DOCUMENT RESUME

ED 362 996 EA 025 367

AUTHOR George, Carole A.
TITLE The Development and Evaluation of a User-Friendly Database Describing PA's School Districts. Pennsylvania Educational Policy Studies, Number 13.
INSTITUTION Pittsburgh Univ., Pa. Learning Research and Development Center.
PUB DATE 15 Sep 92
NOTE 32p.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Computer Software Development; Computer Software Evaluation; Database Design; *Database Management Systems; Elementary Secondary Education; *Information Dissemination; *Information Networks; Information Retrieval; Public Schools; School Districts; *User Needs (Information); User Satisfaction (Information)
IDENTIFIERS *Pennsylvania

ABSTRACT

This document describes a study that designed, developed, and evaluated the Pennsylvania school-district database program for use by educational decision makers. The database contains current information developed from data provided by the Pennsylvania Department of Education and describes each of the 500 active school districts in the state. PEP PC was designed to enable easy accessibility of data for viewing and comparing school district information. A preliminary version of PEP PC was tested through a series of user tryouts, conducted at the individual, small group, and site levels. Data were collected through interviews, observations, a user's survey, and users' post-tryout software evaluations. Findings of the user's survey indicate that the microcomputer operating system used by PEP PC, the IBM compatible system, was available to 89 percent of district administrators. The field tests showed that district administrators preferred a microcomputer database program that is user-friendly. The availability of district information can provide the basis for comparing the conditions of school districts and act as a powerful tool for district assessment, planning, and decision making. Three tables and three figures are included. Appendices contain copies of the database evaluation form and user's survey. (LMI)

Pennsylvania Educational Policy Studies

PEPS is a joint effort of the U. of Pittsburgh's School of Education and the Learning Research and Development Center
This is policy paper number 13 in this series

The Development and Evaluation of a User-Friendly Database Describing PA's School Districts

by

Carole A. George

University of Pittsburgh

September 15, 1992

The purpose of this series of papers is to contribute to a more informed debate about critical policy issues facing Pennsylvania's schools. This PEPS series draws upon a data base that has been established here at the University of Pittsburgh under the direction of William Cooley in cooperation with the Pennsylvania Department of Education.

Reactions can be shared:

by mail: LRDC, Pgh., PA 15260
by PittVAX: COOLEY
by FAX: 412-624-9149
by PENN*LINK: PEPS
by phone: 412-624-7085
by INTERNET: COOLEY@VMS.CIS.PiTT.EDU
by chat: room 743, LRDC

Abstract

The purpose of this study was to design, develop, and evaluate the Pennsylvania school district database program for use by educational decisionmakers. The database contains current information developed from data provided by the Pennsylvania Department of Education and describes each of the 500 active school districts in Pennsylvania. PEPS PC was designed to enable easy accessibility of data for viewing and comparing school district information.

This software program was developed within the framework of a formative evaluation study. The project plan was adapted from the Bertram and Childers (1974) model for evaluation of educational products and consisted of the following three components: (a) project planning strategy, (b) design and development strategy, and (c) program diffusion strategy. The emphasis of this study was on design and development through a series of user tryouts.

Using a preliminary version of PEPS PC, the program was tested with a series of one-to-one tryouts, small group tryouts, and on-site tryouts. The system was revised and again tested with user tryouts. Data were collected by evaluator interviews and observations during tryouts, a user's survey of the target population, and a software evaluation form, completed by users after tryouts.

The main result of the user's survey was that the microcomputer operating system used by PEPS PC, the IBM compatible system, was available to 89% of district administrators. The field testing indicated that school district administrators prefer a microcomputer database program that is user friendly and includes: (a) clear prompts and screen displays, (b) frequent use of HELP screens, and (c) relatively quick operation time. The use of options that permit the use of queries and provide a means of comparing districts are desirable.

The availability of easily accessed school district information can provide the foundation for feedback regarding the condition of school districts with respect to other districts and provide district leaders with a powerful tool for district assessment, negotiations, planning, and decision making.

Acknowledgements

The PEPS PC database is a subset of an extensive database established by the Pennsylvania Educational Policy Studies project (PEPS), directed by Dr. William Cooley, in cooperation with the Pennsylvania Department of Education. The purpose of this PC version of the database is to allow users to examine and compare the 500 operating school districts in Pennsylvania. PEPS PC is based on an earlier version created by William Cooley and James Bernauer and has benefitted from the programming assistance of Jamie Schultz. This final project is a result of the support, direction, and assistance of Dr. William Cooley.

The Development and Evaluation of a

User-Friendly Database for Describing PA's School Districts

The public school system has changed greatly in the last several years with respect to public school administration. The number and kinds of educational professionals has increased, teachers' unions have become more powerful, and scarcity of public funds has forced stricter auditing procedures (Cunningham, 1982; Humphries, 1986). The public continues to demand measures of accountability and assurances that the schools are succeeding (Herman & Winters, 1989). As the participants in the school system increase, the school superintendent's job becomes more and more complex (Humphries, 1986). The superintendent must be able to communicate the condition of the schools to others, and through dialogue with participants, must be able to learn about what is happening in the schools and throughout the school district.

Richard Wallace, (1985) former superintendent of Pittsburgh Public Schools, emphasizes the importance of information for educational leaders by saying "The first step in providing instructional leadership is to gain an understanding of the present state of the district. It is imperative that the superintendent analyze all relevant data at his/her disposal that might provide insights about the current functioning of schools in the district" (p. 9).

