The Evolving Role of School-based Technology Coordinators in Elementary Programs

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Introduction

While much has been written about the potential of computers to enhance teaching and learning, a wide range of research studies and reports suggest that K-12 schools are not fully realizing the potential of new information technologies. One recent report suggests that while technology implementation in education is improving, only 24% of schools are using computers effectively (CEO Forum, 1999). Commonly cited reasons include inadequate computer resources, lack of teacher preparation, lack of planning time, and lack of on-site support (CEO Forum, 1999; National Center for Education Statistics, 2000; Ronnkvist, Dexter, & Anderson, 2000; U.S. Congress. 1995). Several studies (Evans-Andris, 1995; Marcovitz, 1998; Moallen & Micallef, 1997; Ronnkvist, Dexter, & Anderson, 2000; Strudler, 1995-96, Strudler & Gall, 1988) have documented ways in which effective technology coordinators have helped schools to overcome these impediments to computer implementation. Despite clear evidence supporting the need for such positions, however, most school districts have been hard pressed to allocate funds on a large-scale to support released-time technology coordinators (Ronnkvist, Dexter, & Anderson, 2000).

In 1997, the Clark County School District (CCSD) in Las Vegas, NV approved a plan to provide released-time coordinators to facilitate technology integration in all of its K-12 schools. This paper documents the implementation of that plan in CCSD's elementary school programs. It begins with some background information, followed by a description of the study, the results obtained thus far, and a discussion of the findings and their implications for practice.

It is hoped that this research will provide increased understanding of the long-term problems involved in integrating technology in schools as well as effective strategies for overcoming these problems. Furthermore, its findings may help technology coordinators be more effective as agents of change and enable their supervisors to provide better guidance and support.

Review of Related Literature

The role of instructional computer coordinator emerged during the 1980s along with the proliferation of computers in K-12 schools (Barbour, 1986; Moursund, 1985). Electronic Learning's first annual computer coordinator survey (Barbour, 1986), revealed the following:

1. Job descriptions vary greatly.

2. Only 21 percent of the respondents actually hold the title "computer coordinator"; the other 79 percent function in that role on a de facto basis.

3. Eighty percent of school computer coordinators who responded fulfill their role as an additional responsibility; only 4 percent fulfill their role on a full-time basis, while 16 percent function on a part-time or "released" basis.

Results from further national surveys (Bruder, 1990; McGinty, 1987; Ronnkvist, Dexter, & Anderson, 2000) have documented the growth and challenges of this evolving role. The most current of those surveys reports the following (Ronnkvist, Dexter, & Anderson, 2000):

1. Eighty-seven percent of schools surveyed have technology coordinators, but less than one of five of them (19%) reported having full-time coordinators.

2. High schools were twice as likely to have full-time coordinators than were middle and elementary schools.

3. Technology coordinators provide more technical support than instructional support to teachers integrating educational technology.

4. Teachers in schools with high quality technical and instructional technology support are more likely to engage in more and varied uses of technology in their schools.

Various case studies (Evans-Andris, 1995; Marcovitz, 1998; Moallen & Micallef, 1997; Strudler, 1995-96, Strudler & Gall, 1988) have provided rich descriptions of the work that technology coordinators perform. One longitudinal study, consisting of an initial investigation (Strudler & Gall, 1988) and a follow-up (Strudler, 1995-96) reported on the skills and strategies used and the outcomes effected by three exemplary coordinators over a period of eight-years. Results across cases suggest that while barriers to increased technology use have been eliminated or minimized due to the work of the coordinators, many obstacles still remained. One finding of particular interest involves the coordinators' plans "to work themselves out of their jobs." Findings suggest that this ambitious goal appears to have underestimated the degree to which educational change with technology is a moving target that requires ongoing coordination and support.

Educational Computing Strategists Role in CCSD

In the spring of 1997, the Clark County School District (CCSD) in Las Vegas, NV approved a plan to provide a technology coordinator, later termed Educational Computing Strategist (ECS), to each elementary school in the district. CCSD is currently the sixth largest school district in the country and is the country's fastest growing major school district. The plan involved a three-year phase-in for elementary schools.

