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ABSTRACT

This paper addresses the issues involved in the current applications of computers, both microcomputers and mainframe, by local (LEA) and state (SEA) education agencies' evaluation-research-assessment departments. The results of a recent survey of randomly selected local and state evaluation units are presented (20 LEA/20 SEA), as well as an integration of some of the salient points from existing publications on the use of computers by evaluators. The paper focuses on the range of applications of computers, problems in application, and primary needs in the utilization of computers for evaluators. Its contents include: (1) study overview and purpose; (2) study design, including target population, SEA and LEA samples; (3) survey design; (4,5) SEA and LEA results, including regional and national profiles; and (6) the conclusion, which briefly reviews the findings, discusses some of the implications, and projects future developments in computer use by evaluators. The interview form is appended. (JB)

paper and report series

No. 109 APPLICATIONS OF COMPUTERS IN LEA AND SEA EVALUATION UNITS

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No. 109 APPLICATIONS OF COMPUTERS
IN LEA AND SEA EVALUATION UNITS

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March 1935

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PREFACE

The Research on Evaluation Program is a Northwest Regional Educational Laboratory project of research, development, testing, and training designed to create new evaluation methodologies for use in education. This document is one of a series of papers and reports produced by program staff, visiting scholars, adjunct scholars, and project collaborators--all members of a cooperative network of colleagues working on the development of new methodologies.

How are SEA and LEA evaluation-research-assessment units using computers in their work? What hardware and software arrangements are proving most effective? These and related questions are addressed in this report of a national phone survey of SEA and LEA unit directors.

Nick L. Smith, Editor
Paper and Report Series

CONTENTS

APPLICATIONS OF COMPUTERS IN LEA AND SEA EVALUATION UNITS

Study Overview and Purpose

This paper addresses the issues involved in the current application of computers, both microcomputers and mainframe, by LEA and SEA evaluation-research-assessment departments. This paper presents the results of a recent survey as well as integrates some of the salient points from existing publications on the use of computers by evaluators. This paper focuses on (1) the range of applications of computers, (2) problems in application, and (3) primary needs in the utilization of computers.

Presently no summary is available concerning the use of computers by the evaluation-research-assessment units of local education agencies (LEAs) and state education agencies (SEAs). Information pertaining to LEA/SEA evaluation units' use of computers is based primarily on personal experience and anecdotal reports. Survey studies have been conducted focusing on the size and function of state level evaluation units (Smith, 1984) and even national descriptive studies of evaluation practice (Boruch and Cordray, 1980; Raizen and Rossi, 1981). From these investigations, it appears that SEA evaluation units have undergone a dramatic reduction in personnel, with fewer evaluations being conducted.

> The median FTE in 1978 was 7, but only 3.5 in 1983 . . . A median of 24.5 evaluations were conducted in 1978, but only 8.5 in 1983.
>
> (Smith, 1984, p. 3)

Given this reduction in staff, what impact has the arrival of computers had? What are the profiles of computer use? Where is their application particularly successful? The context and status of current practice will provide a useful basis for addressing these questions and projecting future trends.

The first section of this paper describes the population surveyed. The second part outlines the study design, and the final section summarizes the results of this research.

Study Design

The intent of the investigation reported here was to study the current application of computers to the task of evaluation-research by SEA and LEA staff. The study had three major purposes: (1) to document current practices, (2) to identify problem areas, and (3) to investigate future trends.

Forty interviews were conducted for this research: 20 interviews of SEA research-evaluation units, and 20 interviews of LEA research-evaluation units. The following criteria were used in the selection process.

The Target Population

A definition of SEA research and evaluation units is difficult to ascertain. There is considerable variability in evaluation practices at both LEA and SEA levels (Caulley and Smith, 1980). For example, some state-level evaluation and research departments engage in a wide range of activities, such as consultation/technical assistance, evaluation studies, needs assessment, information provision, program monitoring, planning, policy formation, etc. On the other hand, other state departments restrict their activities to state-level testing or other singular requirements.

> One state, for example, has an office of research, evaluation, and testing, which is responsible for the evaluation of Title IV-C, while responsibility for the evaluation of Title I, Special Education, and Vocational Education is housed elsewhere in the agency.
>
> (Bracey, 1982, p. 13)

State compliance with federal laws, regulations, and court decisions is the responsibility of state departments of education. The influence from the federal level is extensive, even to the point of specifying which evaluation procedures are used and which programs are ultimately evaluated (Smith, 1982).

In addition to the federal influence, there are various elements within state governments which influence SEA evaluation. It is at this level that the special interests of legislators and the role of public opinion define the functions and activities of research-evaluation units. Foremost in directing state level agencies are statewide testing laws and state minimum competency graduation requirements.

