

Instruction in Areas of the Expanded Core Curriculum Linked to Transition Outcomes for Students with Visual Impairments

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Abstract: A secondary analysis of pertinent measures from the National Longitudinal Transition Study 2 found numerous significant relationships between instruction in the content areas of the expanded core curriculum and positive outcomes for students.

The provision of services to youths with visual impairments who are in transition from school to work and adult life is not a new concept. Projects have focused on this population for many years within the rehabilitation and education communities. Beginning in the mid-1970s, the U.S. federal government passed numerous pieces of legislation that demonstrated its commitment to the career development of people with disabilities and mandated their inclusion in meaningful educational and rehabilitation experiences (see, for example, P.L. 93-112, the Rehabilitation Act of 1973; P.L. 94-142, the Education for All Handicapped Children Act of 1975; P.L. 94-482, the Vocational Education Act Amendments of 1976; and P.L. 95-207, the Career Education Incentive Act of 1977). Both the Rehabilitation Act

and the Education for All Handicapped Children Act, which became the Individuals with Disabilities Education Act and, more recently, the Individuals with Disabilities Education Improvement Act, have been consistently improved over time through the reauthorization process to support the inclusion of people with disabilities in the community (Rubin & Roessler, 2008; Wilson, 1998).

The Americans with Disabilities Act of 1990 (P.L. 101-336) extended protections under the provisions of the Rehabilitation Act to all people with disabilities, guaranteeing access to public buildings, programs, transportation, telecommunications, and employment. Despite these legislative efforts, however, positive transition outcomes for youths who are blind or have low vision have remained elusive (Capella-McDonnall, 2010; Shaw, Gold, & Wolffe, 2007; Wagner, Newman, Cameto, & Levine, 2005). To gain a better understanding of the factors that are inhibiting their pursuit of employment, independent living, and other positive transition outcomes as these youths move from school to work



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and adult responsibilities, we investigated which disability-specific services these young people receive through the public school system and how those services translate into outcomes for the youths who receive them.

Educational experts in the field of visual impairment long contended that content areas outside the general education curriculum are critical for students who are blind or have low vision to master to succeed in school, obtain employment, and fully participate in society (Alonso, 1987; Curry & Hatlen, 1988; Hazecamp & Huebner, 1989). These disability-specific content areas, which came to be referred to as the expanded core curriculum (ECC), include compensatory, orientation and mobility (O&M), assistive technology, independent living, social interaction, recreational and leisure, sensory efficiency, career education, and self-determination skills (Hatlen, 1996; Huebner, Merk-Adam, Stryker, & Wolffe, 2004). Although there was general agreement that these areas are important, teachers and advocates continued to debate how to accomplish the task, given the time constraints of the school day and who was responsible for teaching which elements of the ECC (Lohmeier, 2007; Lohmeier, Blankenship, & Hatlen, 2009; Wolffe, Hatlen, & Blankenship, 2010; Wolffe et al., 2002). We were interested in exploring whether there was empirical evidence to support the importance of providing instruction in areas of the ECC by virtue of enhanced outcomes for the students who received such disability-specific instruction.

The study reported here involved a secondary analysis of pertinent measures related to the ECC that were taken from an existing federal database, the National Longitudinal Transition Study 2 (NLTS2).

Although not all areas of the ECC were addressed in the NLTS2 data, relevant items were included, such as instruction received in braille, O&M, assistive technology, and career counseling (albeit not career education per se, students and parents were asked if the youths had received help in finding a job, training in job skills, or vocational education). In addition, some items that were included in the NLTS2 surveys gave evidence of social engagement by transition-aged students. We closely examined the relevant items in an effort to analyze whether such ECC-like activity positively influenced the likelihood of success (that is, such outcomes as employment, participation in volunteer activity, or movement into postsecondary education and training) for students with visual impairments. The following research questions were assessed in relation to youths with visual impairments:

1. What percentage of these youths were participating in ECC-related activities during their early high school years?
2. Were there significant relationships between compensatory skills, such as the use of braille and other areas of the ECC (that is, O&M, assistive technology, and career education) during the early high school years?
3. Was there a significant relationship between these youths having paid jobs and having received career counseling (that is, help in finding a job, training in job skills, or vocational education) during each of the four waves of data collection?
4. Was there a significant relationship between these youths having participated in volunteer or community service in the past 12 months and having received

career counseling during each of the four waves of data collection?