During the first year of the project in 1997-98, data were gathered on how 24 ECSs were spending their time while performing their role. Commonly cited functions included providing staff development, managing local area networks, providing for their own professional development, and carrying out miscellaneous non-technical duties (Anderson, D.G., 1998)

In 1998-99, an additional 45 ECSs were hired to bring the total number in the District's elementary schools to 69. Unfortunately, further funding for the full implementation of the ECS role was not forthcoming. Currently 69 ECSs serve CCSD's 160 elementary schools.

Methods

Phase I

In spring 1999 and fall 2000, surveys were administered at meetings of the elementary ECSs to gather data on various aspects of their role. The five-page survey, administered in April 1999 was adapted from a 17-page questionnaire for technology specialists designed by Becker & Anderson (1998). The return rate for our survey (n=57) was 100% since the surveys were administered and collected during the ECS meeting.

A second survey was conducted in September 2000. Based on the 1999 instrument, some items deemed less important were eliminated to pare the survey down to four pages. Again, the survey was administered during an ECS meeting for a return rate of 100% (n=63).

Both surveys addressed the following research questions:

1. How much time do ECSs spend performing the various functions of their role? How much time would they like to spend performing these functions?

2. How effective do ECSs feel in performing their role?

3. What are the perceived obstacles to greater integration of technology into the curricula?

4. What are the intended and actual accomplishments resulting from the ECSs work?

Data from the surveys were analyzed using SPSSx. Results were compared from the 1999 and 2000 surveys. In addition, findings were compared against those of Ronnkvist, Dexter, & Anderson (2000), who used the same Technology Specialist's Survey (Becker & Anderson, 1998) that served as a model for our surveys.

Phase II

Following the administration of the two surveys and preliminary analysis of the data, additional research questions emerged. We wanted to inquire further into issues of effective implementation of the role, some ECSs' dissatisfaction with their role, and how the role might evolve in the coming years. Specifically, we posed the following additional questions:

5. What recommendations do ECSs have for the effective implementation of their role?

6. What factors led to some ECSs not to return to their positions?

7. How should the ECS role evolve in the coming years?

To answer these questions, a series of interviews were planned. The Elementary District Coordinator (who serves as Co-PI of this project) contacted nine ECSs who have recently left that role to return to positions as classroom teachers. Of those, seven agreed to participate in an interview. In addition, we sought to interview a selected sample of ECSs who were deemed exemplary by their peers and deemed to be functioning at a high level of satisfaction. Members of the Elementary ECS leadership team were polled to identify people in each of the four regions in

the district who they believe meet these criteria. The results were compiled and six people were identified for interviews.

Semi-structured interviews were administered to address all of the research questions (i.e., the initial four questions and the additional three listed above). At the time of submission of this paper, all seven of the "non-returnees" were interviewed, as were four of the six "exemplary" informants. The remaining two interviews were scheduled, but not yet implemented.

All audiotapes were transcribed. Using the constant comparative method (Strauss, 1987), data analysis began as data were first collected and continued throughout the study. We began by reading the transcriptions of the interviews. Guided by the purpose of this study and general categories used in the surveys, we created a series of codes. Two of the researchers then coded sample transcripts, compared results, and modified codes as needed to establish consistency in the coding process.

We then reread hardcopies of the remaining transcriptions, identified illustrative comments, and marked applicable codes for each "chunk" of data. As the analysis progressed, we added a couple of codes to reflect topics that we had not anticipated. Subsequently, we used the ClarisWorks database and word processor components with embedded macros to transfer "chunks" of data from the transcripts (word processor files) into individual records in the database program. This allowed for assigning one or more codes to each "chunk" and subsequent searching and analysis of the data.

Results

Results of this study, based on survey and interview data gathered thus far, are organized by research questions. Some brief demographic information precedes these findings. Due to space limitations, questions five through seven, which were addressed during our Phase II interviews, will not be reported in this paper. Furthermore, interview data that address questions one through four will be cited sparingly.

Survey data from 1999 disclosed that a slight majority of the ECSs are male (54.4%). The ECS served an average of 64 teachers and 1149 students. In 2000, ECSs served an average of 80 teachers and 1352 students. 1999 surveys indicate that the typical ECS has been a classroom teacher from four to 11 years, while the median years teaching with computers is between four and seven. See Figure 1 for data pertaining to ECSs' teaching experience.

