

## **The Impact of an Electronic System as a Decision Making Tool for Special Education**

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### **Abstract**

*Besides anecdotal data there is very little work done in measuring the effects of hypertext electronic systems as decision making tools. The purpose of this study was to evaluate the impact of an electronic system for storing, referencing, and manipulating special education regulations. Such an electronic system was developed and evaluated using a random sample of secondary school administrators. Data, comparing administrators' knowledge of the regulations, were collected on two cohorts of school administrators (those who used software that allowed them to electronically access special education regulations and those who used print material). Statistical interpretation of the results revealed a positive impact of the electronic system. Usage of the system resulted in measurable improvement of special education knowledge.*

**Keywords:** effects of hypertext, decision making, special education regulations, school administrators.

### **Introduction**

In Virginia, the Regulations Governing Special Education Programs for Children with Disabilities specify that in order to facilitate day-to-day operations, local education agencies (LEA) must appoint a special education administrator. In turn, the special education administrator may appoint a designee to implement services for students within each school. This designee is most often either the building principal or assistant principal.

To comply with the responsibilities of the law, principals must have a clear understanding and knowledge of the law, must be able to interpret federal and state mandates, must assure that due process rights of students with disabilities are upheld, and must meet the unique educational needs of each student as specified by law (Burrello, Schrup, & Barnett, 1992; Sirotnik & Kimball, 1993; Stainback & Stainback, 1989). Yet research indicates that principals are weak in the knowledge of the law and regulations for special education (Carver, 1992). Without adequate legal knowledge, principals are not prepared to assume leadership roles in special education programming and service delivery (Carver, 1992; Farley, 1992; Hirth & Valesky, 1989). However, research has found that even though principals indicate a weakness regarding the

regulations, the principals are making daily decisions regarding special education. In so doing, principals can place themselves and their school districts at risk of facing the legal consequences for misinterpretation or lack of administrative control over special education programs.

To protect themselves, their school districts, and the educational rights of their students, principals should have access to information that can guide their decisions regarding special education services. This informational resource has to be accurate, accessible, and adaptable (Billingsley, 1988, 1989; Carver, 1992; Farley, 1992; Laycock & Frantz, 1992). Additionally, principals could benefit from a tool that provides on-going training in any modifications made to the special education regulations. Frantz (1995) conducted a study that explored resources other than traditional printed special education regulations. The scope of this study was to develop and evaluate a software package, called *SLink*, that electronically stores and retrieves the Virginia Regulations Governing Special Education Programs for Children with Disabilities. It has been shown that the electronic version is motivational, updatable, inexpensive and responsive to administrator's on-going training needs (Frantz, 1995).

## **Method**

### **Study Design**

This study was designed to assess the effectiveness of *SLink* in storing, referencing, and manipulating special education regulations. The evaluation involved a two-month experimental study. The individuals involved in the study were secondary school building administrators of special education programs in the Tidewater area of Virginia. The sample was selected to represent potential users of the software. A pre-test-post-test control-group design with random assignment of subjects into control or experimental groups formed the methodology of the study. After a two-month experimental period in which members of the experimental group had access to the software, measures of the effectiveness of the software were collected.

The evaluation focused on the following question: How effective was *SLink* in providing the regulations governing the special education programs in Virginia? The research question was answered by exploring the following issues:

1. Did users in the experimental group access the electronic reference system as a resource for special education issues and programming?
2. How often did the users access the software?
3. During the decision-making process, when was *SLink* most often accessed by the users?
4. Did the users find *SLink* effective in providing the regulations?
5. As a result of using *SLink*, was there an improvement in the users' knowledge of the special education regulations?

This article focuses on the last question since its answer constitutes the principal measurement of impact of such an electronic system.

## Sample

The sample consisted of principals who are administrators of special education programs in their school building. Those principals had access to a computer and were computer literate. Computer literacy was established via a survey (Frantz, 1995).

The research site for piloting the prototype software focused on public school districts in the Tidewater area of Virginia. Each school district in the Tidewater area was contacted through a written proposal that outlined the project, tied the project to the current objectives of the school district, and delineated the expected commitment in terms of time and resources by each participating school district and the parties carrying out the experiment. Fourteen school districts agreed to participate. All the secondary schools in each school district participated in the study.

The accessible sample consisted of 50 school administrators of special education programs who were either assistant principals or principals. In some schools, the administrators of special education programs included both principal and assistant principal. A list of the administrators was compiled using the *Virginia School Directory*. A random selection of administrators was contacted by telephone until one-half of the sample voluntarily agreed to participate in the study; these participants were assigned to the experimental group. During the telephone call, a detailed explanation of the project was provided with a clear statement explaining the expected commitment from the participants. The remaining principals not contacted served as the control group. Each respondent was given a code number at the beginning of the research, representing school districts and individual schools. The codes were used to ensure anonymity and thus produce a high return rate of the surveys. Demographic information was collected on participating principals' schools that included the total student population and the total number of students receiving special education services. This information was received from the Virginia Department of Education, Monitoring and Grants Division and represents the count of children receiving special education services in the state.