> Obviously these legislature-designed evaluation tasks can create considerable difficulties for SEA evaluation personnel who must attempt to perform such evaluations. These legislative mandates may change the nature of evaluation for a given program or have even more wide ranging impact. . . Legislative mandated evaluations frequently involve short timelines . . . [and] the need to use evaluation data to justify continuation of desired educational programs influence the nature and timing of evaluation studies.
>
> (Smith, 1982, p. 11)

The decision rule used in this research to define what constituted an SEA research-evaluation unit was based on the type of unit activity and the centralization of the activity. Agencies chosen participated in three types of activities: evaluation, research, and assessment. These activities were operationally defined to include monitoring, assessment, planning, programmatic evaluation, research synthesis and testing management. Further, the units considered for study were centralized and operated at one location within the state system. This classification was therefore based on both function

and organizational structure. Those states which did not have centralized SEA evaluation-research units were excluded from this study.

The decision rule for LEA unit inclusion was similar. LEAs having over 10,000 students and a centralized evaluation-assessment unit were included in the target population. Their activities are characterized by assessment, monitoring, testing management, technical assistance on test data, and policy development. The role of assessment practices was more apparent for LEA units. Therefore, SEA units will be described as evaluation-research units, while the LEA units are referred to as evaluation-assessment units.

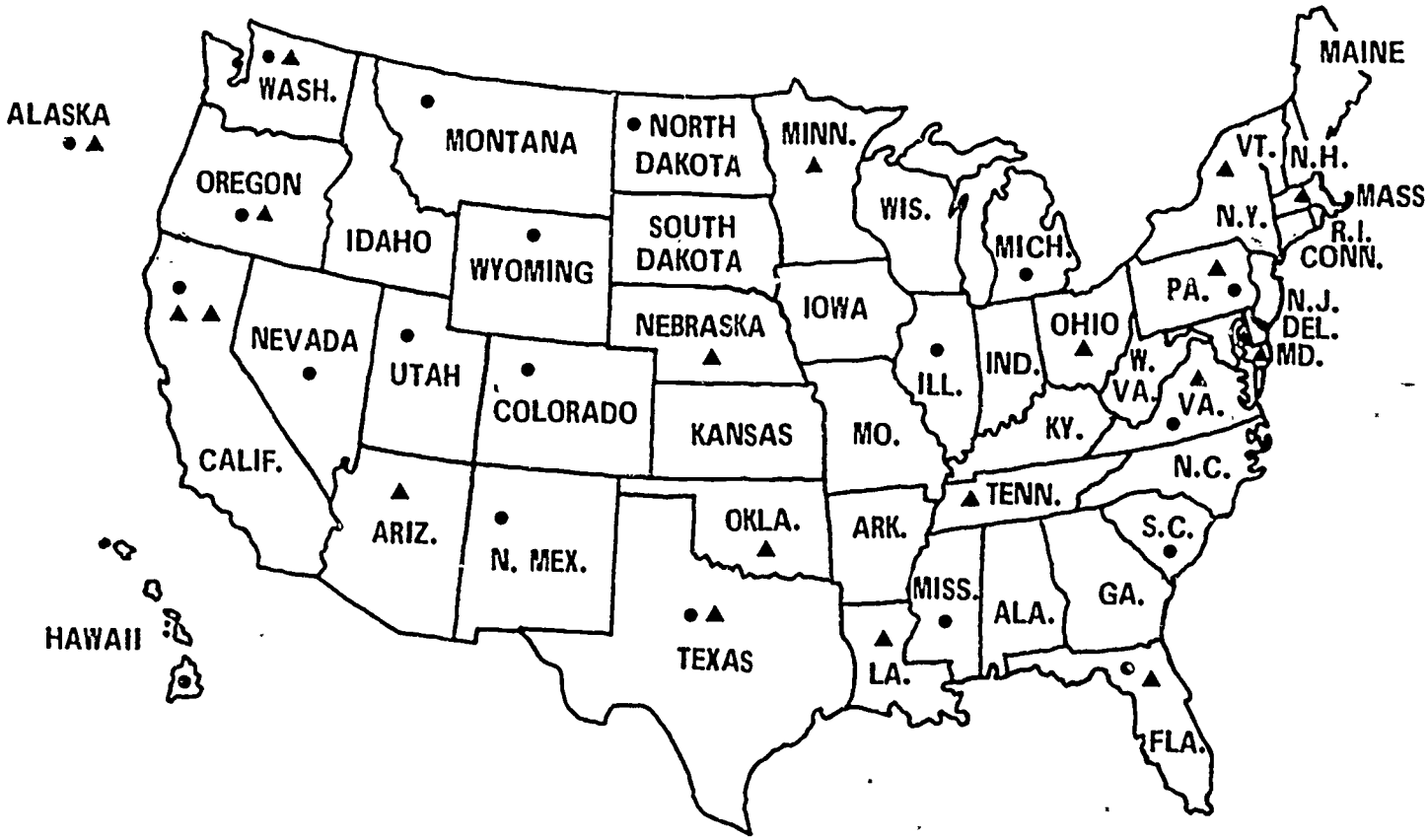
SEA Sample Selection

From a previously constructed master list of state-level evaluation departments, it was determined that 37 had centralized units. This list (dated 1978) contained the most current information available on centralized SEA evaluation departments. The total number of SEA units selected for this survey was 20. In the initial sample, the 6 states within the Northwest Regional Educational Laboratory region were included and a random selection of 14 of the remaining 31 states was made. Some states were found to have been misclassified as having centralized units, when they actually did not. These states were removed from the sample and replacements were selected. One case, New Mexico, was misclassified as not having a unit when it did.

Corrections to the master list were made as follows: Georgia and Maryland were misclassified as having state-level centralized evaluation-research units, but presently they do not; New Mexico does have a state level unit.

The map on the following page shows those states that were randomly selected. There appears to be a representative geographic distribution of states.

STATES PARTICIPATING IN NATIONAL STUDY
ON COMPUTER APPPLICATIONS BY EVALUATION UNITS



SEA selected = ●

Alaska	North Dakota
Washington	Texas
Oregon	Illinois
California	Mississippi
Nevada	Virginia
Utah	Florida
Montana	Pennsylvania
Wyoming	Hawaii
