Data Analytics to Enhance Services for Higher Education Students with Disabilities

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By

Lesley S.J. Farmer and Alan M. Safer

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PREFACE

Many studies demonstrate the positive significant difference that support services and resources make on the success of adult learners with disabilities, especially if started at the start of their involvement and continued throughout the students' lifecycle. For those services to be effective, they should be comprehensive, coordinated, inclusive and of high quality. To that end, the services themselves—not just students—should be monitored regularly to ensure sustained quality and improvement. However, most personnel in these positions have little training in this area, so this book offers a practical guide for program assessment and improvement through data analytics, including a statistics primer.

The book's introduction sets forth the characteristics and challenges of adult learners with disabilities, and it provides an overview of services for them in post-secondary educational settings. Starting with the premise of improving services for adult learners with disabilities, the second chapter focuses on data analytics. Chapters three and four detail systematic project design and management with the goal of improved efficiency and client satisfaction. Chapters five and six provide a statistics primer and describe practical statistical tools. The last part of the book consists of thirty case studies that encompass various aspects of disability services management and relevant data analytical approaches, which helps disability services staff understand and utilize data analytics to identify and implement targeted interventions.

Especially as institutions and businesses are data-driven, disability service staff need to know how to demonstrate their value and practice continuous improvement through high-quality, impactful data analytics. This book offers practical, proven guidance with lots of examples to help disability support centers provide continuous optimal data-informed services and resources. All students deserve the best.

CHAPTER 1

INTRODUCTION

One in four adults in the United States has some kind of disability (CDC 2023), and the percentage is slowly growing. The most frequently reported disability among all adults is cognitive disability, and the second most frequent is mobility, both of which grow in frequency as people age. About half of adults with reported disabilities are between the ages of 22 and 64, and a little more than a third of them are employed. In contrast, about three-quarters of adults in that age range who do not report having a disability are employed. Adults with disabilities in that age range are likely to earn less, experience more food insecurity, weigh more, have more housing challenges, and experience more victimization than their peers who do not have a reported disability.

> The results of the analysis confirm that persons with disabilities are nearly always worse off than persons without disabilities: on average, the former are less likely to ever attend school, they are more likely to be out of school, they are less likely to complete primary or secondary education, they have fewer years of schooling, and they are less likely to possess basic literacy skills (UNESCO 2018, 3).

Adult Learning

Learning is lifelong. Each new role such as becoming a parent or getting a new job, or new situation such as dealing with a health issue or finding a place to live, requires learning skills or behaviors. The motivations of these adult learners are varied: to pursue delayed post-secondary educational plans, to finish a degree, to increase their earning potential, to update skills, to change careers, to become self-employed, or to improve their personal life. In the process, adult learners confront several challenges that they must address, which may arise from their own dispositions such as lack of confidence or social anxiety, from a specific situation such as lack of time or limited finances, and from institutional barriers such as access to education or lack of support. Furthermore, as adults age, they are less likely

to participate in education, largely because they lack support or have health issues.

In the United States between a third and a half of adults participate in some kind of educational experience, largely in job-related training. About half of adult participants learn informally via video, television and audio tapes, and it is likely that most of all types of learning have increasingly been experienced online. Adults who participate in formal education less include women, seniors, lower income, less educated, less skilled, unemployed, or immigrant. That gap is much less for informal educational participation, although adults with less prior education tend to read less and use computers less to learn (Merriam and Baumgartner 2020).

Adult education itself is a complex construct. At the most fundamental level, adult education encompasses any systematic adult self-educating activities for self-improvement. The learning environment may be a formal structured educational setting with an established curriculum, a non-formal setting such as the workplace or organization, or an informal setting arising from everyday life such as a cooking show. The term "adult education" encompasses several definitions. The narrowest scope of adult education deals with adult literacy and high school equivalent education, which are often offered through public adult schools. English as a second language and citizenship training serve as typical extensions of basic education. Another branch of adult education deals with career technical education and apprenticeship, usually focusing on specific industry sectors. Another branch of adult education addresses daily skills such as consumerism, fiscal management, parenting, and aging.