This is not a simple task for today's educational administrator. The amount of information generated by educational organizations today has dramatically increased over the past several years (Burbach, 1989). Public schools, themselves, generate an enormous amount of data. They have student and personnel data, achievement data from local and state tests, and fiscal data for budgeting and accounting to name just

a portion. In addition, local, state, and federal governments and private agencies are collecting data relevant to education (Burstein, 1984). The way schools access and use these data can affect administrative decisionmaking (Rhodes, 1988).

The purpose of this study was to provide a means to access and browse information describing Pennsylvania's public school districts. This school district database was developed as a user-friendly, microcomputer system targeted for use by educational policymakers and decisionmakers for the purpose of providing a timely and relevant database to help support planning and decisionmaking. The use of a user-friendly, microcomputer system to access this database can provide a means to (a) quickly obtain useful data, (b) share information across different levels of the organization, and (c) use data to support decisions for planning and management (Cooley, 1990; Crawford, 1988; & Turbin, Gisher, & Altman, 1988). By providing a relevant and easily accessed database, and presenting information in a form that decisionmakers understand, information is more likely to be useful and used (Cooley, 1983; Schellenberg, 1985). The use of relevant data that are timely and easily obtained can improve the decisionmaking and planning process, provide the opportunity to consider alternatives, and aid in the management of resources (Cunningham, 1982; Turbin et al., 1988). This paper will describe the development and evaluation of this database application.

Program Description

The PEPS PC school district database was developed in the context of the Pennsylvania Educational Policy Studies Project (PEPS) directed by Dr. William W. Cooley and located at the Learning Research and Development Center at the University of Pittsburgh. An objective of the PEPS Project is to support the efforts of policymakers and school district administrators by providing a means of accessing relevant information that could support decisionmaking (Cooley, 1992). This

Pennsylvania school district database was developed as one way to achieve this objective.

The design was based on an earlier version developed by William Cooley and James Bernauer. This current system, PEPS PC, is a stand-alone application designed for use on a DOS based, IBM compatible microcomputer system. This system is a menu-driven, user-friendly, microcomputer application designed to provide a means of selecting and manipulating the data so that school districts can be compared to other districts that are similar. The intent was not to interpret these data, but to display descriptive information that is relevant to educational policymaking and decisionmaking, and in a form that is easily understood. The following are a few examples of the way it may be used. School districts may be compared on the basis of their:

a) instructional expenditures with other districts having similar available local revenue.

b) student test results with other districts with a similar enrollment and student population.

c) professional personnel salaries with other districts that are similar.

The database used in this system was developed from data provided by the Pennsylvania Department of Education (PDE) to the PEPS Project. This file contains data collected for operational purposes by the various bureaus of the Department of Education (Cooley, 1990). A small part of these data is used to create the PEPS PC database which describes Pennsylvania public school districts. Although the information in the database will always be at least one year behind, Cooley (1990) reports that variations in ranking and comparisons between school districts remain relatively constant across years. This means, that despite the change in total values,

the relativity of the values remains stable, thus the database can remain useful as a means of comparing school districts.

The database includes 128 variables that describe school districts. These variables are grouped as: (a) identification, (b) student, (c) revenues, (d) expenditures, and (e) professional personnel. The identification variables relate to location, population density, as well as other identifying information. The student variables are derived from the results of the TELLS test, a state mandated test administered in the spring of every school year in grades three, five, and eight in every school district in Pennsylvania (Hertzog, Masters, Miller, Simanovich, & Skiffington, 1985). The professional personnel variables are grouped by positions and include administrators, coordinators, and classroom teachers. Student and professional personnel data are summarized for each district.

The financial variables include both revenues and expenditures and are derived from budget reports submitted by each school district to the PDE. These variables are displayed as a total amount, as a per pupil amount, and as a percent of total amount. The system was designed to include descriptors in as many different areas as possible, and at the same time limit the size of the database so it can be easily viewed and manipulated on a personal computer.

One way the system displays the information is on four different screen formats: Student, Revenue, Expense, and Professional Personnel as illustrated in Figure 1. One set of four profile screens describes each of the 500 school districts. Each profile includes a HELP screen that provides variable definitions. Viewing time is controlled by the user

PA

ENROLLMENT (ADM) 3,271 PCT SPEC ED 7% PCT APDC 8%

	NUMBER TESTED	PERCENT NONWHITE	% CHAPTER 1 READ	% CHAPTER 1 MATH	% BELOW CUTSCORE READ	% BELOW CUTSCORE MATH
GRADE 3	249	5%	16%	6%	15%	14%
GRADE 5	237	5%	14%	6%	18%	14%
GRADE 8	226	5%	8%	4%	17%	15%

Number Students Per Administrator	318
Number Students Per Teacher	18
Number Students Per Professional Personnel	15

Figure 1. Student Profile, Average PA District

permitting movement back and forth between the four profile screens and to move between districts. In addition to the school district profiles, a set of state summary profiles is included. Values displayed on the Pennsylvania screens are the average of all Pennsylvania districts.

The options are presented in a popup menu displayed on the first screen of the main program as displayed in Figure 2. The options were selected to enable the user the opportunity to browse the profile screens and easily compare one district's information with others that are similar. In addition, options were designed to be easy to use and would enable information to be retrieved and displayed quickly, therefore simplicity of design was a priority.

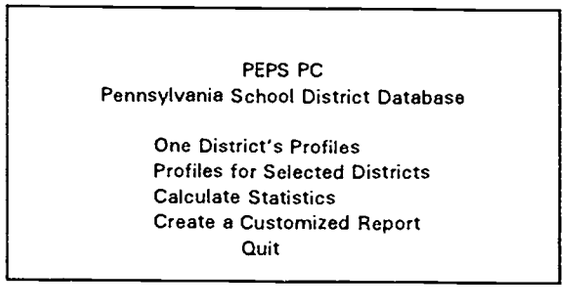


Figure 2. Main Menu, PEPS PC

Selecting option one, "One District's Profiles", users can search for one specific school district and view that district's profile screens and also browse the profile screens of other or all school districts. By selecting the order in which districts are displayed, users can compare districts that are similar. Districts can be ordered by: (a) school district name, (b) intermediate unit, (c) total expenses per pupil, (d) state aid ratio, (e) percent AFDC students, and (f) enrollment.