Colorado	Michigan
New Mexico	South Carolina

LEA selected = ▲

Anchorage	Memphis
Annapolis	Minneapolis
Boston	Norfolk
Buffalo	Omaha
Cleveland	New Orleans
Fresno	Philadelphia
Washington, D. C.	Portland
Pensacola	Seattle
Houston	Tucson
Long Beach	Tulsa

All states in the Northwest Region were included in the study because the Laboratory has a particular responsibility to this population. The six regional states are Oregon, Washington, Idaho, Montana, Alaska, and Hawaii. Idaho did not have a state-level centralized evaluation-research unit. Therefore, the final regional sample was 5 and a replacement was selected to insure a total of 20 states fitting the criteria. From a population of 36 qualifying states, the total sample selected for the study was 5 regional states plus 15 randomly selected other states.

LEA Sample Selection

The LEA sample selection process was less complicated than the SEA sample selection because the national master list of LEAs was more current than the SEA master list. This list was a random selection of 75 LEAs drawn from a Center for the Study of Evaluation (UCLA) list of 510 LEAs with a 10,000 or more student population. A random selection of 20 from the 75 was made.

The selection was similar to the one used in SEA selection. If an LEA unit did not have a centralized evaluation-research component, then it was excluded and a random replacement was made.

From the original 20 selected, 2 regional LEAs did not have evaluation-research units, and replacements were selected. The total LEAs with evaluation-assessment units sampled was 20, 3 within the Northwest region and 17 throughout the nation. The map indicates the cities selected for LEA representation.

Survey Design

A phone survey was conducted of the directors or assistant directors of evaluation units in 20 state departments of education and 20 local school districts. Respondents were interviewed in February and March of 1985.

A semi-structured interview instrument was developed and revised on the basis of pilot trials and expert review (see copy of survey instrument in the appendix). The interview required between 20-30 minutes, and there was 100 percent completion of all 40 interviews.

The benefit of telephone interviewing was that it could be easily adapted to the respondent's schedule and could be completed within the study timeframe (1 month). It also allowed for informal inquiry about technical questions.

At the time of the initial interviews, the focus of the study was on the use of microcomputers. It became immediately apparent that focusing only on microcomputers imposed an unrealistic limitation on the study of unit practice. If the study were to fully understand the role of microcomputers, it had to also address the use of mainframe and terminal computer systems. Microcomputer use must be examined within the full context of computer use to determine advantages, disadvantages, and types of application.

In order to develop a profile of computer use, respondents were asked, "Does your unit use computers in their work? If so, please describe your system."

Hardware arrangements were recorded as well as often-used software packages. Mainframe functions and packages were also inventoried.