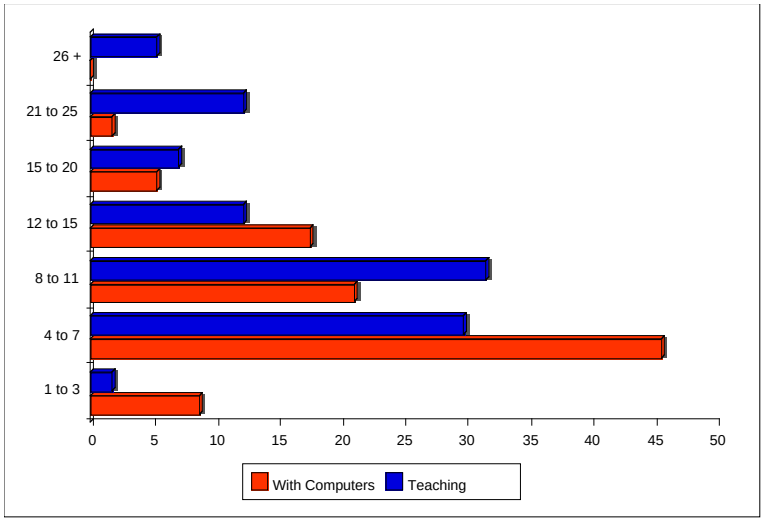

Figure 1: ECS Years Teaching Experience Years Teaching With Computers (n=57)

1. How much time do ECSs spend performing the various functions of their role? How much time would they like to spend performing these functions?

Table 1 shows the amount of desired and actual hours that ECSs reported for 1999 and 2000. Inexplicably, respondents reported spending less total hours performing their jobs in 2000 than they reported for the prior year, despite some additional assignments in 2000. One possible explanation is that more of the ECSs who are working at multiple schools are possibly not accounting for the amount of time they spend driving from one school to another or performing similar tasks at a second site. Another possible explanation is that ECSs, who have historically worked well beyond the required hours, are now less willing to do so. Interview data, however, don't support this theory. A third explanation might be that that the total hours reported by the ECSs are not accurate. We will seek to reconcile this finding by having study participants review a draft of this paper and subsequently participate in a focus group to discuss key findings and issues raised in the paper.

ECS Functions	1999 Actual	1999 Desired	2000 Actual	2000 Desired
Supervising and assisting classes of other teachers	10.43	8.25	6.26	8.79
Supporting or training individual teachers	6.03	7.15	6.51	6.82
Installing, troubleshooting, equipment & software	12.11	6.18	13.79	4.89
Planning and running staff development workshops	3.55	4.39	2.70	5.42
Writing lesson plans and units with other teachers	2.89	5.11	1.66	4.29
Selecting and acquiring resources	2.68	2.11	1.56	1.51
Other coordination and support	3.16	1.01	1.90	1.02
Total	40.85	34.20	34.38	32.74

Table 1: Actual and Desired Hours Reported Spent on Various ECS Functions

Survey data indicate that the coordinators spend a good deal of time providing technical support—clearly more than they desire. On the other hand, they report spending less time than they desire on functions related to instructional issues (e.g., staff development workshops and writing lesson plans and units with other teachers). Figure 2 illustrates the increasing amounts of time reported installing and troubleshooting hardware and software juxtaposed with the desired amount of time for these functions. These results are consistent with Ronnkvist, Dexter, & Anderson's (2000) findings that technology coordinators provide more technical support than instructional support to teachers integrating educational technology.

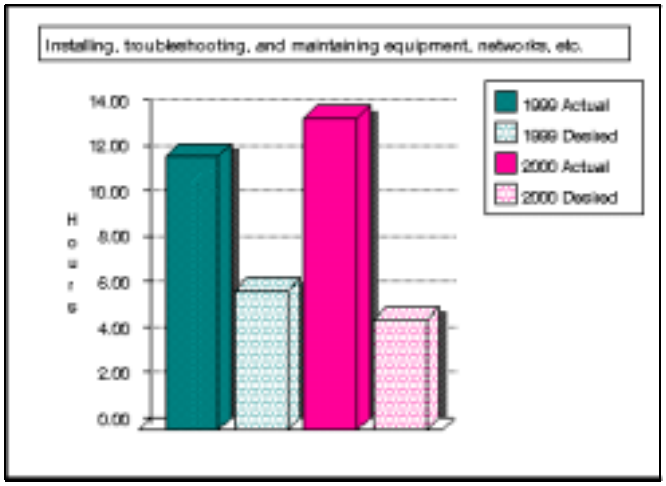

Figure 2: Hours Reported Performing Technical Functions

Interview data further confirm the technical demands of the job and the difficulty that the ECSs find in fulfilling their desired roles as onsite staff developers and curriculum consultants. Furthermore, survey data indicate that ECSs report not having adequate time to perform their role (see Figure 3). Additional technical responsibilities assigned to them likely account for this increasing perception reported in the 2000 survey.