Using options two, three, and four users can select districts sharing common characteristics. Using (a) "Profiles for Selected Districts", users view the profile screens of the districts that are similar; (b) "Calculate Statistics", users can calculate statistics on a specific field for selected or all districts; and (c) "Create a Report", users can list information in several fields for selected school districts.

Project Plan

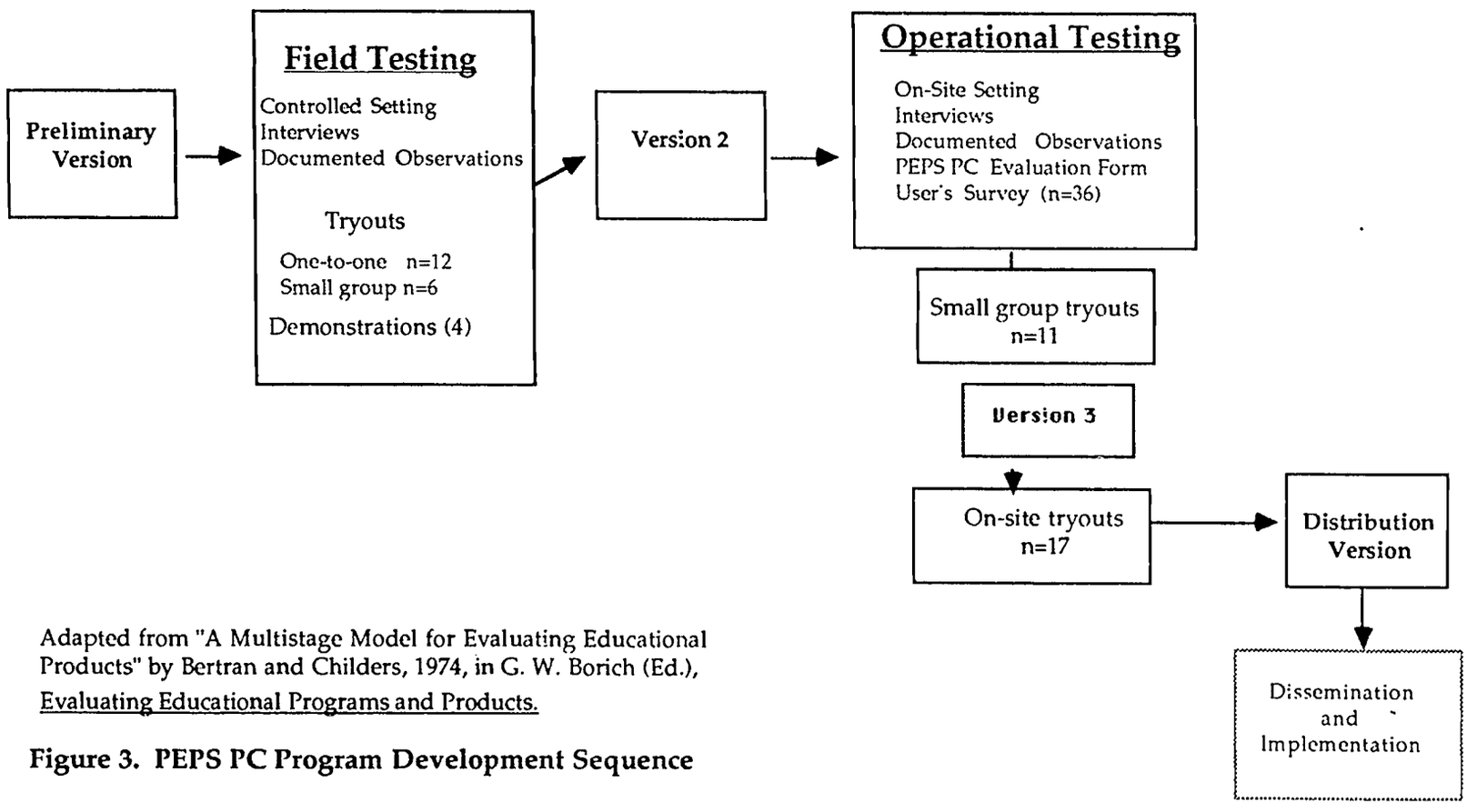
This software system was developed within the framework of a formative evaluation (George, 1992). It was targeted for use by Pennsylvania public school district administrators, though a broader population of potential users was also defined and included: (a) local and state government officials, (b) school district personnel, (c) community members, and (d) business representatives.

The project plan was adapted from the Bertram and Childers (1974) model for evaluation of educational products. The major emphasis was on program development with a series of one-to-one tryouts, small group tryouts, and demonstrations. The system was first tested in a controlled setting and then operationally tested in an on-site setting. After each series of tryouts, the system was revised. Figure 3 illustrates the development sequence.

Information was collected by interviewing and observing users during tryouts and demonstrations. In addition, on-site users completed a software evaluation questionnaire presented in Appendix A. The questionnaire was adapted from the Microcomputer Testing Software Review Form (Hsu & Nitko, 1983) developed for evaluating classroom testing software. Also consulted were the User's Evaluation Form (Hsu & Saddock, 1985), and forms suggested in Lawson's (1974) *Formative Instructional Product Evaluation*. The questionnaire generated information relative to users' (a) microcomputer and information use; (b) evaluation of PEPS PC options and the types of information included; and (c) ratings of installation, performance, content, screen display and format, documentation, and overall evaluation. Open-ended items provided an opportunity for suggestions and comments.