SEA Results

The section on results is divided into two parts: SEA profiles by region and nation and LEA profiles by region and nation. Responses to questions 1-5 on the survey instrument are summarized. These questions refer to the profile or form of computer application. The second grouping is made from the responses to questions 6-8 which ask about problems and proposed solutions. A third cluster relates to the answers of a more

general inquiry on advantages of computers, their future, and other concerns pertaining to the use of computers by evaluation-research units.

SEA Profile--Regional

The computing functions available to the SEA evaluation-research unit were responsive to the unit's main tasks. The main tasks of most SEA units included the provision of evaluation and technical assistance, monitoring projects, and organizing needs assessment. Computing functions to accomplish these tasks included data processing, statistics, word processing, and spreadsheets. Computer use profiles refer to the organization of computer use by hardware. The four basic models are:

Model 1 - only microcomputers

Model 2 - mainframe with terminals
no microcomputer

Model 3 - both microcomputers and mainframes (two separate systems)

Model 4 - microcomputers interfacing with mainframes

All of the five Northwest region research and evaluation units had computer services. Computer use Models 1, 2, and 4 were represented. Two states with Model 2 had budgeted for interfacting microcomputers for this year. The Model 4, in which the microcomputers can interface with the mainframe, appears to be the desired model for the Northwest region as well as for most other states.

Most SEA units required the flexibility and access of microcomputers and the storage and power of a mainframe; together these two computer resources can function in a highly compatible mode. The advantage of such an interactive system is that an evaluator can maximize each of the technological resources (the mainframe and the microcomputer). Mainframes are particularly useful for some tasks, while microcomputers are better suited for others.

The tasks generally addressed by microcomputers are data base management, spreadsheet development, and graphics. Mainframes are used for statistics and data base. In all the state education agency (SEA) units surveyed, the word processing tasks were performed on "dedicated stations" or terminals, or the mainframe by clerical personnel.

Two regional states represented by Model 1 disdained the application of a mainframe, while the other three SEA units noted that the mainframe was used for specific tasks, such as statistics and data base management. The major advantage of the mainframe was its storage and power, but, overall, the disadvantages of wait-time, keyboarding, and lack of control outweighed the advantages. The most responsive system was considered to be Model 4.

The microcomputer software used by the regional SEA evaluation-research units included Visicalc, Lotus 1-2-3, d base II, Wordstar, and SuperCal 2. The types of hardware represented were IBM PC, IBM XT, Apple IIc, TRS 100.

The salient advantages of using computers--both microcomputers and mainframe--were identified as speed, flexibility, and access. These three characteristics were consistently rated as the most important feature of computers. The second order of importance, which became the first order once computers are taken for granted, was the type of questions that one can ask. The following statement was repeated by almost all persons interviewed:

> Computers allow one to ask "what if" questions. Before, we did not have the manpower to attempt asking a "what if" question. Now, we have much more opportunity to do intensive exploration of the data. We can try out questions, and hypothesize, look at the data, and have more control over the process.

The answers to the last question, which concerned future needs, revealed the critical importance of linkages. All SEA unit respondents articulated their desire to have a system in which local districts could have access to state-level

information, and vice-versa. This shared information base would be a major advancement and was considered as a way to markedly increase productivity.

In summary, computer application represented by Model 4 represents the "state of the art" of computer use profile. In other words, this form is a blended system: both microcomputer and mainframe; in addition, the microcomputer interfaces with the mainframe. In computer terminology, this allows for a "smart" microcomputer. Computer application as described by Model 4 is complementary and comprehensive, and is responsive to the needs of regional SEA evaluation-research units.

SEA Profile--National

It is interesting that the four models identified within NWREL regional states appear to cover the range of applications throughout the nation. In addition to these models, three SEA evaluation-research units had minicomputers, although in two of the three states, the unit directors said that these "intermediary" computers would soon be phased out.

Table 1 presents the profile of the twenty SEA evaluation-research-assessment units sampled. Information is provided on type of models and number of professionals within the unit.

Table 1
Survey of SEA Evaluation-Research Units
N=20

	Model 1 (micros only)	Model 2 (mainframe)	Model 3 (micros & main)	Model 4 (Interfacing micros & main)
No. of states	3	5	7	5
Range of professional staff	1-3	4-21	3-35	5-55
Average number of professionals	2.3	5.2	15.1	20.3

Of the seven state units representative of Model 3, three of them placed "high priority" on developing interfacing capability. They indicated that this would be accomplished within the year. The five with Model 4 generally (1) expressed relief that the interface connection process was completed, (2) are now looking for appropriate software to upload and download specific data, (3) found that learning how to operate the interface process required at a minimum 6 months and in some cases almost a year, and (4) are now quite pleased with the results. The following statement by a director of evaluation in a western state department of education is representative of the remarks made by other directors.