The demographic data have been divided into three categories: 1) a classification of the respondents from both the control and experimental groups as either principals or assistant principals in charge of special education programs; 2) a review of the special education population served by each school; and 3) a review of the experimental group's current level of computer skills.

**Classification of respondents.** Forty-seven building administrators in charge of special education programs took part in the study. Of the 26 respondents in the experimental group, 13 were principals and 13 were assistant principals. In the control group of 21, 13 were principals and eight were assistant principals. This represented a total of 26 principals and 21 assistant principals. Respondents from both groups were considered appropriate for purposes of this study.

**Special education student population.** The Virginia Department of Education provided individual school's population data reflecting the number of students served under each special education program.

In Virginia, the Department of Education places schools into three groups that are representative of the following sizes of the student body: small (under 500 students), medium

(500-1000 students), and large (over 1,000 students). Schools were placed within these categories by multiplying the size of the special education population times ten (based on the U.S. Office of Education's report that indicates, on average, special education populations represent approximately 10 percent of the total school population [Sage & Burrello, 1986]). These figures demonstrated that there was not a statistical difference between the control and experimental groups regarding size of special education population (see Table 1).

TABLE 1. Numbers and Percentages of Disabled Student Populations

	SMALL X<50		MEDIUM 51<X<100		LARGE 101<X	
	#	%	#	%	#	%
Control	4	19%	8	38%	9	43%
Experimental	4	16%	10	38%	12	46%
Total/Average	8	17%	18	38%	21	45%

**Instrumentation**

A survey entitled *Compliance Issues in Special Education* was developed and served as the tool for evaluating the impact of *SLink*.

**Survey Development.** With the advice of three supervisors from the Virginia Department of Education representing special education issues, the *Compliance Issues in Special Education* scenario information and format was established.

The survey was developed to be as non-threatening as possible in both wording and content. It consisted of 14 scenarios in which an administrator made a decision concerning a special education issue. Four scenarios involved legal issues that had not been changed with the amendments to the Education of the Handicapped Act (EHA). Five scenarios were selected that dealt directly with legal issues that had been changed with the amendments to EHA by the Individuals with Disabilities Education Act (IDEA). Five other scenarios involved issues that are not specifically clear in either Act and that have been answered instead by the courts through litigation.

The respondent was asked to determine if the administrator in the scenarios had made a correct decision, based on the Virginia Regulations Governing Special Education Programs for Children with Disabilities. The respondent could respond by indicating either "in compliance" or "in violation" of the regulations. The answers to the scenarios were grouped into a category called *Issues*. Principals were asked to identify the specific violation the scenarios represented. The answers to the violation questions were grouped into a category called *Specificity*. The findings from these two groups were reported as two variables that would be considerations in determining the impact of *SLink*.

The hypothetical scenarios were based on legal areas that have previously been identified by the Compliance Department (Virginia Department of Education) or taken as position statements of the Virginia Department of Education. The scenarios were used with permission from manuals prepared by the Virginia Department of Education for statewide principals' training programs.

**Panel Review Procedures.** After the survey was developed it was given to a panel of reviewers. The panel consisted of the following members: three building level principals who were administrators of special education programs, two professors of special education, one professor of computer science, and two representatives from the Virginia Department of Education. Modifications were made based on suggestions from the panel. The panel members were asked to review the survey for a second time to reach consensus on the content validity of the survey.

**Additional Review.** Upon completion of the final draft of the survey, an additional review was conducted with a review panel consisting of the following members: one school principal, one assistant principal who was an administrator of special education programs and the school disciplinarian, one supervisor of special education programs from the Virginia Department of Education, two professors of education, and one professor of computer science. The members were asked to examine the survey and by using a "yes" or "no" response to indicate if the survey met the following criteria: a) its content was valid, b) it was easily understood, and, c) it was relatively easy to complete. The pilot test indicated six "yes" and zero "no" responses for each of the three criteria. In summary, the respondents felt the survey met all criteria.

**Survey Design.** The *Compliance Issues in Special Education* survey was designed in a pamphlet format. The first page of the four-page survey contained a letter to the administrator. The letter introduced the *SLink* experimental study by providing a brief review of the literature that supported the experiment. Also, the letter revealed general background information of the sample and described how the sample would be used in the experiment.

Respondents were told the length of time it would take to complete the survey and the due date for its return. The respondents were informed in the first letter that a subsequent survey would follow the experimental use of the software. Phone numbers were given for any additional questions concerning the survey, and a stamped self-addressed envelope was provided.