In addition to information generated during tryouts, data describing the target population with respect to microcomputer use and information needs was generated using a survey of the targeted population, presented in Appendix B. This mailing was

Program Development Sequence



Adapted from "A Multistage Model for Evaluating Educational Products" by Bertran and Childers, 1974, in G. W. Borich (Ed.), Evaluating Educational Programs and Products.

Figure 3. PEPS PC Program Development Sequence

sent to fifty-four Pennsylvania public school district leaders. This group included fifty-two school district superintendents, and two intermediate unit directors. This sample group was selected systematically with a random start drawn from the population of school district superintendents and intermediate unit directors. The sample population was first ordered by zip code, therefore stratifying geographically; selection of a starting point was random; and every 10th record was selected. This generated a 10% sample. A total of 36 administrators responded to the survey, 67% of the original sample. The following is a description of the development sequence.

Program Development

A preliminary version of PEPS PC was developed based on an earlier version developed by William Cooley and James Bernauer, interviews with the project director, William Cooley, and a review of the professional literature. A major goal for this version was to create an application that was user-friendly. When PEPS PC version 1 was running smoothly, the system was field tested with a series of one-to-one and small group tryouts, demonstrations, and on-site tryouts in a controlled setting. The users were volunteers from the target population and population of potential users.

One-to-one tryouts included eleven users, two public school district superintendents, five school district administrators, one legislative staff member from the House Education committee, three professors and one student from the Administrative and Policy Studies department. Each session took approximately forty-five minutes. The evaluator first demonstrated how to use the various options available, then observed and documented the users operation of the system.

Small group tryouts were similar except that one group of six students from a dBASE IV class were observed by the evaluator. This version of PEPS PC was also demonstrated four times involving approximately thirty-four potential users. These tryouts and demonstrations were observed and documented by an evaluator.

In addition, seven users operated the system on their personal computers either in their homes or at their workplace. This group included two school district superintendents and five school district administrators. All of the users had previously participated in one-to-one tryouts of the system. Feedback was collected using phone interviews.

Though no major problems were noted in the program's performance and content this first series of field testing indicated the need to make the system easier to use, include additional types of information, and improve clarity of the screen displays and documentation. The most valuable feedback was generated by the on-site tryouts. The preliminary version of PEPS PC was written using the dBASE IV application and dependent on the dBASE IV application to run. As a result, on-site users had numerous problems trying to install and run the program. In addition, use of the program was severely limited due to the need for users to have the dBASE IV application. These problems indicated the need to recreate the program using an application that would produce a stand-alone version of PEPS PC and enable operation of the program without the need to own any additional software. This was done using Clipper 5.0 application, developed by the Nantucket Corporation (1990). Using the Clipper compiler, executable files were created resulting in a stand-alone version. This version was used in the next series of tryouts.

When the system was revised, it was again tested using PEPS PC version 2. These tryouts differed from the field testing in two ways. First, during this stage an attempt was made to approximate the actual conditions in which this system will eventually be used. To do this, the evaluator conducted tryouts giving little or no assistance and also conducted on-site tryouts. Second, in addition to evaluator observations, a software evaluation questionnaire was completed by users. This questionnaire was described in the previous section.

The first series of tryouts were with a small group as in the field testing stage, except that this time they were given little help. Users were eleven students in a dBASE IV class. After some minor revisions, the system, PEPS PC version 3, was tested with on-site tryouts by seventeen users. This group included twelve school district administrators, two computer information experts, and one faculty member and two students from the school of education. The group of school district administrators was selected based on their response to Item 7 in the user's survey that asked if they were interested in trying out the PEPS PC school district database. The five other on-site users were volunteers.

This group of on-site users was given no preliminary help. They were sent the PEPS PC database, the user's guide, the evaluation questionnaire, and instructions. The users were asked to operate the system for approximately three weeks and complete and return the questionnaire. The results of the user's survey and tryouts are described in the following section.

Results

The results of the informational survey of the target population are summarized in Table 1. Most significantly, all respondents had access to a microcomputer system, and the microcomputer system available to 89% of the respondents was the IBM compatible system, the type necessary for operating the PEPS PC database system. A considerable number had easy access to a computer (75%, computer in their offices) and were frequent users, using the microcomputer for administrative purposes either daily or weekly (75%). Over 53% reported using the computer daily. The most frequently used administrative applications were spreadsheet and word processing (86%, 86%), database (69%), communications (64%), and graphics (56%). The least frequently used type of software was data analysis (33%).

A vast majority of the respondents (81%) indicated an interest in using Pennsylvania school district information, most frequently for district assessment, budgeting, and contract negotiations (69%). Other reasons included, communicating with school board, the public, and teachers (53%, 53%, 39%). The results provided realistic guidelines for planning and development.

The results of the tryouts and demonstrations provided constructive feedback regarding development of microcomputer applications. Overall users responses were extremely positive. They indicated a preference for a microcomputer database system that is user-friendly, which includes the following: (a) clearly written prompts, directions, and messages frequently displayed; (b) screen displays that are clear, simple, and easy to read and interpret; (c) frequent use of HELP screens that include descriptions of the options, directions for using them, and examples; (d) options that are menu-driven; and (e) documentation that includes clearly written directions and descriptions and numerous examples.