At the other end of the adult education spectrum is post-secondary formal education, which can range from one-year trade schools and two-year associate degrees to bachelor's degrees, post-graduate degrees, and certificates. Additionally, adults may take enrichment courses or update their skills at a variety of post-secondary institutions. Undergraduate students who are older than 24 are typically called non-traditional students, which accounts for 85% of American enrolled in post-secondary institutions, although the numbers fall off significant when examining full-time enrollment at four-year institutions (10%); 63% of students at two-year institutions attend part-time. These non-traditional students are likely to attend part-time, have dependents, and be financially independent (Ross-Gordon 2011). Furthermore, many adults return for advanced work after several years in the workplace; the average age for adults in post-graduate programs is 33 years old.

What factors then optimize adult learning? The theory of adult learning, andragogy (Knowles, Holton, and Swanson 2014), identified key assumptions about adult learners: developed self-concept, prior experience to build upon, internal motivation to learn, readiness to learn linked to developmental tasks, need to know the reason to learn, and need for immediate application of learning. Based on these assumptions educators of adults should design instruction that facilitates self-directed learning. Andragogical principles follow, which apply to all adults, including those with disabilities.

- Adults should participate in planning and assessing instruction.
- Learning activities should build on adults' experiences.
- Instruction should focus on problem-solving more than providing content matter.
- Instruction should have immediate relevance to adult learners such that it impacts their own lives.
- Instruction should include social interaction as well as cognitive elements.

Adult Learners Who Have Disabilities

Adults with disabilities are twice as likely as peers without reported disabilities to not have earned a high school diploma. Another third of adults with disabilities have graduated from high school or have an equivalent degree. This issue is particularly disheartening when those people have undiagnosed or unaddressed disabilities (Bergson-Shilcock 2019).

One of the main reasons for adult basic education is functional illiteracy. About forty million adults in the United States have low literacy competence (about 19% of the adult population), and of that population over a fifth have multiple disabilities. Almost two thirds of illiterate adults are employed, usually in low-paying jobs, with adults having disabilities being under-employed and underpaid. Public education can serve only about two million adults per year, which results in waiting lists for classes throughout the nation (World Education 2020). Of those served, only six percent self-report a learning disability, although adult basic educators estimate conservatively at least ten percent of their students have this disability. Without a formal documentation of a disability, programs have a difficult time getting appropriate, sufficient funding so that adults with disabilities can receive low-cost support (Ross-Gordon 2018).

On the other hand, more students with disabilities attend post-secondary institutions, with about a fifth of undergraduates reporting having a disability (National Center for Education Statistics 2019). Considering that adults have to self-disclose their disabilities in order to receive accommodations and other services, that percentage reflects the learning ambitions and achievements of these adults. About 40% of them have been diagnosed with mental illness or depression, and over a quarter are reported experiencing attention deficit disorder. Among those students who received special education services in high school, 59% enrolled in post-secondary institutions, as compared to 72% of students without reported disabilities. While the percentage of students graduating from two-year institutions does not differ significantly by presence of a disability, of those students with disabilities enrolled in four-year institutions, a third fewer graduated from four-year institutions if they had a reported disability.

These issues continue for other types of adult learning situations, such as workplace training and non-formal education provided by recreation centers, libraries, and other entities. For instance, employees who get workplace training increase their job satisfaction; this result holds especially true for workers with disabilities (Ross-Gordon 2018). Informal education provided by organizations or even the mass media, while potentially very useful, tends not to target adults with disabilities.

Seemingly, digital technology expands learning opportunities for adults with disabilities as it can ameliorate the space-time constraints of face-to-face instruction. Furthermore, assistive technology can offer alternative ways to access and engage with information and communicate. Nonetheless, adults with disabilities are less likely to own a digital device and tend to use less technology than adults without reported disabilities (Perrin and Atske 2021).

Regardless of the setting, adult learners with disabilities face many of the same challenges as other adult learners. Some challenges are internal, such as lack of self-confidence, self-esteem, or self-efficacy. Other challenges are external, such as faculty perception and knowledge, social interactions, and work demands. Still other challenges are institutional such as inconvenient scheduling and lack of access to resources. These challenges can be more common and have more impact on adult learners with disabilities than on their peers without disabilities because of their physical, mental or developmental differences. For instance, Tansey et al. (2018) reported that students with disabilities had higher symptoms of psychological distress and depression and experienced less social support. These students also tended

to be less engaged, which negatively impacted their study habits and academic success. At the same time, adults might not want to disclose their disability because it could negatively affect those universal factors, such as social connections.