5. Was there a significant relationship between these youths having been engaged in either employment or postsecondary training (including job training) in the two years since high school and having received O&M services (assessing data from Waves 3 and 4)? This was a clustered variable provided by the NLTS2 database in Waves 3 and 4 that addressed engagement in employment or postsecondary school or both in the previous two years or training in specific job skills since high school or both.
6. Were there significant relationships between the use of computers by these youths and having been invited to participate in social activities with friends (assessing data from Waves 3 and 4)?
7. Were there significant relationships between the postsecondary outcomes for students who are totally blind and their receipt of ECC-type services (assessing data from Wave 4)?

Methods

DATA SOURCE

The NLTS2 is a nationally representative, longitudinal database of high school and post-high school transition-aged youths with disabilities. The data were collected on five occasions (five waves) between 2000 and 2009. We analyzed data from the first four waves for this study: Wave 1: 2000–01 (when the youths were aged 13–16); Wave 2: 2002–03; Wave 3: 2004–05; and Wave 4: 2006–07. Although the fifth wave of data collection occurred in 2009, the data sets were not available in time to be included in our

analyses. The tools used in the data collection process included interviews with parents or guardians and with the youths; surveys of teachers, school programs, and school characteristics; students' assessment histories; and transcripts detailing which courses the students had taken, the grades the students received, and the students' attendance records.

According to Valdes et al. (2006), the NLTS2 sample was created in two stages using the most reliable and valid methods possible for implementing this large-scale nationwide survey. The stratified sample of 3,634 local education agencies (LEAs) was randomly selected from an estimated 12,000 LEAs that serve students in the 7th through 12th grades who received special education services. The LEAs and 77 state-supported special schools (schools that serve primarily students with visual or hearing impairments and multiple disabilities) participated in the NLTS2 study. In the final survey year of the NLTS2, the samples included enough students in each disability category to generalize to each disability category individually. This level of rigorous precision also accounted for response rates to the surveys and attrition of the sample throughout the duration of the NLTS2.

DATA ANALYSIS

Descriptive data were generated to provide demographic information and the results for the first research question. Overall, the descriptive data pertaining specifically to measures of the ECC fell into two categories: youths with low vision and youths who are completely blind.

To test the significance of relationships between ECC-like areas of interest and meaningful outcomes, we conducted additional analyses that used weighted data

to provide national estimates. All measures that were included in the relational data analysis had two response options per measure. Yates's correction for continuity (Yates, 1984) and an alpha level of .05 were used to determine the significance of the relationships between each assessed area of the ECC using binary measures. For the two-by-two tables detailing relationships assessed in our study, the correct *p*-value provided by Yates's correction for continuity is more precise than the *p*-value provided by the uncorrected and traditional chi-square test (Yates, 1984). In addition to the *p*-value, the phi coefficient was used to document the resulting associated effect size.

Results

DEMOGRAPHIC DATA

In the NLTS2 study, only transition-aged youths were included in the data collection and subsequent analyses. The demographic data reported here were weighted and based on the parents' interviews in Wave 1. The number of youths who were diagnosed with visual impairments in the United States was estimated to be 40,610 (1.9% of the youths with disabilities). The number of youths with visual impairment as their primary disability (including low vision and blindness) was estimated to be 10,840 (.5% of the youths). **In this article, only the latter (youths with visual impairment as their primary disability) were assessed.** Table 1 presents the characteristics of the youths with visual impairments who were included in the Wave 1 NLTS2 data.

Furthermore, the vast majority of the youths (89.7%) were from families in which English was spoken in the home, 7.6% were from Spanish-speaking house-

Table 1
Characteristics of the youths with visual impairments who were included in Wave 1 of NLTS2.