Results indicated that errors were more frequent when the user was required to type in entries. Users also became impatient with a slow system and became frustrated if they wanted to exit before completing the option. Therefore, it was recommended to (a) have a relatively quick operation time; (b) use a picklist for selection of variables and options to make the operation easier, and reduce errors; and (c) provide an option to exit the screen display and return to the main menu to help to eliminate frustration. Training sessions, inservice, or tutorials may be necessary to encourage usage and limit frustrations.

The on-site users' evaluation of the PEPS PC system was overwhelming positive as indicated by their responses on the evaluation form. Users were asked to indicate the value of the options and the information, as well as to evaluate the installation procedure, performance, content, screen display and format,

Table 1. User's Survey: Summary of Results

Respondents n = 36

Position	Freq	%	Total	Freq	%
Superintendent	16	44%	Male	33	92%
Assistant Superintendent	5	14%	Female	3	8%
Business Manager	5	14%			
Coordinator	5	14%	TOTAL	36	
Principal	3	8%			
Other	2	6%			
TOTAL	36				

Microcomputer System

Location	Freq	%	Description	Freq	%
Office	27	75%	IBM Compatible	32	89%
Central Office	22	61%	Apple	7	19%
District	13	36%	Macintosh	13	36%
			Color Monitor	22	61%
Microcomputer Use	Freq	%	Mono Monitor	11	31%
Daily	19	53%	Hard disk drive	27	75%
Weekly	8	22%	Floppy (3 1/2")	21	58%
Monthly	-	-	Floppy (5 1/4")	13	36%
Other	7	19%	Printer	28	78%
Missing	2	6%			

Application Software

Own Admin Use	Freq	%	Staff Admin Use	Freq	%
Database	25	69%	Database	29	81%
Spreadsheet	31	86%	Spreadsheet	29	81%
Word processing	31	86%	Word Processing	35	97%
Graphics	20	56%	Graphics	22	61%
Data analysis	12	33%	Data analysis	16	44%
Communications	23	64%	Communications	23	64%
Other	-	-	Other	3	8%

Pennsylvania School District Information Use

Reasons for Use	Freq	%
District assessment	25	69%
Budgeting	25	69%
Contract negotiation	25	69%
Communicate/teachers	14	39%
Communicate/sch board	19	53%
Communicate/public	19	53%
Don't know	9	25%
Other	3	8%

Interest in Peps PC Tryout

	Freq	%
Yes	14	39%
Maybe	13	36%
No	6	17%

documentation and overall value. Of the seventeen on-site users, the majority (13) indicated that they used a microcomputer daily. On the average, they reported that the number of times they operated the PEPS PC system was approximately 2.6 times for a total accumulated time of two and one-half hours.

The value of the options and information was determined based on a four point scale (1 = never useful, 2 = seldom useful, 3 = occasionally useful, and 4 = frequently useful). The results are summarized in Table 2. Users indicated that all four options were at least occasionally useful (means over 3.3), though, Options 1 and 2, One District's Profiles and Profiles for Selected Districts, were rated most frequently useful (mean = 3.9). Though all of the information was rated as at least occasionally useful, the revenue and expenditure information was rated most frequently useful (mean = 3.9, 3.7). The coordinator information was considered least useful (mean = 2.7), but because this information was a subset of the professional personnel information and, therefore, affected the district values, it was decided to continue to include these data.

Table 2. **PEPS PC Evaluation Form: Summary of Options and Information**

Options	**Mean**
One District's Profiles	3.9
Profiles for Selected Districts	3.9
Calculate Statistics	3.3
Create a Customized Report	3.4
Information	**Mean**
Student Information	3.5
Administrator Information	3.4
Coordinator Information	2.7
Teacher Information	3.4
Expenditure Information	3.9
Revenue Information	3.7
Identification Information	3.3
n = 17	Rating Scale 1-4

The remaining items of the evaluation form were rated on a five point scale with a five equal to strongly agree, the most favorable response. These are summarized in Table 3. Items that were stated negatively were recoded so that a five represented the most favorable response. Because most of the users (76%) indicated that they used the microcomputer daily, and therefore, were experienced computer users, the responses were interpreted cautiously. It is likely that potential users will be less experienced with respect to computer use (George, 1992). Therefore, they may experience more problems, consequently, any problems reported, even if by a few, were considered seriously and indicated possible revisions.

All users indicated that the installation procedure was easy to follow and error-free. Users' responses indicated that the system ran smoothly, directions were clear, sequence was logical, output alternatives were sufficient, and the system had few errors. Possible areas to be considered for revision related to training and to the availability of escape options. Six respondents felt that additional training would be necessary to operate the system effectively, it is likely that less experienced users would have even more problems. Therefore, planning additional training or inservice demonstrations was considered and recommended. Two respondents indicated the need for additional escape options. It is possible that these users were unaware that the escape key could be used at any time to exit. Further screen directions may be necessary. Another consideration is that using the escape key to abort is not sufficient. Including options to repeat and edit previous steps, especially when creating criteria, may be necessary.

All users agreed that the information included was accurate, easy to interpret, and valuable for school district leaders; and that the screen displays were clear, easy to read, and the language was appropriate. They indicated that the guide was complete, logically organized, and easy to use. Four responses to item 48 indicated

the need for additional examples to illustrate how to effectively use the system. Again, because these responses were from experienced computer users, the use of additional examples may be helpful in a future version. Users indicated that the system was an excellent tool for district level use and strongly recommended its use.

Some respondents felt that the information was not current (the tested version included 1989-90 data and was tested in 1991). The information is obtained from the Pennsylvania Department of Education, and will always be at least one year behind. Because this database is presented as a means for school districts to view and compare their district with others in the state, the apparent problem about currency of data may not be substantial. Cooley (1990) reports that variations in ranking and comparisons between school districts remain relatively constant across years. This would mean, that despite the change in total values the relativity of the values remains stable. In addition, the database will be updated annually. Though the currency of the data can not be changed, revising the documentation to include an explanation of the stability of the comparisons and rankings, as well as information about the plans for annual updates may be beneficial.