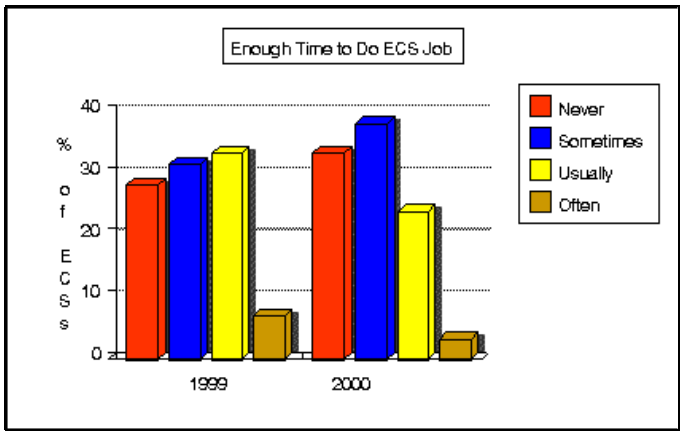

Figure 3: ECS's Responses to: "I Have Enough Time to Do My Job Well"

2. How effective do ECSs feel in performing their role?

Interview data indicate that the ECSs generally feel effective in their role. Many report a sense of accomplishment as they note that more teachers are seeking their services and using technology with their classes. One respondent characterized the progress that many noted, "They are coming in more and seeking my expertise. That has been a very good change."

One factor in respondents' sense of effectiveness reflects the amount of time that they spend performing particular functions. For example, ECSs reported an increase in effectiveness in performing technical functions such as troubleshooting and maintenance (see Figure 4) and a decrease in effectiveness regarding running and planning staff development (see Figure 5) and supporting and training individual teachers.