Characteristic	Percentage
Age at time of the survey (in years)	
13	7.5
14	21.1
15	21.8
16	26.8
17	22.8
Ethnicity	
White	62.6
Black	19.8
Hispanic	13.8
Other	3.8
Gender	
Male	12.8
Female	87.2
Household annual income (\$)	
0–24,999	31.0
25,000–49,999	34.0
50,000 or more	36.0

Note: Due to rounding, the total for income is over 100%.

holds, and the remainder were from families in which another language was spoken in the home. Just over half these youths (55%) lived with two parents, 21% lived with one parent, and just over 5% lived with other relatives.

All sample sizes were rounded to the nearest 10 in accordance with the Institute for Educational Sciences' (IES) publication policy for restricted-use data. Since we assessed restricted-use data, we presented the study to the IES Data Security Office for a disclosure review. No potential disclosures were found, and IES approved the release of the resulting data that are included in this article.

DESCRIPTIVE DATA PERTAINING TO THE ECC

The first results presented were those analyzed descriptively to assess the first

research question using data from Wave 1 of the NLTS2. The results showed that youths with visual impairments were receiving services or materials related to ECC instruction to a limited extent in some instances, for example, career counseling, which was defined as help in finding a job, training in job skills, and vocational education. In addition, the severity of visual impairment (low vision or total blindness) was a contributing factor in differences with some of the ECC-related measures, such as those related to the use of assistive technology.

Youths with low vision

Of the youths with a primary disability of low vision, 49% received O&M services; 57% received assistive technology services or devices; and 57% used assistive technology, such as voice synthesizers or software to enlarge the size of print on the computer screen. In addition, 29% of these youths received career counseling (that is, help in finding a job, training in job skills, or vocational education).

Youths who are totally blind

Of the youths with a primary disability of total blindness, 53% received O&M services; 70% received assistive technology services or devices; and only 39% used assistive technology, such as voice synthesizers or screen-enlargement software. Finally, 24% of these youths reported receiving career counseling.

RELATIONAL DATA ANALYSES

The following results are organized according to the content area or areas of the ECC to which they most pertain. The results are provided for research questions 2–7 in the following sections.

Compensatory or access skills

Research question 2 assessed Wave 1 data pertaining to the experiences of youths with visual impairments in the area of compensatory or access skills by looking at the youths' use of braille during the early high school years. The students used their braille reading and writing skills to access the mainstream or core curriculum. We were interested in seeing whether their use of braille was significantly related to other ECC-like areas.

There was a significant relationship between youths who are blind or with low vision receiving O&M services and youths using braille ($p = .00$, $\phi = .48$). A significant relationship between youths with low vision receiving assistive technology services and youths using braille as of Wave 1 was also evident ($p = .00$, $\phi = .36$), as was a significant relationship between youths with low vision using portable braille notetakers and youths using braille ($p = .00$, $\phi = .81$). The relationship between youths with low vision using assistive technology to see or read and youths using braille was also significant ($p = .00$, $\phi = .37$). Finally, there was a significant relationship between youths with low vision receiving career counseling services and youths using braille ($p = .00$, $\phi = .20$).

Career counseling and employment or volunteer or community services

The results for research questions 3 and 4, which explored the relationships between career counseling and such outcomes as engagement in employment or involvement in volunteer or community service, are presented in Table 2 for each of the four waves of data collection. For

Table 2
Career education relationships organized
by research question.

Research question	Wave	<i>p</i>	φ
3	1	.02*	.08
3	2	.04*	.11
3	3	.93	-.02
3	4	.00*	.33
4	1	.00*	.11
4	2	.00*	.02
4	3	.00*	.46
4	4	.00*	-.38

* $p < .05$. $\varphi = \varphi$ coefficient.

research question 3, there was a significant relationship between youths who were blind or with low vision having a paid job and having received career counseling for Waves 1, 2, and 4. We did not investigate whether the youths were working full time or part time—simply whether they had paid jobs in the past two years. Similarly, the results for research question 4 indicated a significant relationship between youths who were blind or had low vision who had participated in volunteer or community service in the past 12 months and had received career counseling services across all four waves of data collection.