> It was a great headache to get our IBM mainframe (4341) to interact with our micros. (Apple II+). We spent over 1 year in learning time--I mean mastering the upload and download without losing the data. We have ordered two more microcomputers: IBM PC and IBM XT and we hope that the updated terminal simulation package will provide us with a more compatible and workable system. Working out the special job control language from the Apple terminal was a real challenge.

Another respondent explained:

> It was certainly a learning problem--figuring out how to upload and download without losing data. But it has been invaluable for our purposes, because we now have access to data that has been certified as correct and is specific to my application--especially demographic information.

However, the survey findings revealed examples of less exasperating situations. An evaluation-research unit director from a north central SEA notes:

> The conversion on our mainframe was accomplished at the same time we had the microcomputers installed. So the system was integrated from the beginning. We are still working with some of the features, and it seems to be coming along okay.

It is apparent from Table 1 that the SEA evaluation-research units with more personnel have more complex facilities. This phenomenon is characteristic of growth patterns of larger systems. However, many lesser populated units also intend to

adopt the computer use arrangements represented by Model 4. Again, the argument is based on the specific features of both systems and the advantages of interfacing access.

All of the sampled SEA units reported that they had "dedicated" terminals specifically for word processing. The hardware equipment most represented was IBM 8100, Zerox 860, WANG, CPT, and AB Dick. Almost none of the microcomputers were used as word processing stations. Some of the professional staff developed rough drafts on a microcomputer, but the overwhelming norm was to give the handwritten draft to the word processing staff.

The hardware for the mainframes was almost uniformly supplied by IBM. The most represented model was the series 4300 (4331, 4361, 4381) which are classified as intermediate in terms of function and memory. A few SEA units had IBM 3080 and one had 3090, both of which are rated as large in terms of function, memory, and price.

The major problems fell into two categories. The first area of concern was staff training. Many directors of evaluation-research units reported their uncertainty about how to proceed with staff training. Some said they would not "push" for training, and their staff could make their own decisions about obtaining computer skills. On the other hand, some unit directors felt that a regular training program should be instituted. Basically, there was no consensus on this topic.

A more nomothetic issue was the problem of non-integrated statistical processes. For the majority of SEA units, most of the statistical methods they needed were resident in the mainframe, and almost invariably, the summary numbers had to be hand-entered when a microcomputer or word processor was used to prepare the final document. The statistical functions were uniformly performed by either SPSS (Statistical Package for Social Science) or SAS (Statistical Analysis System).

The problem of hand-entering was not as evident when the statistics were developed by programs on the microcomputers, because some microcomputer packages integrate statistical

summaries with other functions, such as word processing. The most frequently used such programs were Lotus 1-2-3, and the new SPSS-X package for microcomputers. Visicalc was also another common choice. A few units had written programs in which the statistical summaries were integrated into the other functions of the program.

It is interesting that maintenance was not a conspicuous problem area. As noted, most SEA units purchased IBM equipment and had good experience with their IBM service contract. Using one vendor seemed to be one method of handling maintenance. For example, one state used only WANGs and was very satisfied with them.

Finally, the consummate advantage of microcomputers was the control that the evaluation-research unit directors and staff felt they had. Repeatedly, the respondents noted that by having a microcomputer one was not "wedded to someone to key in data" or "waited for the host computer because of overload by too many users or it was filled to capacity." One key comment exemplifies the distinctive merit of microcomputers: "We are no longer just reacting to the data we receive from the mainframe. We can go out and initiate our own study, and this changes the nature of evaluation."

Suggestions of improvements to the system included requests for optical scan capability, integrated graphics, data tapes to replace keyboarding, and district linkages.

In summary, most computer systems used by evaluation-research units at state education agencies can be categorized by the four profiles. Of the 20 states sampled, 12 had both microcomputers and mainframes--Models 3 and 4. The "state of the art" appears to the system in which microcomputers can interface with the mainframe. The timely use of information is critical to evaluation-research units, and they have found the computer to be an invaluable asset. The morale, eroded in the past by reductions in personnel and budgets, seems to be improving. Many of the directors reported increased confidence, interest, and professionalism coincidental with the arrival of computers, particularly microcomputers. The incidence of "cyberphobia" was quite low and most everyone in the units seemed to have benefited from this responsive, accurate, and versatile technology.

LEA Results

The major tasks performed by most local evaluation units are associated with district-wide testing programs (Gray, Caulley, and Smith, 1982). Typically, this process includes selection of tests, data analysis, and reporting results to school boards. Some local education agency (LEA) evaluation units have the opportunity to do surveys and needs assessment. But few evaluation unit directors reported innovative activities (Gray, Caulley, and Smith, 1982). Generally, even the most active LEA evaluation units are circumscribed by financial constraints.