It should be noted as well that accommodations for adult learning are not limited to accessible instructional materials and their delivery but also other conditions to make those learning opportunities possible, such as facilities modifications, transportation, technical support, health care, self-care, aides, psychological services, physical and occupational therapy, workplace skills, fiscal literacy, housing, communication tools, social guidance, recreation, legal advice, and self-advocacy.

Disability Rights Laws

Several federal and state laws have been enacted to ensure that adults with disabilities are not supposed to be discriminated against, and their educational, work and living settings are supported to provide accommodations so they can have opportunities to accomplish their goals (U.S. Department of Justice 2020). While some laws in the 19th century made efforts to include individuals with disabilities, such as transportation, it was not until the late 20th century that a concerted effort was made to address the rights of persons with disabilities, who had been significantly discriminated against. The Architectural Barriers Act of 1968 requires federally funded facilities to be accessible to the public, including persons with disabilities. The Voting Accessibility for the Elderly and Handicapped Act of 1984 requires that polling places be accessible for federal elections, or that accommodations be made to ensure that these populations could vote.

1988 was a banner year for disability rights laws. The 1988 amendment of the Fair Housing Act prohibits house discrimination on the basis of disability, along with several other demographics; the act covers both private and government housing, including issues of zoning, construction, advertising, and finances. Passed the same year, the Air Carrier Access Act prohibits airlines from refusing to serve individuals with disabilities or to charge them more for airfare than people without reported disabilities. The Rehabilitation Act, linked to the Civil Rights Restoration Act, provides discrimination of any federal funded program or service; Section 504 requires federally funded post-secondary institutions to provide reasonable accommodations for learners with disabilities, and Section 508 specifically requires federally funded electronic and information technology to be accessible to people with disabilities.

In 1990 the first comprehensive federal law that addressed civil rights of persons with disabilities, focusing on employment discrimination and access to services, was enacted. Titled the Americans with Disabilities Act, this legislation sought four goals for persons with disabilities: equal employment opportunity, full participation in the community, economic self-sufficiency, and independent living. The Telecommunications Act of 1996, an amendment of the Communications Act of 1934, requires that telecommunications equipment and services must be accessible and usable by persons with disabilities (if readily achievable). Since then, other laws have been amended to address loopholes that affect individuals with disabilities, and other legislation at the state and local levels have been enacted to address the needs of persons with disabilities. In addition, Dear Colleague letters issued by the U.S. Department of Education, Office of Civil Rights, and/or the U.S. Department of Justice reinforce the obligation of providing reasonable accommodations. Nevertheless, these populations still encounter discrimination and have to self-advocate to receive services and accommodations as protected by law.

Currently, the two main federal systems that address foundational skills gaps of adults are the adult education system and the vocational rehabilitation system, which are funded by the Workforce Innovation and Opportunity Act, which supports adult basic education, high school equivalency, and English language instruction. Title IV funds support pre- and post-employment services for adults with disabilities, which can include educational opportunities. However, these two systems are not well coordinated. These programs, worthy as they are, do not address more advanced subject matter, exemplified by the Integrated Education and Training program, which helps adults build specific occupational skills. The fact that by 2027 seventy percent of jobs will require education of some sort beyond high school (U.S. Department of Education 2023) makes the prospect for adults with disabilities seem even more dismal.

Disability Support Services

The extent and quality of support services significantly impacts the success of adult learners with disabilities, both positively and negatively. In 2013 the U.S. spent over sixty billion dollars to support people with disabilities and employed 1.8 million dollars in services to persons with disabilities and the elderly. At the same time, those service workers earn an annual mean wage of less than $30,000. The fiscal implications are even more dire in that adults with disabilities have more difficulty accessing care, have higher

emergency department use, and higher hospitalization rates; their annual heath care costs average five times the cost compared with peers in the general population (Hostetter and Klein 2018). In addition, coverage is uneven, with rural areas receiving fewer services.

One of the issues about support services is their complex specialization and lack of coordination. Ideally, each adult learner should have an individual program plan co-created by the learner and the service center.