Research question 5, which concerned O&M training and its relationship to outcomes in employment or postsecondary training (the youth attended a postsecondary school to earn a high school degree or attended a two-year community college, a postsecondary vocational school, or a four-year college or university or both) assessed the clustered variable provided by the NLTS2 database. The NLTS2-created variable was derived from a composite of three answer choices: the youth had a paid job in the past two years, the youth attended any type of postsecondary

school in the past two years, or the youth had training in specific job skills since high school. This analysis showed that there was a significant relationship during Wave 3 ($p = .00$, $\varphi = -.32$) between youths who were blind or had low vision having been engaged in employment or postsecondary training in the past two years (including job training) since high school and having received O&M services. However, this relationship was also assessed for Wave 4 and was found not to be significant ($p = .25$, $\varphi = .53$). In this instance, Wave 1 and Wave 2 data were not assessed because the outcome of employment or postsecondary training was not yet a feasible outcome for the majority of the sample who were still in high school.

Social skills

Research question 6 assessed the significance of relationships between the use of computers by youths with low vision and their likelihood of having been invited to social activities with friends during Waves 3 and 4 of the NLTS2. We found a significant relationship between these youths knowing how to use a computer for homework and school assignments and being invited to social activities with friends in the past 12 months (Wave 3: $p = .00$, $\varphi = .45$, and Wave 4: $p = .00$, $\varphi = .51$). There was also a significant relationship between youths with low vision knowing how to use a computer to access the Internet and being invited to social activities with friends in the past 12 months (Wave 3: $p = .40$, $\varphi = .45$, and Wave 4: $p = .00$, $\varphi = .64$). Another significant relationship was demonstrated between these youths knowing how to use a computer for e-mail or instant messaging

and being invited to social activities with friends in the past 12 months (Wave 3: $p = .00$, $\varphi = .26$, and Wave 4: $p = .00$, $\varphi = .59$). The relationship between these youth knowing how to use a computer to participate in chat rooms and being invited to social activities with friends in the past 12 months was significant as well (Wave 3: $p = .00$, $\varphi = .35$, and Wave 4: $p = .00$, $\varphi = .44$).

Outcomes for students who were totally blind

Research question 7 assessed the relationships between post-high school outcomes for youths who were totally blind and their receipt of ECC-type services. We found significant relationships between these youths using assistive technology such as braille notetakers and computers to access the Internet or send e-mail in Wave 3, and attending a post-secondary institution after leaving high school (reported in Wave 4) or having a paid job ($p = .00$). Likewise, there were significant relationships between these youths' receipt of instruction in braille and O&M and having a paid job other than work around the house (if out of high school a year or more) as reported in Wave 4 ($p = .00$). In each instance assessed by research question 7, the phi coefficient was higher than .30, demonstrating strong relationships.

LIMITATIONS

The methods were limited to a secondary analysis of a federal database, the NLTS2. Although we found many ways to measure the ECC within data provided by the survey instrument, this database already existed and contained content that was not a specific assessment of each content

area of the ECC. The data were self-reported by the parents and youths. There are other sources of valid and reliable data that would be worthy of the same sorts of assessments (for instance, data reported by teachers of students with visual impairments), but these sources were not available in the NLTS2 database or aligned with the analyses implemented in our study.

Another limitation of the study was that we did not structure the questions asked of the parents and youths in the NLTS2 surveys. For example, the youths were asked, "During the past 12 months, have you been invited to other kids' social activities, like over to their home or to a party?" and only yes-or-no response options were provided. The youths were not asked about their level of engagement at such activities. In a similar vein, while the NLTS2 surveys asked about the jobs that the youths had (full time, part time, hours worked, salary received, type of work, and so forth), in our analyses, we chose an NLTS2-created variable to measure engagement in work or education in the post-high school years. This clustered variable was derived from a composite of three answer choices (the youth had a paid job in the past two years, the youth attended any type of postsecondary school in the past two years, or the youth had training in specific job skills since high school).