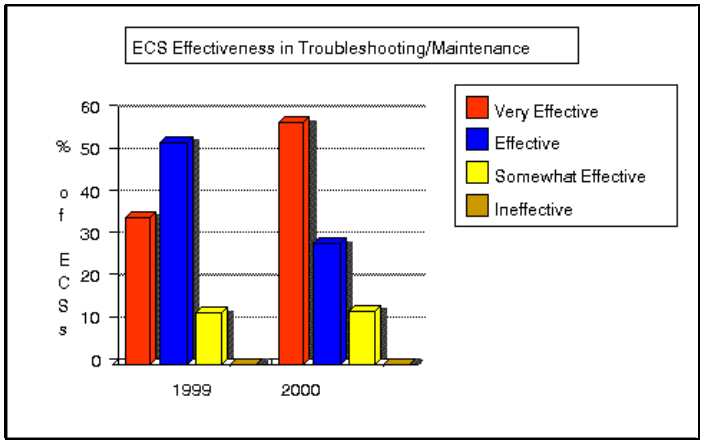

Figure 4: ECS Effectiveness in Troubleshooting and Maintenance

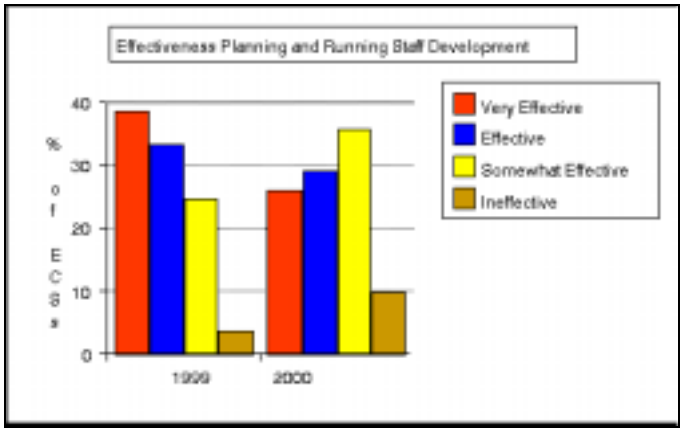

Figure 5: ECS Effectiveness in Planning and Running Staff Development

Interview data suggest that ECSs's sense of effectiveness varies with a range of factors related to their particular school context. Clearly, the technical expectations for the role are a key factor. While it appears that most coordinators feel positive about their ability to perform technical functions, one respondent noted a frustration shared by some others. She stated, "Having to address too much technical, I really felt like almost at times you had to be a CNE [Certified Novel Engineer]." Overall, it appears that an increasing emphasis on technical responsibilities, coupled with a larger client base, is making it difficult for many ECSs to feel effective in the professional development functions of their job. It should be noted that professional development and support was identified as a primary function of ECSs when the position was created.

3. What are the perceived obstacles to greater integration of technology into the curricula?

Coordinators identified the following obstacles to technology integration in their survey responses: limited budget, teachers' lack of interest or time, too few computers in classrooms, and obsolete technology. These impediments are consistent with other studies examining technology integration (CEO Forum, 1999; National Center for Education Statistics, 2000; Ronnkvist, Dexter, & Anderson, 2000; U.S. Congress. 1995). Additional obstacles raised in interviews include the lack of a clear vision for technology use and a lack of agreement among teachers, ECSs, and administrators regarding how to best implement the ECS role and achieve school goals.

Specifically related to the coordinator role, one respondent identified the competing demands placed on ECSs as an obstacle. She explained, "I really think that there needs to be both a technical person and an ECS addressing curriculum in the schools. I think it's too difficult to expect the ECS to address both."

4. What are the intended and actual accomplishments resulting from the ECSs work?

A large majority of ECS were in agreement with the general goals and job description as stipulated by the district— providing staff development and support, performing basic maintenance of hardware and software, and leading technology planning and coordination. One ECS characterized well what others are attempting and actually accomplishing. She noted, "My greatest successes were seeing teachers [have] that light bulb moment they always talk about with children"—when they discover an applications that really fit with what they are trying to accomplish in their classroom. Another shared a similar sense of accomplishment: "The teachers are actually using those things in the classroom. And they are so excited about doing it too."

Other respondents discussed the accomplishment in helping teachers build a vision for technology in their school. For example, one explained that "teachers are excited about the technology and they're thinking ahead to how they could integrate that and [they are] beginning to dream a little bit…." This outcome reflects a clear sense of progress toward the ultimate goal of empowering teachers and ultimately transforming teaching and learning with technology.

Discussion and Implications for Practice

This study further documents the complexity involved in effectively integrating technology in school programs. Clearly, basic technical functions that coordinators perform are prerequisite to achieving the higher order outcomes that may enhance teaching and learning in significant ways. The goal, then, is to establish an efficient solution for providing technical maintenance and support so that coordinators have sufficient time to pursue the "higher order" goals of providing staff development, curriculum consulting, and follow-up support. Data from this study confirm that while the basic technical functions are being consistently provided—a positive outcome in its own right--a variety of factors contribute to a coordinator's effectiveness in supporting technology integration and curricular change.

Participants in this study offered a range of recommendations regarding how to reap the greatest benefits from the ECS role. Some emphasized the need for administrative support and vision for technology use. Clearly, this appears to be a common factor among schools with effective coordinators who report making good progress with technology integration.

Others recommended the need for increased technical support from alternative sources (e.g., technicians, students, other teachers). Regarding staff development, some argued that principals should mandate attendance and participation. Others favored a more patient approach in which teachers would seek the services of ECSs based on their motivation and readiness.

Overall, it appears that there is great benefit derived from the work that ECSs perform. Specifics regarding the implementation of the role, however, require further study. In the best of all worlds, there would be adequate funding to support all of the coordination and implementation support necessary for effective technology integration. But in a world of limited resources, optimal implementation of a school technology coordinator role must be examined. Can some of the technical services that ECSs provide be delivered in a more cost-efficient manner? Should access to an onsite staff developer and curriculum consultant be viewed as an entitlement or "basic service" for all teachers or should it be viewed as a limited resource? If viewed as a limited resource, should those schools receiving such services require that teachers participate in technology-related staff development?

These, and other related questions will be addressed through a more detailed analysis of interview data and a follow-up focus group. Results will be forthcoming at our NECC 2001 presentation and subsequently discussed in an extended version of this manuscript.

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