> Several LEAs noted that there is a shifting from evaluation to monitoring as funds dry up and monies are allocated to tangible activities, e.g., equipment and materials. A loosening up of evaluation requirements from SEA has also been reflected at the LEA level.
> (Gray, Caulley, and Smith, 1982, p. 35)

Computers are essential for operating any testing program. LEA evaluation units also use computers for proposal writing, planning, data management, and analysis, as well as reporting.

Twenty LEA evaluation units were selected. The survey completion rate was 100 percent. Again, the results are presented by regional LEAs, and by national LEAs.

At the LEA level, the evaluation-assessment functions could be organized by units, but in the agencies interviewed those functions were often imbedded within other organizational arrangements. Typically, there was no unit director, rather there was a program coordinator with a small staff whose tasks included testing, evaluation, needs assessment, but almost no research. Generally, these staff members were the respondents to the LEA survey.

LEA Profile-Regional

Of the six regional LEA units sampled, three had evaluation-assessment services. One was represented by Model 3, one by Model 4, and one by Model 3 that intended to develop interface capability this year. The staff in all three LEA units

were very interested in the application of computers. Two respondents were extremely knowledgeable and discussed the options of video disc technology, optical scanners, graphic plotters, and telecommunications.

Most of the microcomputers were IBM types (PC, XT), while the mainframes were IBM 4300 series, VOX series, and Honeywell. Mainframes were generally used for data management and statistics; the microcomputers were used for specific analyses, spreadsheets, word processing, and telecommunications.

The microcomputer software programs used most frequently by regional LEA units were Lotus 1-2-3, Lotus Symphony, and DB Master. Generally, the statistical calculations were performed on the mainframe using SPSS, and re-entered at the microcomputer level.

The attention to the role of microcomputers is increasing as microcomputers become more powerful. The goal of every evaluation-research unit surveyed was to have an IBM PC XT (or AT) in each of the schools. The respondents believed that this level of microcomputer was powerful enough to address most all of for the needs of both the schools and LEA units. All of the microcomputers would be networked, then data could be input by microcomputer to the mainframe, calculations done and returned to the microcomputer, therefore not tying up the mainframe.

One of the biggest concerns was the ability to access particular data. Item banks were being developed by districts in order to access directly an exact level of information. A comment by a program coordinator of an LEA unit illustrates this:

> We need to pull out specific information--for instance, how many kids who have been in a Chapter 1 program for 3 years have improved test scores or improved attendance?

The respondents were excited about the future of computer technology. Most of them considered Model 4 essential to accomplishing their tasks. One respondent commented

> with our budget reductions, the only way we can begin to fulfill our purpose--especially reports to the school board--is by having computers. What I would really like

is for the decision makers to understand the necessity of computers, especially microcomputers. We couldn't operate without them.

LEA Profile--National

Seventeen LEAs were randomly selected. National representation is similar to the SEA selection.

The function of most of the 17 LEA evaluation-assessment units was similar to the three regional units. One task that was included for many of these units, in addition to testing and monitoring, was maintaining small batches of information, for example, attendance by group, or quartile performance by groups.

Table 2
Survey of LEA Evaluation-Assessment Units
N=20

	Model 1 (micros only)	Model 2 (mainframe)	Model 3 (micros & main)	Model 4 (interfacing micros & main)
No. of states	0	3	9	8
Range of professional staff	0	1-4	1-32	1-15
Average number of professionals	0	3	8.1	5.7
Average no. students in LEA district	0	61,600	69,800	80,000

As with the SEA evaluation units studied, the LEA evaluation units' range of computer application is represented by the four models. It is interesting that more LEAs than SEAs had the Model 4 system. One might have presumed that, at the state level, resources for computers would be more available than at the local level. But, consistent with other reports, much of the development of computer resources has a grass roots basis (Gustafson, 1985). Therefore, it is not unusual to find certain local educational agencies with well developed computer systems.

Of those local districts having the Model 3 system, four had immediate plans to develop interfacing capabilities of their equipment. The pressing need for this improvement was described clearly and seemed to be felt more acutely at the local level than at the state level. Many respondents reported the pressing need to have all the schools in one district linked. A respondent from a local district in the eastern U. S. emphasized this problem:

> We have to have connections with each school. We have an urban situation and students move around a lot. Presently their files are hand-delivered. A hand-delivered system--using the mail, etc.--takes too much time, and there are the risks of losing the files. Often a student will need to be tested before classroom placement. This represents duplicated effort if we have his records, but they just have not been delivered. The problem of records not catching up in a timely manner is real for us.