The evaluation form also included four open-ended items. These items gave users the opportunity to include comments or suggestions for revisions and to indicate elements that caused frustration. Many of the responses were positive and included the following:

> I have shared this database with other administrators of our district and they are very positive about it.
>
> The program is very impressive.
>
> In response to a board member's statement that this district had the highest number of administrators per pupil, I was able check using this system and show there was no truth to that statement.
>
> It is . . . an excellent, quick way to compare districts-statewide. This is most useful at negotiation time.

Table 3. Operational Testing: Summary of PEPS PC Evaluation Form

On-site testing: n = 17

Program Performance	
Items	Rating Mean
Program runs smoothly	4.6
Directions, clearly stated	4.5
Error handling, sufficient	3.8
Program sequence, logical	4.3
Additional training, not necessary	3.3
Information, retrieved quickly	4.2
Output alternatives, sufficient	3.8
Escape options, sufficient	4.1
Program operation, not time-consuming	4.2
Add 'HELP' screens; not necessary	3.2
Program Content	
Information is accurate	4.2
Information is current	3.9
Information is easy to interpret	4.2
Information is valuable for admin. use	4.5
Screen Display, Format	
Displays are clear, easy to read	4.4
Language is appropriate	4.3
Displays, not confusing	4.2
Displays, free of errors	4.3
User's Guide	
Guide includes essential information	4.4
Dictionary describes variables clearly	4.0
Guide is logically organized	4.2
Information is located easily	4.2
No additional examples necessary	3.0
Overall Evaluation	
PEPS PC is an excellent tool for admin.	4.5
PEPS PC is highly recommended	4.6
PEPS PC needs no revisions	3.1

Users	Freq
Supt, Director	2
District Admin	9
Other	6
Total n	17
Freq PC Use	Freq
Daily	13
Weekly	3
Other	1
PEPS PC Use	Mean
Number of Times	2.6
Hours	2.5
Information Use	Freq
District Assess.	13
Budget	9
Negotiations	6
Communicate with:	
Prof. Personnel	7
School Board	9
Public	8

Rating
5 = Strongly Agree
4 = Agree
3 = Neutral
2 = Disagree
1 = Strongly Disagree

Other users' responses provided valuable feedback with respect to system revisions. Some of the suggestions indicated the following additions: (a) options to revise search criteria, (b) additional escape options, (c) better error handling procedure, (d) additional information, (e) trends over time, and (f) options to edit criteria previously defined. These suggestions will be considered for future versions.

These results were considered with respect to plans for revisions and for future development. Time constraints and funding limited the revisions to only those determined absolutely necessary to include in the distribution version that was be used in dissemination. Other revisions will be considered for future versions. Revisions, therefore, were limited to improving clarity of screen displays and improving and revising the documentation. When these revisions were completed, the distribution version was ready for dissemination.

Based on the results of the survey of the targeted population (district leaders and administrators) that indicated that over 75% of those responding were either definitely or possibly interested in using the PEPS PC microcomputer system and approximately 89% of the districts had the necessary hardware, the dissemination took place in two phases. PEPS PC was first made available to a sample of the targeted population. Plans for future dissemination will be based on results of the earlier phase.

Summary and Conclusion

The purpose of this study was to design, develop, and evaluate a microcomputer database system within the framework of a formative evaluation. The school district database was targeted for use by public school district administrators. It is argued that timely, relevant, and easily accessed information can help support district level decisionmaking (Cooley, 1990; Crawford, 1985; Cunningham, 1982; Turbin, Gisher, & Altman, 1988). In an attempt to meet these needs, this database

contains current information that is descriptive of the 500 school districts in Pennsylvania and describes students, professional personnel, and financial operations. It was designed to be user-friendly, with options to browse, search, define queries, calculate simple statistics, and create a custom report.

The model selected for this formative evaluation was the Bertram and Childers model (1974). The model was adapted to meet the specific needs of software development and emphasized development within a series of field testing. The design and development strategy was the emphasis of this study and required the major portion of the time. This component included field testing and operational testing stages. During tryouts, the evaluator recorded problems, comments, and suggestions of the users. Testing included tryouts in a controlled situation and also included on-site tryouts. As an additional means of collecting feedback, the operational testing included completion of a software evaluation questionnaire. Revisions were based on feedback. This process continued until completion of a distribution version. The PEPS PC statewide distribution will be based on the results of the first phase of the dissemination.

The model was particularly well suited to this project. Because the system was a microcomputer application, data collection activities focused on user tryouts. By observing and documenting usage, the evaluator was able to note problems associated with the hardware as well as those with the application. In addition, the on-site tryouts generated information regarding performance relative to the actual use.

The evaluator felt that the part of this study that produced the most useful information was the field testing with one-to-one and small group tryouts using evaluator interviews and documented observations. This stage was most valuable for two reasons. First, the users included both experienced and inexperienced computer

users. Second, the evaluator was able to learn a great deal about the operating problems by observing the user and responding to his/her questions.

During on-site tryouts, the method of selection of the users and the types of data collection activities designed were somewhat different from the earlier field testing tryouts and therefore limited the feedback generated. Because the sample group in the operational testing was selected from district administrators who volunteered, the sample group consisted of experienced computer users, therefore, the results had to be interpreted cautiously. In addition, data were collected using the PEPS PC evaluation questionnaire. Responses were, therefore, limited by the items on the form. Though the evaluator felt that the operational testing was a useful and necessary part of this study, generating information with respect to application use on many and different computers and without the aid of an evaluator, it may have been more useful if data collection activities had included documented observations and/or interviews in addition to the users' responses on the evaluation form.