### **Data Gathering Procedures**

The survey *Compliance Issues in Special Education* served as a pre-and post-survey evaluation of the principals' current levels of knowledge regarding special education law. At the beginning of the experiment, secondary school principals who were in both the control and experimental groups were mailed the *Compliance Issues in Special Education* survey and a letter explaining the project. Subjects were given two weeks to return the survey. A stamped self-addressed envelope was included. A total of 47 surveys were mailed. Those not returning the survey within the specified two week period were called to ensure they had received the survey and to encourage them to return it. Respondents were assured of the confidentiality of responses. Participants were identified by code number only throughout the experiment.

During the evaluation of the *SLink Project*, the experimental group received the following information in a packet: a letter that explained the project and expectations of participants, the prototype software, *SLink*, a manual for the software, and a self-addressed return envelope for the software. The software was to be returned at the end of two months.

During the two months that the experimental group had access to the software, each subject in the group was asked to use and incorporate the software in his/her daily administrative decisions concerning special education issues. After the experimental phase, a post-survey was conducted with the sample, using the *Compliance Issues in Special Education*. A letter was included with the mailing that explained once more the *SLink Project*. Furthermore, the respondents in the control group were asked to use the written version of Virginia's Regulations Governing Special Education Programs for Children with Disabilities when identifying the violation. The respondents in the experimental group were asked to use *SLink*. The experimental group also completed a survey, *SLink Review*, which gave them the opportunity to evaluate *SLink* regarding their actual use of the software.

### **Data Analysis Procedures**

The data derived from the *Compliance Issues in Special Education* survey were analyzed by comparing administrators' responses to sections on the *Issues* and *Specificity*. The first mailing of the *Compliance Issues in Special Education* was considered the pre-survey. The second mailing of the *Compliance Issues in Special Education* came at the end of the two-month experiment. The data from the pre- and post-surveys were analyzed using two Repeated measures ANOVA's with Group (experimental and control) and Time (pre- and post-survey) as the independent variables and Issues and Specificity score as the dependent variables.

## **Results**

The responses from the survey were statistically analyzed. The analysis provided the data that answers the research question regarding the impact of *SLink*. Prior to examining the evaluation results, a discussion has been presented concerning the survey's return rate.

### **Return rate**

With the pre-survey or first mailing of the *Compliance Issues in Special Education*, the experimental group had a 100% return rate (N=26), which consisted of one school being represented by both principal and assistant principal. The control group had a return of 21 surveys, which represented a return rate of 87.5 percent. In actuality, the return rate of the control group represented 100 percent of the possible administrators participating due to a school system consolidation of two secondary schools in the fall and a death of one of the principals whose replacement became a principal already participating in the control group. Since these two events came after the original mailings, rather than increasing the number of the control group participants, it was determined that the original membership in both groups should remain constant throughout the remainder of the experiment because time was one of the controls for the

experimental phase of this study. The overall return rate of usable surveys for all available respondents was 100% (N=47). Similarly, with the post-survey or second mailing of the *Compliance Issues in Special Education*, the overall return rate of usable surveys was 100% (N=47).

### Impact

The improvement in knowledge was measured via a subjective and an objective dimension. The subjective dimension was derived by analyzing the opinions of the software users regarding their improvements in knowledge of the regulations. An objective dimension of the sample's changes in knowledge over a four-month period was measured by the findings from the pre-and post-surveys, *Compliance Issues in Special Education*. The results of these two dimensions are presented below:

**Subjective Measurement.** After using the software, the experimental group was asked if *SLink* helped to improve their knowledge regarding the regulations. Sixty-nine percent of the experimental group felt that their skills had "improved" and 27% reported that their knowledge had "somewhat improved." Four percent did not believe that their knowledge had improved. Therefore, 96% of the respondents believed that their knowledge of the regulations had improved after using *SLink* (see Table 2).

TABLE 2. Self-rating of Special Education Knowledge

Responses	greatly improved	improved	somewhat improved	not improved
Percentages	0%	69%	27%	4%

**Objective Dimension.** An objective measurement was achieved by analyzing the differences between the findings on the pre- and post-surveys using the *Compliance Issues in Special Education*, survey, administered both to the control and the experimental groups. Knowledge of special education regulations was associated with data in two distinct areas, *Issues* and *Specificity*. In the *Issues* section, the respondent had to state whether the actions taken by administrators were in compliance with the regulations. In the area of *Specificity*, the user had to cite the legal reference addressed in the particular scenarios.

The focus of the objective dimension centered on the following question: Was there an improvement in the knowledge related to the special education regulations as a result of using the software? The results of the knowledge question were analyzed by comparing the difference in performance of the two groups (control and experimental) over time. The analysis consisted of two Repeated measured ANOVAs with Group (experimental and control) and Time (pre and post) as the independent variables and *Issues* and *Specificity* scores as the dependent variables. Tables 3 and 4 provide the means and standard deviations for these analyses.