Discussion

The analyses we performed indicated that there are numerous significant relationships between the receipt of instruction in ECC-like content areas and meaningful outcomes, such as employment, postsecondary training, and engagement in social

activities. For example, there was evidence of a significant relationship (in Waves 1, 2, and 4 of the NLTS2) between youths who were totally blind or had low vision having a paid job and youths who received career counseling, help in finding a job, training in job skills, or vocational education while they were still in school. Although this relationship was not significant in Wave 3, the results for this wave differed in such a way from the other three waves that it seemed likely that the difference was due to chance. The data in the analysis of Wave 3 for research question 3 were far removed and numerically distant from the rest of the points analyzed for the other three waves involved in research question 3. However, the consistency between the results for the other three waves that showed significant relationships was found to be even more remarkable.

There was also a significant relationship between youths with low vision who had participated in volunteer efforts or community service and youths who had received career counseling services while in school across all four waves of data. However, less than a third of the youths with low vision and less than a quarter of the youths who were totally blind received such services. **The results indicated that a stronger emphasis on career counseling and assistance with employment could very well prove beneficial to young people with visual impairments.**

For the youths who were totally blind, there were significant relationships between the use of braille and attending a postsecondary institution since high school and having obtained employment in Wave 4. Likewise, there were significant relationships between the use of

assistive technology and the receipt of O&M services while in school and having a paid job in Wave 4. In addition, there was a significant relationship between being engaged in employment or postsecondary school in the past two years and training in specific job skills since high school and having received O&M services. This finding was notable because it expanded on the relationships established in the area of career education and employment or postsecondary outcomes and lent support to the hypothesis that instruction in both braille and O&M may well lead to positive outcomes for youths with visual impairments.

A number of areas of the ECC, such as career education (captured through items specific to career counseling, O&M, the use of assistive technology, social interaction or engagement, and the receipt of braille instruction) were found to be significantly related to each other as well as to employment or postsecondary training outcomes. For example, there were significant relationships between youths with low vision using assistive technology and using braille, engaging in social activities, attending a postsecondary institution, and finding employment. These positive indicators underscored the value of having language related to instruction in braille, O&M, and assistive technology in federal legislation.

Some of the most positive and exciting results of our analyses were in the social skills content area, in which numerous relationships were found between being invited to social activities with friends for the youths with low vision. We found numerous significant relationships between involvement in social activities and the use of assistive technology. For

example, there were significant relationships between being invited to social activities with friends and both knowing how to use and using a computer for homework and school assignments, for playing games, for accessing the Internet, for e-mail or instant messaging, and for taking part in chat rooms. Assistive technology was integral to these relationships, because it is typically necessary for individuals with low vision to use assistive technology (such as screen-reading or screen-enlargement software) to access computers. These findings are notable because they expand on the relationships that were already established by this study that related the use of assistive technology to increased performance in several other areas of the ECC that were also indicative of successful employment and postsecondary training outcomes.

Although more information will be provided when the results of the final wave of NLTS2 data are released, these preliminary analyses underscore the importance of training in disability-specific skills in the lives of youths with visual impairments (both those who are blind and those with low vision). Additional research on the other areas of the ECC that are not evidenced in this report on the NLTS2 secondary analyses is needed and encouraged by the positive relationships that were uncovered in these preliminary findings. Research that further explores the NLTS2 data for evidence of the impact of self-determination on employment and community engagement outcomes, for instance, may help teachers and parents to prepare youths for life beyond home and secondary school. Research that explores how computer use and assistive technology skills may enhance

social interactions seems both viable and important for the well-being of youths with visual impairments as they strive to establish relationships with others. Finally, further exploration of purported best practices in career exploration and job training may help set the stage for positive employment outcomes that have so far been elusive.

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