Providing school district data in a form that includes a means of comparing districts and in an easily accessed database can have implications for school district administrators and decisionmakers as well as community members, educators, and outside participants. The availability of easily accessed school district information can provide school district administrators with the foundation for feedback regarding the condition of the schools and the school district with respect to other districts. The availability of a relevant database can provide the district administrators with a powerful tool for district assessment, negotiations, planning and decisionmaking. In addition, the same information can provide the means for participants outside of the school district to learn of the condition of the school district with respect to other districts. It can also provide outside participants with an overview of how the school districts are performing. Making information open and available may raise questions

and/or stimulate debate. The consequences of providing this information to participants within the school district, as well as those who are outside, can be explored in further study as the database becomes more widely used.

The possibilities for future research are exciting. With respect to software development, the database can be considered a work in progress. Feedback from users can continue to be used to refine this database. In addition, feedback from district administrators can provide indicators regarding how and what information is desirable. Observing the consequences of making such information available to the public can also provide valuable feedback describing how information can effect change in the public school district. In summary, this study provides a basis for learning about how information impacts school districts and the way they operate.

APPENDIX A

User's Survey

PEPS PC Pennsylvania School District Database

Name_____Position_____

Work Address_____

_____Phone_____

Microcomputer and Information Usage (Check all relevant items)

1. Do you have access to a microcomputer

_____In your office?
_____In the central office?
_____Elsewhere in the district?
_____None available?

2. Describe the microcomputer system that you use or is available for your use.

_____IBM compatible microcomputer
_____Apple microcomputer
_____Macintosh system
_____Color monitor
_____Mono monitor
_____Hard disk drive
_____Floppy diskette (3 1/2")
_____Floppy diskette (5 1/4")
_____Printer
_____Other (specify)_____

3. How often do you personally use the microcomputer?

Daily Weekly Monthly Other (specify)_____

4. Please check the types of applications software used in your district.

Personal Use	Staff Use
____Database	____Database
____Spreadsheet	____Spreadsheet
____Word processing	____Word processing
____Graphics	____Graphics
____Data analysis	____Data analysis
____Communications	____Communications
____Other (specify)_____	____Other (specify)_____

5. Please indicate the extent to which you might use information describing other Pennsylvania school districts (as would be available with the PEPS PC database described previously), if it were available.

Daily Weekly Monthly Don't Know

6. How might you use Pennsylvania school district information?

_____District assessment
_____Budgeting
_____Contract negotiations
_____Communicating with teachers
_____Communicating with school board members
_____Communicating with public
_____Don't know
_____Other (describe)_____

PEPS PC School District Database

7. Would you be interested in trying out the PEPS PC Pennsylvania School District Database (at your location)?

_____Yes, I would like to try out the system using my microcomputer.
_____I may be interested, first I would like to learn more about it.
_____No, I am not interested in trying out the system.

APPENDIX B

PEPS PC Evaluation Form

PEPS PC Pennsylvania School District Database

Name _____ Position _____

Part One DIRECTIONS: Please complete this form. Most items require only a check mark ( ). Some may require more than one response. If the item is not applicable, leave it blank.

1. How often do you personally use the microcomputer?

___Daily ___Weekly ___Monthly ___Other (specify)_____

How often have you personally used the PEPS PC Pennsylvania School District Database during the last month (or _____weeks)?

2. Number of Times

_____One to two times
_____Three to four times
_____Five to seven times
_____Eight to ten times
_____More than ten times

3. Total Amount of Time

_____Less than one hour
_____One hour to two hours
_____Two hours to three hours
_____Three hours to four hours
_____More than four hours

Now that you have had a chance to use PEPS PC, how do you expect to use Pennsylvania school district information? (Check all relevant items)

4._____District assessment
5._____Budgeting
6._____Contract negotiations
7._____Communicating with district personnel
8._____Communicating with school board members
9._____Communicating with public
10._____Other (describe)_____

Part Two DIRECTIONS: Indicate the usefulness of the options and information included in the PEPS PC system by circling the appropriate numeral.

4=Frequently Useful
3=Occasionally Useful
2=Seldom Useful
1=Never Useful

When using the PEPS PC Pennsylvania School District Database, how useful were the following options?

	Freq. Useful	Occas. Useful	Seldom Useful	Never Useful
11. One District's Profiles	4	3	2	1
12. Profiles for Selected Districts	4	3	2	1
13. Calculate Statistics	4	3	2	1
14. Create a Customized Report	4	3	2	1

When using the PEPS PC Pennsylvania School District Database, how useful were the following kinds of information?

	Freq. Useful	Occas. Useful	Seldom Useful	Never Useful
15. Student information	4	3	2	1
16. Administrator information	4	3	2	1
17. Coordinator information	4	3	2	1
18. Teacher information	4	3	2	1
19. Expenditure information	4	3	2	1
20. Revenue variables	4	3	2	1
21. Identification variables	4	3	2	1

22. What additional options or kinds of information would you find useful?

Part 3: PEPS PC Pennsylvania School District Database Evaluation

DIRECTIONS: Read each statement and decide the extent to which you agree or disagree. Circle the appropriate numeral to indicate your response.