TABLE 3. Summary of Objective Evaluation (ISSUES)

GROUP	PRE-Treatment		POST-Treatment	
	$\bar{X}$	S	$\bar{X}$	S
CONTROL	11.286	2.373	10.571	2.537
EXPERIMENTAL	11.615	2.558	13.154	1.511

NOTE.  $\bar{X}$  refers to the MEAN of the sample scores. S refers to the standard deviation.

The analysis for *Issues* indicated significant effects for Group ( $F(1, 45) = 7.33, p < .01$ ), Time ( $F(1, 45) = 52.88, p < .001$ ), and the Group by Time interaction ( $F(1, 45) = 28.73, p < .001$ ). A graphical presentation of the interaction is presented in Figure 1. Follow-up analysis indicated that the interaction was caused by increased scores of the experimental group while the control group remained the same. The analysis showed the groups to be equivalent at the pre-survey, but unequal at the post-survey.

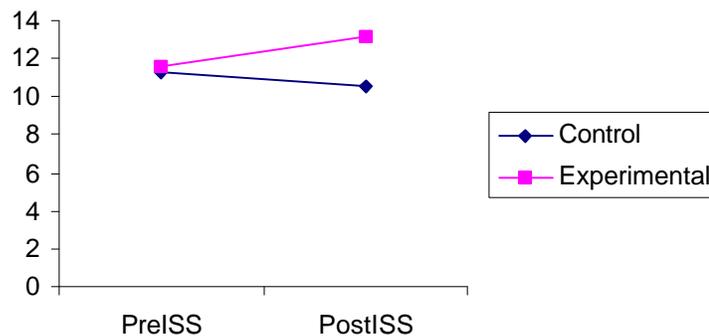


FIGURE 1. 2 x 2 ANOVA for Issues

TABLE 4. Summary of Objective Evaluation (SPECIFICITY)

GROUP	PRE-Treatment		POST-Treatment	
	$\bar{X}$	S	$\bar{X}$	S
maximum = 14.0	—	—	—	—
CONTROL	2.000	2.976	2.905	3.275
EXPERIMENTAL	0.000	0.000	8.808	5.602

NOTE.  $\bar{X}$  refers to the MEAN of the sample scores. S refers to the standard deviation.

The analysis for *Specificity* indicated significant effects for Group ( $F(1, 45) = 6.96, p < .05$ ) and the Group by Time interaction ( $F(1, 45) = 29.48, p < .01$ ). A graphical presentation of the interaction is presented in Figure 2. Follow-up analysis indicated that the interaction was caused by vastly increased scores of the experimental group from the pre- to post- surveys while the control group grew only slightly. The analysis also showed the groups to be nonequivalent at the pre-survey and the post-survey. The Experimental group scored significantly lower than the control group at the pre-survey and significantly higher at the post-survey (see Figure 2).

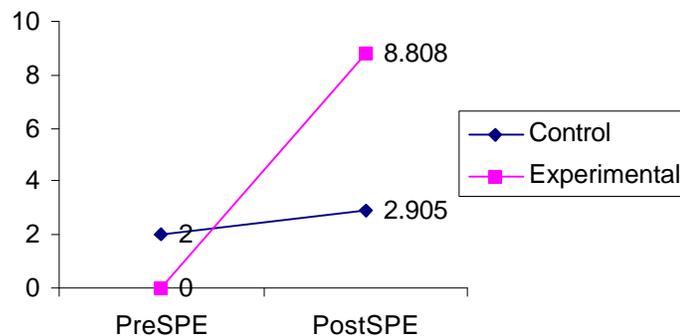


FIGURE 2. 2 x 2 ANOVA for Specificity

### Conclusion

In the field of education, instructional leaders must know the regulations governing the assessment, curriculum, and instruction of all students. An area of special concern is the regulations governing programs for students with disabilities. Having immediate and accurate access to the most current regulations are critical problems for administrators of special education programs. One means of providing the regulations is the computer. The purpose of this study was

to evaluate the impact of an electronic system, called *SLink*, used for storing, referencing, and manipulating special education regulations.

For the evaluation a controlled experiment was conducted in Virginia school districts. The research project used a random sample of secondary school administrators from 14 school districts. The sample frame participants were given a survey to identify their knowledge of the *Virginia Regulations Governing Special Education Programs for Children with Disabilities*, 1994. For a trial period of two months, the experimental group was given the software, *SLink*, that allowed them to electronically access the regulations. After the trial, the entire sample frame was re-surveyed.

Statistical interpretation of the results revealed a positive impact of the electronic system. Usage of the system resulted in measurable improvement of special education knowledge.

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