The hardware profile at the regional level is similar to that at the national level. Combining the regional data with national, IBM mainframe was represented in 70 percent of the samples, the model usually being the 4300 series. There was greater variability in the choice of microcomputers. Although IBM PC, XT, and AT were used by 65 percent of the sample, Apple IIe, TRS 80, Sperry, and Victor 9000 were also being used.

Unlike the state level units, about one-third of the LEA evaluators used their microcomputers for word processing. The word processing programs included Wordstar, Volkswriter, Apple-Writer, and Displaywriter. Other software programs selected most frequently were Lotus 1-2-3, d base III, and Visicalc 2.

The range of microcomputer software is signifcantly greater in LEAs. The results from the SEA survey revealed a range of only 9 software programs, whereas LEAs reported a range of 14 different, frequently used, programs. It is possible that word processing software may account for this greater variability; nonetheless, it is an interesting distinction between the two levels.

Another differentiating factor is the U-shaped curve result relating to personnel and facilities. Findings from the LEA sample indicate that Model 3 units totaled more personnel than Model 4 units. In contrast, there is a linear trend (increasing) in the average number of students per district from Model 1 to Model 4.

The argument could be posited that technological tools, such as computers, are particularly useful for small staffs who are responsible for large numbers. Although it was out of the scope of this research, these findings suggest that an evaluation of technological development in relation to responsibilities and size of district would be appropriate in the future.

Some interesting variations in computer application appeared at the LEA level. Two situations are particularly worthy of acknowledgement--one in which an LEA evaluation unit had a full-time programmer and one where data tapes were provided by prison inmates. In both these circumstances, unit directors noted these services were budgeted as line items. Unit directors had control over the process and could prioritize their needs, but delivery time was reported to be a problem.

Indeed, the importance of control was addressed by all the respondents, and related to this was the problem of "tying up the main." Due to frequent backups on the mainframes, microcomputers were considered more responsive for timely delivery. A comment from the evaluation unit coordinator of a large district in a southern community is illustrative:

> We sometimes have to do ad hoc reporting. We may get a request from the school board and often we have very little time to respond. We can't submit a request to data processing, get a programmer, and develop a program, etc., and have the report ready. We need access to files all the time on an ad hoc basis.

One respondent from a southwestern LEA evaluation unit explained:

> At one point I was running a lot of data on the mainframe and I was called on the phone by the superintendent. He said that data processing had to do the payroll and asked if I could get off. Well, for the payroll, I certainly could.

Curiously enough, few problems with software or hardware were mentioned by the LEA respondents. The problem of non-integrated statistics was noted, but since most LEA many reports were generated solely with a microcomputer and done entirely within one program, usually Lotus 1-2-3, integrating statistics into the text, was not an issue.

Most of the statistics done on the mainframe were done with SPSS. The results, in most cases, would have to be re-entered at tne microcomputer level. Some LEAs had acquired the recently released microcomputer SPSS-X package and were in the initial phase of learning about its application.

In terms of advantages, the response was uniformly--"we could not do our work without computers." One of the interesting, often noted, consequence of the accuracy and efficiency of computers (especially microcomputers) has been the upgrading of reports. A respondent from a midwestern local education agency commented:

> Staff and board decisions are based on better information. Their decisions are more profound in recent years because of having current data. Before, much of the decision making was gut reaction--seat of the pants--instinct. Now there is an educational process--they are much better informed.

Under these circumstances, it is not surprising tnat many of the LEA evaluation-research units are excited about the opportunities provided by computer application.

Yet one area of commonality with SEAs is the concern over staff development. LEA unit coordinators admitted that tney prefer an laissez-faire system of attaining computer skills. They encouraged their personnel to experiment with a variety of programs in order to find the ones that fit their needs best, but there was no uniform plan for training personnel.

The final area of inquiry dealt with maintenance and future needs. It is interesting that the LEAs, with their more exploratory approach, did not have much of a problem with microcomputer maintenance as one might expect. Some districts had difficulty with manufacture support, but on the whole, the

reports indicated that microcomputers seem to be more reliable than the mainframes. When an entire system like a mainframe was down, the impact was far greater than a single microcomputer going down.

As far as software maintenance, there were virtually no comments about any problems. Certainly, there have been problems with losing data during the initial phase of interfacing, but once the process was working well, there seemed to be few problems with the software or the procedures.

Finally, there was a remarkedly restrained description of future LEA computer needs. Most respondents were satisfied with their current system. They said they wanted more time to work with what they had before acquiring more. About the only improvement suggestions were for more IBM XT, IBM AT at schools in order to develop local school computer networks and telecommunications.

Conclusion

The intent of this research was to conduct a current study of LEA and SEA application, problems, and needs of computer use by evaluation/research units. Some of the observations are as follows.

Models

It appears that computer application by these units at both state and local levels can be described by four models. The "state of the art" model is one in which microcomputers and mainframes are available and the microcomputers can interact with the mainframe.

Use and Effectiveness

Generally, evaluators working in a variety of capacities assist with management decisions in a highly interactive process. Many of their reports go to legislators, school board members, and superintendents. The efficacy of computers is related to the evaluator's need for effective technical analysis and attendance to appropriate political considerations. This characterization is supported by other research (Smith, 1982).

That computers, especially microcomputers, emerged as key elements in such an environment is hardly surprising. The overriding objective of most evaluation-research units is to provide accurate, comprehensive information on testing, management and policy formation. However, in many instances there exists a cleft between 'old' and 'new' administration in the adoption of these technological aids. Many of the interviewees were concerned that their supervisors did not understand the consummate role of computers. Holding to the view that technological innovation is just a passing fad, many of the older administrators are in disagreement with their younger counterparts. Hence, there is a real need for explaining the value of computer technology to a wide audience, especially to the "old guard."

With wider use of computers will come vast changes in communications. Most of the districts and states are preparing for this development. Five evaluation unit directors said they were awaiting an affordable voice synthesizer. Many now have electronic mail. Telecommunications is being explored by virtually every unit in the survey. In effect, each unit is orchestrating further application of computers, particularly in the area of communications.

Yet, despite liberating qualities of technology, there are some major issues for organizational structure and human interaction brought about by increased computer use. As has been noted, staff training is a central concern. The survey results indicate no consensus on this. The alternatives range from

mandated training to ad hoc experience. Other research has indicated that there is an inherent reduction in hierarchical structure when everyone has access to a shared knowledge base (Naisbett, 1982). Consequently, evaluation-research units may experience reduction in bureaucratic structure. Certainly, the desire for more control and more access was keenly articulated by all interviewed.

By having microcomputers, most units will be able to investigate special issues, do the statistics, and develop their own reports. This self-sufficiency may change the nature of evaluation-research units.

Finally, it appears that LEA units are more proactive and innovative than SEA units. Local evaluators seemed to have a better grasp of their role. They understood the larger picture within which they fit. Their orientation was primarily centered on evaluation of district-wide testing programs, and they had the resources to thoroughly study this area. An interesting comment from an East coast LEA staff member summarized this difference:

> We can ask questions that the state level people can't. For instance, I developed a spreadsheet and this information triggered other questions; I mean really new questions. This was an exciting moment for the staff. I don't see the state people getting excited. We are lucky, we can focus; at the state there are so many factors influencing their work that they often have difficulty in focusing in depth on one topic.

Computers will impact evaluation functions. This already occurs at a technological level, but indications are that organizational and social contexts will be modified as well. By examining the nexus between computer application and the context of LEA and SEA evaluation-research units, more relevant evidence can be collected. Evaluators within LEAs and SEAs are using computers and will continue to do so. To improve our understanding of computer application, to identify patterns, and to make more insightful comparisons, continual attention should be devoted to the role of computers by educational evaluation units.

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APPENDIX

Interview Form

Telephone Interview Date_____

Conducted by Merilyn Coe, ROEP

Person contacted_____position_____ LEA,SEA,IND
Size of evaluation unit_____

Topic: Computer Use in Evaluation/Assessment

1. Does your unit use computers: micro yes no
   type_____
2. How often used_____% of time
   main w/ terminal yes no
   main type_____
   terminal type_____
3. Does your unit have dedicated terminals yes no
   purpose_____
   type_____
4. Do the micros interface with the main yes no
5. Has there (is there) been a problem with the interfacing yes no
6. Could the problem be identified as:
   - insufficient software availability
   - software/hardware incompatability
   - time available
   - technical issues- assistance
   - other
7. How has your unit resolved these (this) problem?
8. Tasks : Micro Use or Main Use - and program

W/P	not use	occasionally use	frequently use
Data Base Management			
Statistics			
Spreadsheet			
Graphics			
Telecom			
Instrument Gen			
Other			

What are the three software packages that you use most often?

1._____2._____3._____

9. How have you handled the problem of non-integrated statistical packages?
10. What are some of the salient features of using computers in your work?
11. If you were to upgrade or change your computer system, what would you include?
12. Has there been a problem with maintenance?
13. Other issues?