5=Strongly Agree (SA)
4=Agree (A)
3=Neutral (N)
2=Disagree (D)
1=Strongly Disagree (SD)

Installation	SA	A	N	D	SD
23. The installation procedure was easy to follow.	5	4	3	2	1
24. Installation was error-free.	5	4	3	2	1
25. Installing the program required additional help.	5	4	3	2	1

Program Performance	SA	A	N	D	SD
26. The program runs smoothly with few errors.	5	4	3	2	1
27. The directions are clearly stated.	5	4	3	2	1
28. The error handling procedure is sufficient.	5	4	3	2	1
29. The program sequence is logical.	5	4	3	2	1
30. Additional training is necessary to use the program effectively.	5	4	3	2	1
31. Information is retrieved and displayed quickly.	5	4	3	2	1
32. Output alternatives are sufficient.	5	4	3	2	1
33. The program has sufficient "Escape" options to permit exit at any time.	5	4	3	2	1
34. Operating the program is time-consuming and tedious.	5	4	3	2	1
35. Additional "Help" screens are necessary in order to operate the program effectively.	5	4	3	2	1

Program Content	SA	A	N	D	SD
36. The information is accurate.	5	4	3	2	1
37. The information is reasonably current.	5	4	3	2	1
38. The information is presented in a form that is easy to interpret.	5	4	3	2	1
39. The information has little value for school district leaders.	5	4	3	2	1

Screen Display and Format	SA	A	N	D	B
40. Screen displays are clear and easy to read.	5	4	3	2	1
41. The language used is appropriate.	5	4	3	2	1
42. Screen displays contain too much confusing or extraneous information.	5	4	3	2	1
43. Screen displays are free from grammatical, spelling, or typographical errors.	5	4	3	2	1

User's Guide	SA	A	N	D	B
44. The User's Guide includes essential information needed to use the program effectively.	5	4	3	2	1
45. The database dictionary describes variables clearly and completely.	5	4	3	2	1
46. The User's Guide is logically organized.	5	4	3	2	1
47. The information is located easily.	5	4	3	2	1
48. Additional examples are necessary to illustrate how the program can be most effectively used.	5	4	3	2	1

Overall Evaluation	SA	A	N	D	B
49. PEPS PC system is an excellent tool for district level decision making and planning.	5	4	3	2	1
50. PEPS PC system is highly recommended.	5	4	3	2	1
51. The PEPS PC system requires additional revisions.	5	4	3	2	1

52. Please indicate ways to improve the operation or usefulness of this system.

_____

_____

_____

53. What additional indexes (order options) would you find useful?

_____

_____

54. Please indicate elements of the system that caused frustration.

_____

_____

_____

Bibliography

Bertram, C. L., & Childers, R. D. (1974). A multistage model for evaluating educational products. In G. D. Borich (Ed.), Evaluating educational programs and products (pp. 186-209). Englewood Cliffs, NJ: Educational Technology Publications.

Burbach, H. J. (1989). A new role for a new age: The need for an assistant superintendent for information management. Educational Technology, 29(9), 21-25.

Burstein, L. (1984). The use of existing data bases in program evaluation and school improvement. Educational Evaluation and Policy Analysis, 7(2). 307-318.

Cooley, W. W. (1992). Pennsylvania Educational Policy Studies, Newsletter 1. University of Pittsburgh, Pennsylvania Educational Policy Studies, Pittsburgh.

Cooley, W. W. (1990). Confidentiality of education data and data access. University of Pittsburgh, Pennsylvania Educational Policy Studies, Pittsburgh.

Cooley, W. W. (1990). Important variations among Pennsylvania school districts. University of Pittsburgh, Pennsylvania Educational Policy Studies, Pittsburgh.

Cooley, W. W. (1983). Improving the performance of an educational system. Educational Researcher, 12(6), 4-12.

Crawford, C. W. (1985). Administrative uses of microcomputers, part II: Specific tasks. NAASP Bulletin, 69, 53-60.

Cunningham, W. G. (1982). Systematic planning for educational change. Mountain View, CA: Mayfield.

George, C. A. (1992). The application of formative evaluation in the development of a database program for school district administrators. Doctoral dissertation, University of Pittsburgh, Pittsburgh.

Herman, J. L., & Winters, L. (1989). Reporting for effective decisionmaking. (Report No. TM 013 242). San Francisco, CA. (ERIC Document Reproduction Service No. ED 306 307).

Hertzog, J. F., Masters, J. R., Miller, L. R., Simanovich, R. J., & Skiffington, E. W. (1985). TELLS: Testing for essential learning and literacy skills. Summary of results 1984. Turning the tide, an agenda for excellence in the Pennsylvania public schools. (Report No. TM 860 141). Harrisburg, PA: Pennsylvania Department of Education. (ERIC Document No. ED 266 191).

Hsu, T. C., & Nitko, A. J. (1983). Microcomputer testing software teachers can use. Educational Measurement: Issues and Practice, Winter, 15-30.

Hsu, T. C., & Saddock, S. F. (1985). Computer-assisted test construction: A state of the art. (Report No. TM88). Princeton, N.J.: Educational Testing Service. (ERIC Document Reproduction Service)

Humphries, J. W. (1986). Who's in charge here? College Board Review, (139), 10-11, 31-32.

Lawson, T. E. (1974). Formative instructional product evaluation. Englewood Cliffs, NJ: Educational Technology Publications.

Rhodes, L. A. (1988). Technology as a leadership tool. Brainard, MN. (ERIC Document Reproduction Service No. ED 305 193).

Schellenberg, S. J. (1985). Databases and the professional evaluator. San Francisco, CA. (ERIC Document Reproduction Service No. ED 277 109).

Turban, E., Gisher, J. C., & Altman, S. (1988). Decision support systems in academic administration. The Journal of Educational Administration, 26(1), 97-113.

Wallace, R. C., Jr. (1985). The superintendent of education: Data based instructional leadership. Pittsburgh, PA: University of Pittsburgh, Learning Research and Development Center. (ERIC Document No. ED 256 060).