- Academics is just the start. Variables include course of study, scheduling, accommodations to fit the type of course (e.g., science lab, art studio, large lecture), possible assistive technology, aides, tutors, study skills training, assessment.
- Day services might include self-care, socialization training, community integration training.
- Home services might include residential services, housing support, personal assistance, parenting support, mobility training, homemaker services, and in-home respite help.
- Employment services might include workplace skills training, interviewing and application training, volunteer and internship support, fiscal management, transportation support (including work to school).
- Behavioral and health services might include behavior management, adaptive skills training, rehabilitation and physical therapy, medical and other health care, crisis intervention help.

A significant aspect of this endeavor is the connection and possible coordination between academic institutions and external disability service providers since issues such as childcare and transportation can impact participation in educational opportunities.

In most educational settings, the core disability service center focuses on academic support, and refers learners to other relevant service centers, if known. At large institutions, some of those centers may be on site, such as career placement centers, crisis counseling centers, health centers, and social clubs. Several studies emphasized the need for institutional integrated, comprehensive services that are both inclusive as well as provide overall disability and disability-specific support. Furthermore, such support services were most effective when they connected with outside agencies (Kilpatrick et al. 2017). All too often, support staff might not know of community-based services, and those services are generally not systematically coordinated let alone centrally managed.

Looking specifically at post-secondary educational institutions, the most common instructional accommodations include tutoring, recordings, notetaking resources, preferential seating, and testing variances (Weis, Dean, and Osborne 2016). Hudson (2018) discovered that students who disclosed their disabilities within the first year of enrollment had higher graduation rates than students who self-disclosed later to the extent that for every year that a student delayed disclosing a disability, the length of time to graduate increased by almost half a year. In contrast, students cited several reasons that they did not use support services for students with disabilities: lack of awareness of service options, lack of knowledge as to the physical location of the services, felt stigma if self-disclosing their disability (Jorgensen et al., 2018). In addition, the onset of several mental health disabilities occurs in young adulthood, which might be unidentified or denied by the individual (Pedrelli et al. 2015). Kilpatrick et al.'s 2017 study also mentioned the mismatch of needed and received disability support services, as well as staff training gaps and a one-size-fits-all approach, which frustrated adult learners.

Other large organizations often have a disabilities service center or at least a point person to deliver such services. Beyond the specific settings, thousands of disability service centers exist: governmental, not-for-profit, and commercial. In many cases, adult learners with disabilities are just one segment of the clientele population, such as a workplace childcare center or school transportation, and the staff might not have training on how to take care of adults with disabilities. Even in school health centers, where more disabilities are likely to be experienced by the residents, the staff are not likely to know how to deal with the wide variety of cognitive, physical and mental disabilities (Hostetter and Klein 2018).

On the bright side, effective programs that serve adult learners with disabilities share several characteristics (Hostetter and Klein 2018). They identify and address these adults' needs and risks, including counseling for emotional stress. They develop trusting relationships with these adults by co-planning care and providing opportunities for socialization with staff and peers. They integrate medical care and long-term support services to promote adult independent living

Need to Improve Disability Support Services

In sum, many studies demonstrated the positive significant difference that support services and resources have on the success of adult learners with disabilities, especially if started at the start of their involvement and continued

throughout the students' lifecycle. Because so many adults do not know about these services or how to access them, support services need to proactively reach out to the entire community to publicize their services (Kilpatrick et al. 2017). It should be noted that, while providing support services is a necessary condition, it is not sufficient; those services should be comprehensive, coordinated, inclusive and of high quality (Cox et al. 2017; Howe 2013). Furthermore, the services themselves should be monitored regularly to ensure sustained quality and improvement (Kilpatrick et al. 2017). For instance, while federally funded disability programs such as workplace readiness require oversight and regular reports, they do not guarantee program improvement, and other disability services have even less incentive for systematic efforts for self-improvement and are infrequently reported in the research literature. These efforts also require administrative support through allocation of human and material resources, funding, and supportive policies and practices (UNESCO 2018).

