories

Valid Cum

Value Label Frequency Percent Percent Percent

fully accessible 3 12.5 13.0 13.0

partly accessible 5 20.8 21.7 34.8

limited access 2 8.3 8.7 43.5

serious problems 1 4.2 4.3 47.8

do not have 12 50.0 52.2 100.0

no answer 1 4.2 MISSING

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TOTAL 24 100.0 100.0

Recreation areas

Valid Cum

Value Label Frequency Percent Percent Percent

fully accessible 4 16.7 16.7 16.7

partly accessible 8 33.3 33.3 50.0

limited access 5 20.8 20.8 70.8

serious problems 6 25.0 25.0 95.8

do not have 1 4.2 4.2 100.0

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TOTAL 24 100.0 100.0

Travel between buildings

Valid Cum

Value Label Frequency Percent Percent Percent

fully accessible 3 12.5 12.5 12.5

partly accessible 16 66.7 66.7 79.2

limited access 1 4.2 4.2 83.3

inaccessible 1 4.2 4.2 87.5

do not have 3 12.5 12.5 100.0

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TOTAL 24 100.0 100.0

Changes made for sensory disabilities

Valid Cum

Value Label Frequency Percent Percent Percent

no 10 41.7 41.7 100.0

yes 14 58.4 58.4 29.2

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TOTAL 24 100.0 100.0