Especially during these economic times, disability services must optimize their operations to provide the most cost-effective services. At the same time, they should respond to community needs to optimize clientele use and satisfaction. Increasingly, data-driven decision-making is expected of disabilities services management, which may be daunting. Data analytics provides a tested way to assure continuous service improvement. The rest of the book provides guidance in identifying areas for improvement, determining which data to collect and how to collect it, analyzing the data, and acting upon the data to improve service efficiency and effectiveness as well as increase adult learner satisfaction.

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CHAPTER 2

IMPROVING SERVICES FOR ADULT LEARNERS WITH DISABILITIES

As noted in the first chapter, a quarter of adults in the U.S. lives with a disability. Therefore, services to these populations are vital–as well as a legal requirement. Especially in today's society, adults need to keep learning throughout their lives. Not only do work demands change over time, but day-to-day practices such as banking and communication change as well. Advances in technology have driven many of these changes, and advances in assistive technology have helped individuals with disabilities to address those changes. Therefore, disability support services must respond to those changes. In that respect, disability support services must learn and adapt alongside their clientele.

As also mentioned, supporting the learning of adults with disabilities entails more than curriculum and instruction but also supporting the organizational conditions for learning: infrastructure, resources, and faculty support. Even when disability support services do not provide the educational experiences themselves, they should help lower the barriers for those experiences: transportation, family care, financial management, and so forth. As with learning itself, the conditions for supporting learning also change, so disabilities services again need to keep current as they strive for continuous improvement.

These services are accountable to several stakeholders: the adult learners most of all, education providers, governmental entities that have oversight–or are impacted by disability support services, and the community at large because these adult learners themselves impact and are accountable to their communities.

Education Realities of Adults with Disabilities

Education has been shown to be economically and socially beneficial for adults in general, including those with disabilities. Especially with the

changing nature of academia and work, largely due to technological advances, adults with disabilities have more possibilities for both education and employment. However, the University of New Hampshire's 2020 report on disabilities statistics noted that 16.7 percent of young adults with disabilities have not earned a high school diploma compared with 7.7 percent of youth without reported disabilities. 15.6 percent of adults with disabilities earned at least a bachelor's degree computer to 38.4 percent of adults without reported disabilities.

The majority of education for adults is job-related, although education for social and personal development also interests adults. Likewise, formal educational settings are the most well-known avenues for learning, although non-formal and informal learning occurs in many venues: on-the-job, in recreation and cultural centers, in religious and public agency centers, and in private enterprise. Historically, adults with disabilities were associated with adult basic education, focusing on learning disabilities (Ross-Gordon 2018). Since most college students with disabilities tended to be over 24 years old, financially independent and veterans, they were often classed with other non-traditional students. Only within the last fifty years have post-secondary institutions hired specialists to address the needs of adult learners with disabilities. Similarly, the social model of disability, which asserts that disadvantages emerge through persons' interactions with specific environments such that educational institutions need to address those barriers. In that respect, adult education has come to recognize disability culture and power issues associated with learning in a culture of ableism. Adult educators increasingly see the importance of equitable access and inclusive instruction for self-development.

Even when educational opportunities are made available to adults with disabilities, not all eligible adults participate (Perrin and Atske 2021). Women, older adults, low-educated, low-incomed, in low-skilled jobs, unemployed and immigrants are less likely to participate in adult education than their counterparts. Factors impacting participation may derive from internal or external factors. For instance, individual psychological factors–self-concept, capabilities, values, prior educational experiences–may all be impacted by a disability. Motivation plays an important role: to accomplish an objective such as getting a job or to enjoy an activity for social contact. External factors and structural conditions also impact educational participation by adults with disabilities. For instance, some adults have constraints in acting independently. Educational venues might be hard to get to, or their facilities might not be physically accessible.

Adults with disabilities often have less income, which can limit their participation in costly educational experiences; worse, they may be in low-paying jobs in which their employers are not willing to support their educational goals. Interactions between the individual and social forces also impact educational participation, such as a mismatch of expectations, readiness for the experience, and degree of comfort with the instructor and other learners. Especially where few other adults with disabilities are engaging in the educational experience, some awkwardness can occur.

Focusing on the technology aspects, many post-secondary and other adult education institutions do not keep current with assistive and adaptive technologies or know how to use them effectively. While programs such as the University of Washington's DO-IT program provide guidance in making education accessible, not all educators know about such offerings. Disability services need to make the entire educational community aware of these technologies and their incorporation, and they need to help adults with disabilities advocate for such tools and help them use them effectively (DuBois, 1998).

In recognizing the potential economic contributions of adults with disabilities, the National Skills Coalition urged collaboration among adult education, workforce development and vocational rehabilitation centers to provide programs more effectively for these adults (Bergson-Shilcock 2019). Better alignment and coordination can lead to more efficient use of public funds due to streamlining referral processes and reducing duplicative work, more efficient staff development and cross-training, and standardized data standards and shared data systems.

Standards and Benchmarks

Providing disability services is a legal responsibility as well as the right thing to do. In the same way, disability service providers are accountable to their clientele, their governing agency, the government, and the general population. Over time, expectations have been established, and effective practices have been identified, which have led to recognized standards.

Standards provide disability services with defined expectations by which to measure service quality. Standards are typically derived from legislated mandates or from professional organizations. Benchmarks provide critical points at which to measure quality and can be used to compare service quality with other disability service centers.

Legislation

Starting with the U.S. federal government, of its ten disability rights laws, the one titled the Individuals with Disabilities Education Act (based on a 1975 education act) deals specifically with children. Nevertheless, several federal acts do mention education that impacts adults with disabilities. The 1990 Americans with Disabilities Act prohibits discrimination based on disabilities. For instance, employers with over fourteen employees and all government entities must provide all their workers with equal training opportunities. The 2008 High Education Opportunity Act authorizes comprehensive post-secondary programs for students with intellectual and disabilities and can provide federal financial aid for eligible students. The 1973 Rehabilitation Act Section 504 states that "no qualified individual with a disability in the United States shall be excluded from, denied the benefits of, or be subjected to discrimination under" any program or activity that either receives Federal financial assistance or is conducted by any Executive agency." This act impacts most public education institutions and many non-formal educational entities such as libraries. Another section, 508, of the Rehabilitation Act, requires that electronic and information technology be accessible to people with disabilities, including the public, which then impacts many educational endeavors. Indirectly, the 1968 Architectural Barriers Act affects education of adults with education in that federally funded buildings and facilities need to meet federal standards for physical accessibility.

Within the federal Department of Education, several offices address the needs and rights of adult learners with disabilities: the Office of Civil Rights to ensure equal access to education, the Office of Postsecondary Education to increase access to quality post-secondary education, the Office of Vocational Rehabilitation to provide and facilitate services to promote skills development, the Rehabilitation Services Administration to provide job training, and the Office of Vocational and Adult Education for Career and Technical Education to provide occupational training.

State governments also have laws that establish disability services for adult learners. For example, California's 1969 Lanterman Developmental Disabilities Services Act states that people with people with disabilities have a right to get services and support to live the most independent and product life possible, including the right to participate in an appropriate program of public education. Furthermore, those services should be provided in the last restrictive environment close to the home community. In terms of infrastructure, the act established regional centers to help

individuals with developmental disabilities to get the help they need in terms of information, finding the services needed, and providing life skills training.

Professional Organizations

As part of their strategic plan, the Association on Higher Education and Disability (AHEAD) acts to enhance higher education professionals' effectiveness. As such, two of their goals support this vision (2023, 1):

- "Be the premier provider of professional development to those committed to equity for disabled people in postsecondary education."
- "Serve as the hub of research excellence and knowledge translation regarding disability in postsecondary education."

To actualize this vision, AHEAD has developed several standards. Their 2021 professional standards address:

- Administration: developing, budgeting, communicating and evaluating program goals, services, policies, procedures; supervising and evaluation staff; addressing legal communications; and keeping current on disability service issues
- Direct service: determining program eligibility for services; communicating with–and keeping records of–students or parents about legalities, student development, eligible needs and accommodations; advocating for students; communicating with faculty, institutional administrators and other campus departments about students' needs; arranging accommodations for students
- Consultation/collaboration: consulting with resources at the campus, local, and state levels; collaborating with the campus on facilities accommodations; communicating with the campus community and feeder schools; keeping current about adaptive technology
- Institutional awareness: serving on campus committees that impact disability service; providing training to campus personnel about disability service and issues
- Professional development: keeping current professionally through professional development events, reading professional literature, and joining professional organizations.

AHEAD's 2021 program domains, standards and performance indicators address: