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ABSTRACT

The purpose of the Pyramid Technology Training (PTT) program was to improve teaching, learning, and school staff productivity in the Fairfax County Public Schools (Virginia). Each of 23 technology training specialists served a school pyramid and other schools in an administrative area, providing technology training, technical support, advice,and referral to other technology resources, with an emphasis on training. During the 1995-1996 school year, the Office of Program Evaluation assessed the implementation and effectiveness of PTT. The report concluded that PTT has functioned effectively over the past two years as a comprehensive and adaptive, in-school technology training and technical support program. Data demonstrate that the program has met the diverse needs of school staff, and produced practical benefits for teachers, increasing their use of technology. In addition, the data suggest that students may have increased the frequency or effectiveness of their use of technology as a result of teacher training or in-class modeling by a specialist. Two recommendations are supported by the results of the evaluation. Administrators should seek ways of: (1) increasing the availability of teachers for training and their participation in training, especially at the secondary level; and (2) reducing schools' use of the specialists to provide non-training services--technical support, advising and referral. Supporting documents are appended. (AEF)

Evaluation of

Pyramid Technology Training:

Final Report

Fairfax County Public Schools
Office of Program Evaluation

November 1996

FAIRFAX COUNTY PUBLIC SCHOOLS
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EVALUATION OF PYRAMID TECHNOLOGY TRAINING: FINAL REPORT

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EVALUATION OF PYRAMID TECHNOLOGY TRAINING: FINAL REPORT

EXECUTIVE SUMMARY

Background

Pyramid Technology Training (PTT) completed its second year in the summer of 1996. The purpose of the program was to improve teaching, learning, and school staff productivity in the Fairfax County Public Schools. To accomplish this purpose, each of 23 technology training specialists served a school pyramid and other schools in an administrative area as needed. The specialists provided technology training, technical support, advice, and referral to other technology resources, with an emphasis on training. According to the program's service delivery model, the specialists were expected to allocate 70 percent of their time to training.

An evaluation of PTT in its first year found that it was effective in meeting the needs of school staff and improving teachers' use of technology. School staff reported satisfaction with the technology training and technical support services they received, and they judged that the program was having a positive impact on teaching and learning. Further, teachers who received training or individual help from a PTT specialist reported increased use of technology for instructional purposes. However, the specialists spent less time on training activities than intended, and secondary teachers were less likely than elementary teachers to participate in training activities. The Year One report recommended continuation of the evaluation for a second and final year.

The Year Two Evaluation

During the 1995-1996 school year, the Office of Program Evaluation assessed the implementation and effectiveness of PTT. The Year Two evaluation addressed seven questions, four concerned with program implementation and three with program effectiveness. The implementation questions were: 1) How was the specialists' time allocated? 2) What training activities did the specialists offer? 3) To what extent did elementary and secondary teachers participate in the training activities? 4) How did the specialists describe their approach to the task of facilitating improved use of technology by teachers and students?

The three questions concerning program effectiveness were: 1) How effective were the specialists in meeting the technology needs of school staff? 2) Did trained teachers report more frequent use of technology than non-trained teachers? 3) Compared to non-trained teachers, were trained teachers more likely to report positive changes in students' use of technology?

The evaluation was based on data provided by the specialists, including time allocation estimates and activity descriptions, and on survey data provided by teachers, administrators, and school-based computer leaders. Questions about program effectiveness were addressed with data from school staff, while implementation questions were addressed primarily with data provided by the specialists.

Results of the Year Two Evaluation

Program Implementation

How was the specialists' time allocated? The specialists' allocation of time to training in Year Two, 57 percent, fell short of the originally intended 70 percent. Because the program planners wished to emphasize training, they set a goal of 70 percent. This initial goal, though worthy, was probably optimistic. It simply underestimated the magnitude of the competing demands for technical support, advice, and referral to other technology resources that would be placed on the specialists once they started working in schools.

What training activities did the specialists offer? The specialists offered training activities for teachers, administrators, media specialists, and clerical staff that were broad in scope and varied in format. The content of the training ranged from the basics of operating computers and related equipment to word processing, graphics, spreadsheet applications, and sophisticated curriculum-specific applications of instructional software, telecommunications, and use of multimedia and videodisc technology. Training formats included working with individual school staff, conducting short impromptu sessions with small groups, modeling technology use with students in classes, and offering single- or multiple-session mini-courses on selected topics. Much of the training during school hours was, of necessity, one-on-one training with individual teachers that lasted for the duration of the teacher's planning period. Longer classes or sessions for groups of teachers were scheduled on Monday afternoon early closings in elementary schools; otherwise such extended sessions were possible only when funds were available to hire substitute teachers.

In all of the administrative areas in 1995-1996, the specialists offered training before and after school hours as well as during regular school hours. Specialists in three of the areas published catalogs listing training sessions that were offered after school to teachers from any school in their area. In addition, specialists in one of the areas published a training catalog for administrators. More than 100 different training sessions were offered through these catalogs in the spring of 1996.

To what extent did elementary and secondary teachers participate in the training activities? Data from the teacher surveys showed a higher training participation rate for elementary teachers than secondary teachers across the two-year period. The elementary-secondary difference in Year Two, 74 versus 59 percent, was considerably smaller than it was in Year One, 85 versus 56 percent. Elementary teachers may be more motivated to attend training activities because they are more likely to have a computer in their classroom.

The survey data also showed that PTT has moved beyond basic computer operation and software applications to address directly its objectives of improving teaching, learning, and school staff productivity. For elementary teachers, both integrating technology and using multimedia technologies, which focused on teaching and learning, were more heavily attended over the two-year period than *ClarisWorks* or *Microsoft Office*, which emphasized basic software applications. For

secondary teachers, using technology to enhance personal productivity was more heavily attended over the two-year period than *ClarisWorks* or *Microsoft Office*.

How did the specialists describe their approach? The specialists' activity descriptions revealed the challenges they saw themselves as facing and their strategic response to these challenges. One major challenge was a diverse clientele of school staff with varying resources and skills. The specialists responded by treating needs assessment as a critical ongoing activity, facilitating change in technology use "anyway they could," and developing catalogs for after-school training sessions on topics that fit their particular expertise.

The second major challenge faced by the specialists was limited availability of teachers for training. Almost all of them wrote that teachers had little free time and were often unavailable for training. The specialists responded to this challenge by: developing after-school training catalogs, recruiting school staff to attend the sessions, and conducting the sessions; and by demonstrating technology use in teachers' classes. They maintained a strong focus on *technology integration*, or curriculum-specific applications of technology.

The third challenge faced by the specialists was competing demands for technical support, advising, and referral services. To meet these non-training demands, the specialists combined technical support with teaching school staff to solve their own technical problems, trained students to solve minor technical problems, and established a Help Desk to offer a reliable and easily accessible technical resource to schools.

Program Effectiveness

How effective were the specialists in meeting the technology needs of school staff? Survey data indicated that the specialists were effective in meeting the needs of school staff. Ninety percent of the trained teachers were either satisfied or very satisfied with the quality of the training. Ninety-two percent of the teachers who received individual help on a technical problem, instructional application, or productivity-enhancing application were either satisfied or very satisfied. At least 72 percent of the administrators and 65 percent of the school-based computer leaders agreed that the specialists provided high quality staff development to integrate technology in classroom learning activities, effectively solved problems with hardware and software, helped their school with technology planning and/or purchasing, helped school staff by referring them to other departments and offices with technological expertise, and helped school staff with the county needs assessment process for planning and implementing a network.

Did trained teachers report more frequent use of technology than non-trained teachers? Trained teachers reported more frequent instructional use of computers and software, multimedia technologies, and telecommunications, and more frequent use of technology to enhance productivity than non-trained teachers. These differences in reported technology use were not due to differential access to computers, defined as the number of computers in the teacher's classroom.

The impact of training varied across levels of technology access. For teachers with no computer in their classroom, the increased frequency of technology use that resulted from training was more than large enough to be judged significant in a practical as well as statistical sense. For example, the average two-year participant in training with no computer reported using technology to enhance productivity "at least once a week," whereas the average non-participant with no computer reported using technology to enhance productivity "at least once a month." For teachers with one computer in their class, training effects were weaker yet strong enough to be considered of practical benefit. For teachers with two or more computers, the effect of training was very small, but it should not be inferred that these teachers received no benefit from training. It is possible that training affected the quality of teachers' technology use without increasing its frequency.

Compared to non-trained teachers, were trained teachers more likely to report positive changes in students' use of technology? Survey data also showed that two years of teacher training was associated with positive changes in the frequency or effectiveness of student use of technology, including word processing, spreadsheets, data bases, graphics and design, telecommunications, multimedia technologies, and presentation software. Because the surveyed teachers were asked to rely on their memory of student use in the previous year, this finding should be interpreted cautiously.

Conclusions and Recommendations

In conclusion, Pyramid Technology Training (PTT) has functioned effectively over the past two years as a comprehensive and adaptive, in-school technology training and technical support program. As documented in this report, PTT has moved beyond basic computer operation and software applications to address its objectives of improving teaching, learning, and school staff productivity. The data demonstrate that the program has met the diverse needs of school staff, and produced practical benefits for teachers, increasing their use of technology. In addition, the data suggest that students may have increased the frequency or effectiveness of their use of technology as a result of teacher training or in-class modeling by a specialist. These positive effects occurred despite limited availability of teachers for training and strong demands from school staff for non-training services. If these two constraints on program effectiveness were removed, even better results might be achieved.

Two recommendations are supported by the results of the evaluation. Administrators should seek ways of: (1) increasing the availability of teachers for training and their participation in training, especially at the secondary level; and (2) reducing schools' use of the specialists to provide non-training services — technical support, advising, and referral. The specialists have already responded, as best they could, to the challenges of limited teacher availability and demands for non-training services. They offered training after school, demonstrated technology use in classrooms, and taught school staff and students to solve their own technical problems whenever they could. Therefore the two recommendations imply a need for additional funds to hire substitute teachers and perhaps a technical support specialist for each pyramid.

EVALUATION OF PYRAMID TECHNOLOGY TRAINING: FINAL REPORT

Introduction

Pyramid Technology Training (PTT) completed its second year in the summer of 1996. The purpose of the program was to improve teaching, learning, and school staff productivity in the Fairfax County Public Schools (FCPS). To accomplish this purpose, each of 23 technology training specialists routinely served a school pyramid and served other schools in an administrative area as needed. The specialists provided technology training, technical support, advice, and referral, with an emphasis on training. According to the service delivery model that had been developed for the program, the specialists were expected to spend the majority of their time in schools and 70 percent of their time on training school staff.

The Year One evaluation found that PTT was effective in meeting the needs of school staff and improving teachers' use of technology. School staff were satisfied with the technology training and technical support services they received, and they judged that the program was having a positive impact on teaching and learning. Further, teachers who received training or individual help from a PTT specialist reported increased use of technology for instructional purposes. However, the specialists spent less time on training activities than expected, and secondary teachers were less likely than elementary teachers to participate in training activities. The Year One report recommended continuation of the evaluation for a second and final year.

The Year Two Evaluation

During the 1995-1996 school year, as in 1994-1995, the Office of Program Evaluation (OPE) assessed the implementation of PTT and its effectiveness in meeting the needs of school staff and improving use of technology. The assessment of implementation included training participation rates for elementary and secondary teachers, estimates of how the specialists spent their time, descriptions of the training activities offered, and descriptions of how the specialists approached the task of facilitating more effective use of technology. How the specialists approached their task had not been studied previously. The assessment of effectiveness included the degree to which the needs of school staff were being met and the extent to which teachers' and students' use of technology was increasing in frequency or improving in quality. Students' use of technology had not been studied previously.

Evaluation Questions

The Year Two evaluation addressed seven questions, four concerned with program implementation and three with program effectiveness. The implementation questions were:

- How was the specialists' time allocated?
- What training activities did the specialists offer?
- To what extent did elementary and secondary teachers participate in the training activities?

- How did the specialists describe their approach to the task of facilitating improved use of technology by teachers and students?

The three questions concerning program effectiveness were:

- How effective were the specialists in meeting the technology needs of school staff?
- Did trained teachers report more frequent use of technology than non-trained teachers?
- Compared to non-trained teachers, were trained teachers more likely to report positive changes in students' use of technology?

The last effectiveness question and the last implementation question above were "new" questions not asked in the Year One evaluation.

Evaluation Methods

The evaluation was based on data provided by the specialists, including time allocation estimates and activity descriptions, and on survey data provided by teachers, administrators, and school-based computer leaders. The specialist-provided data addressed the implementation questions. The school staff survey data addressed the questions about program effectiveness and one of the implementation questions.

Time Allocation Estimates

From December 1995 through May 1996, each specialist submitted two weekly time allocation estimates (see Appendix A for a copy of the reporting form). The first estimate was the percent of time spent (1) in schools, (2) providing out-of-building or generic service to multiple schools, and (3) in "other," primarily administrative activities. Service in schools was exactly that; the specialist was physically present and providing services in a school building. Service "to" schools included planning and preparation for training at multiple sites, scheduling time in schools, and responding to calls and school-initiated requests. These activities generally occurred in the area office. Other activities included self-initiated professional development, administrative duties (e.g., required meetings and paperwork), and in-county travel.

The second weekly estimate was the percent of time spent in one of four mutually exclusive activities: (1) staff and student development, i.e., technology training; (2) technical support, i.e., technical trouble-shooting; (3) technical advising; and (4) "linkage," i.e., referral to other technology resources, usually to other offices and departments in FCPS. Advising included needs assessment, planning, and advice with respect to a school's developing networking capabilities, as well as advice on the purchase of computer-related equipment. *Technical support* was defined as activity in which the specialist's primary intent was to change the "behavior" of a machine, although most such activity involved an attempt to simultaneously teach users to solve problems with hardware or software on their own. Examples were showing a teacher how to set up computer printers or install software. Lastly, *staff and student development* was defined as activities that "focus on people; on helping

people get the most from computers, computer-related equipment, and computer programs that are already available at a school; on the uses or application of technology rather than technology per se." Staff development "effectively changes the behavior of teachers, administrators, clerical staff, or students, so they can acquire information and manage data more effectively." Staff development included preparation for training sessions as well as actual training activity. Examples were training classroom teachers and students on *ClarisWorks*, modeling use of CD-ROM and multimedia in the classroom or library, and preparing materials for a training session on integrating technology in the K-3 classroom.

Activity Descriptions

In February and March 1996, each specialist wrote a two-page description of his or her activities. A two-part question served as a prompt: How do you facilitate improved use of technology by teachers and students, and how would you like to do this? An OPE staff member analyzed the content of these descriptions. In addition to the activity descriptions, OPE reviewed the specialists' published catalogs of spring 1996 training sessions for teachers and administrators, which are included in Appendices B and C.

An initial reading of the activity descriptions revealed that the specialists had portrayed not only what they did but also the context in which they were operating. In fact, one cannot readily understand the approach without understanding the context. Therefore, two goals were set for the content analysis of the activity descriptions: to understand and describe the primary challenges the specialists saw themselves as facing, and to understand and describe the specialists' strategic response to these challenges. The specialists' descriptions were viewed through the lens of a person who had conducted focus groups with the specialists in 1994-1995, attended dozens of PTT meetings, and personally spoken with each of the specialists on numerous occasions.

Surveys

There was a Teacher Survey, a School-Based Computer Leader Survey, and an Administrator Survey. The content of the surveys for administrators and school-based computer leaders was essentially the same as it was in Year One, except for a small number of new, deleted, or reworded items. A thorough revision of the Teacher Survey in collaboration with the specialists produced a new set of items to assess teachers' perceptions of their students' use of technology, an updated set of items to assess teachers' participation in staff development activities, and improved wording of other items. The total number of items was 37 on the Teacher Survey, 25 on the School-Based Computer Leader Survey, and 13 on the Administrator Survey. Copies of the surveys are provided in Appendices D through F.

In April 1996, OPE sent the Teacher Surveys to a random sample of 500 teacher scale employees. The sample included resource and itinerant teachers, guidance counselors, and librarians as well as the predominant group of regular classroom teachers. In June 1996, OPE sent one School-Based Computer Leader Survey and one Administrator Survey to each school in the system, including

alternative schools and centers. Administrator Surveys were addressed to the principal, who received a cover letter stating that the task of survey completion could be delegated to another administrator at the school if desired. School-Based Computer Leader Surveys were addressed to the staff member at each school who the specialist regarded as his or her primary contact. Typically this was a technology coordinator or computer lead person, but administrators and librarians were designated as the primary contact in some cases.

A total of 303 teachers returned surveys for a return rate of 61 percent. Among the 303 teachers who responded, 66 percent were regular classroom teachers. Fifty-three percent were secondary teachers. The four administrative areas were represented in percents ranging from 21 to 30. Seventy-four percent of the teachers reported having at least one computer in their classroom; 44 percent reported that the newest computer in their room was an Apple Macintosh; and 69 percent reported that their students generally spent one or more hours per week in a computer lab. Also, 51 percent rated their own efforts in acquiring needed technology skills and knowledge as strong or very strong; and 57 percent reported that they were either comfortable or very comfortable with computers and software.

The return rate for school-based computer leaders was 73 percent (182 out of 251). The respondent group consisted of 41 percent technology coordinators, 30 percent computer lead teachers, 10 percent administrators, and 7 percent media specialists. Sixty-one percent were from elementary schools; 60 percent were from schools where the principal provided class coverage for teachers participating in staff development activities; 73 percent were from schools with a technology committee that met regularly; 63 percent were from schools with one or two computers in the average classroom; and 72 percent were from schools with a computer lab. The respondents represented the four administrative areas in percents ranging from 22 to 30.

Finally, the return rate for administrators was 77 percent (153 out of 200). Seventy percent of the respondents were elementary school administrators, and percents for the four administrative areas ranged from 20 to 28. Fifty-three percent of the administrators said they had more than 10 opportunities to discuss technology issues with a specialist since September 1995; 91 percent had received individual help from a specialist in the past year; and 94 percent were either satisfied or very satisfied with the help they had received, if applicable.

Results and Discussion

This section is organized around the seven evaluation questions. It presents and interprets the quantitative and qualitative data collected in the 1995-1996 school year and relates these data to findings from Year One as appropriate. Overall conclusions and recommendations will be presented in the final section.

Implementation Question 1: How Was the Specialists' Time Allocated?

The specialists estimated that, for the six-month period from December 1995 through May 1996, they spent 60 percent of their time providing services *in* school buildings, 29 percent of their time

providing services *to* schools (e.g., planning and preparation for training at multiple sites), and 11 percent in other (e.g, administrative) activities, as shown in Figure 1. The specialists also estimated that, across the six-month period from December 1995 through May 1996, they spent 57 percent of their time in staff development (training) activities, 23 percent in technical support (trouble-shooting) activities, 16 percent in advising, and 4 percent in linkage, as shown in Figure 2.

Discussion. The data in Figure 1 indicate a reasonably good and improving match between implementation of the program and the intentions of its designers and managers. As intended, the specialists spent the majority of their time in schools, and they spent nearly 90 percent of their time in activities that served schools directly. The "other" category of self-initiated professional development, administrative duties, and in-county travel consumed just over 10 percent of the specialists' time in Year Two, compared with 20 percent in Year One. Considering the skill requirements of the job, the size and complexity of an organization like FCPS, and the fact that each specialist worked in eight or more schools, 10 percent seems low.

The data in Figure 2 show that the specialists' allocation of time to staff development in Year Two, 57 percent, fell short of the originally intended 70 percent. Also, the percent for staff development was only slightly higher than it had been in Year One, 54 percent. Because the program planners wished to emphasize staff development, they set a goal of 70 percent staff development. This initial goal, though worthy, was probably optimistic. It simply underestimated the magnitude of the competing demands for technical support, advising, and linkage that would be placed on the specialists once they started working in schools.

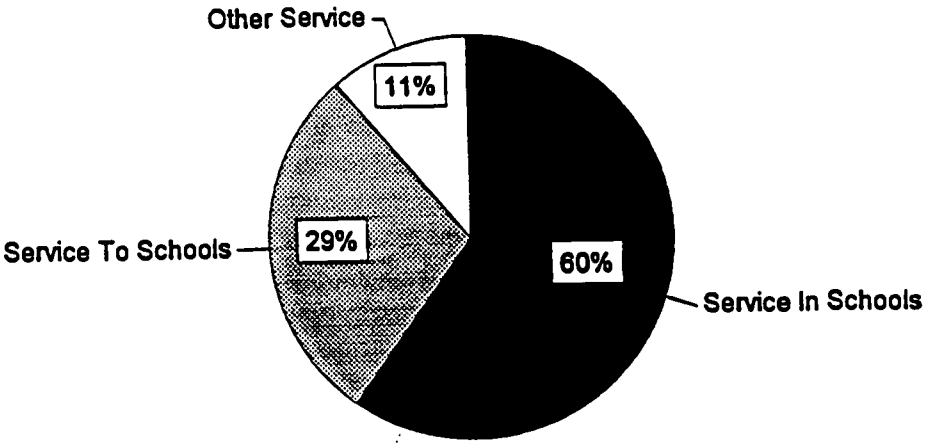
Much of the specialists' advising in Year Two was helping schools to envision future educational uses of local and wide area networks, and this activity could be viewed as a form of "staff development." However, in estimating their use of time, the specialists adhered to a narrower definition of staff development that emphasized existing equipment and training with immediate tangible benefits for teachers and students.

Implementation Question 2: What Training Activities Did the Specialists Offer?

The specialists' activity descriptions and training session catalogs indicated training activities that were broad in scope and varied in format. The recipients of training were not only teachers but also administrators, media specialists, and clerical staff. The content of the training ranged from the basics of operating computers and related equipment to word processing, graphics, spreadsheet applications, and sophisticated curriculum-specific applications of instructional software, telecommunications, and use of multimedia and videodisc technology. The specialists worked with individual school staff, conducted short impromptu sessions with small groups, modeled technology use with students in classes, and offered single- or multiple-session mini-courses on selected topics. Training occurred during regular school hours, after school, and before school in what one specialist dubbed "early bird specials."

Figure 1

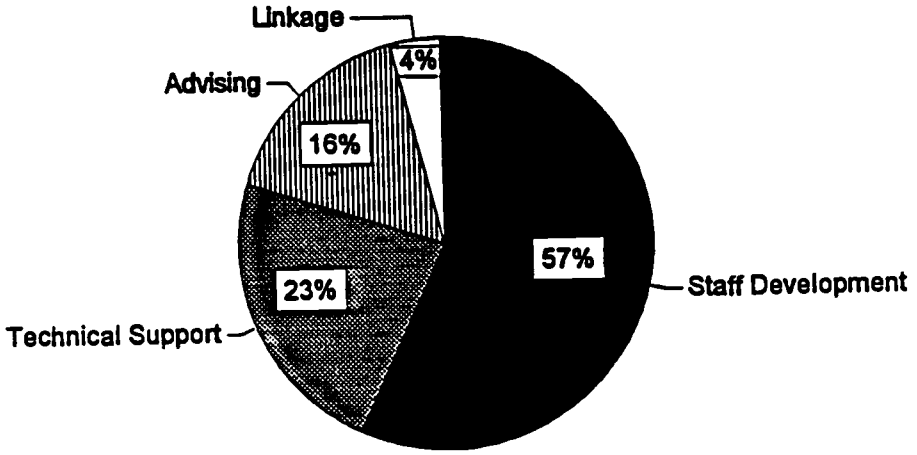
Technology Training Specialists' Estimated Allocation of Hours



Note: "Service to schools" is planning and preparation for training at multiple sites performed in area office.

Figure 2

Technology Training Specialists' Estimated Activity Allocation



Much of the training that took place during school hours was, of necessity, one-on-one training with individual teachers that lasted for the duration of the teacher's planning period, no more than 50 minutes. Longer classes or sessions for groups of teachers were possible only when funds were available to hire substitute teachers or, in the case of elementary schools, on Monday afternoon early closings. A third option was to model instructional use of technology with students in a consenting teacher's class. According to the specialists, this kind of in-school training was difficult to arrange and therefore less common than working with individual staff during free periods.

In all of the administrative areas in 1995-1996, the specialists offered training before and after school hours as well as during regular school hours. Specialists in three of the areas developed catalogs listing training sessions that were offered after school to teachers from any school in their area. In addition, specialists in one of the areas developed a training catalog for administrators, with sessions both during and after school. More than 100 different training sessions were offered through these catalogs in the spring of 1996. Following are some illustrative session titles: Making You and Your Macintosh Happy; Integrating Technology in the 4-6 Classroom; Using a Computer to Make a Teacher's Life Easier; Create Multimedia Presentations with A/V Mac, and MS-Word; and Presenting Data with Tables and Charts. For more information on the content of these and other training sessions, see Appendices B and C.

Implementation Question 3: To What Extent Did Elementary and Secondary Teachers Participate in the Staff Development Activities?

The Teacher Survey included items designed to assess participation in training. The items covered ten training topics that the specialists judged to be the most common forms of training provided during the 1995-1996 school year. The ten topics are displayed in the first column of Table 1 and Table 2 (see Appendix D for supporting examples included in the survey items).

Table 1 presents participation data for elementary teachers who returned the survey, i.e., respondents only. The columns of the table show the percent of teachers participating in training activities in Year One only (1994-1995),Year Two only (1995-1996), both years, and at least one year, which is the sum of these. The rows of the table show the percent of teachers participating in each of the ten specialist-led training activities, and the bottom row indicates the percent of teachers participating in at least one training activity. There are several noteworthy results. Almost three fourths (74 percent) of the elementary teacher respondents reported participating in at least one training activity during the two-year period of the evaluation. Since the program's inception in the fall of 1994, 57 percent participated in training that was aimed at integrating technology into instruction, and 52 percent participated in training on using multimedia technologies as an instructional tool. Finally, in Year One the training topic with the highest teacher participation rate was *ClarisWorks* or *Microsoft Office*, whereas in Year Two, the training topics with the highest participation rates were integrating technology into instruction and using multimedia technologies as an instructional tool.

Table 1
Elementary Teachers' Participation in Specialist-Led Training, by Topic and Year

Training Topic	Percent of Respondents Participating in ...			
	Year One Only	Year Two Only	Both Years	Total
Integrating technology into instruction	13	18	26	57
ClarisWorks or *Microsoft Office*	19	14	15	48
Macintosh or *Windows* fundamentals	10	12	13	35
Using multimedia technologies as an instructional tool	13	18	21	52
Using telecommunications as an instructional tool	8	9	6	23
Presentation software	11	14	11	36
AlphaSmarts or *DreamWriters*	8	7	4	19
Using technology to enhance personal productivity	9	10	12	31
Local area network management and use	3	4	3	10
Any other topic	1	10	16	27
At Least One Training Activity*	**43**	**48**	**36**	**74**

* The sum of the percents in the first three columns is greater than the percent in the fourth column due to overlap among the items.

Table 2
Secondary Teachers' Participation in Specialist-Led Training, by Topic and Year

Training Topic	Percent of Respondents Participating in ...			
	Year One Only	Year Two Only	Both Years	Total
Integrating technology into instruction	10	11	11	32
ClarisWorks or *Microsoft Office*	14	10	8	32
Macintosh or *Windows* fundamentals	16	7	5	28
Using multimedia technologies as an instructional tool	8	9	8	25
Using telecommunications as an instructional tool	4	18	5	27
Presentation software	4	8	1	13
AlphaSmarts or *DreamWriters*	0	3	1	4
Using technology to enhance personal productivity	8	10	18	36
Local area network management and use	3	5	2	10
Any other topic	6	6	7	19
At Least One Training Activity*	**38**	**37**	**26**	**59**

* The sum of the percents in the first three columns is greater than the percent in the fourth column due to overlap among the items.

Table 2 displays, in the same format as Table 1, participation data for secondary teachers. Fifty-nine percent of the secondary teacher respondents participated in at least one training activity during the two-year period. Thus, the overall participation rate of 59 percent for secondary teachers was lower than the rate of 74 percent for elementary teachers. For secondary teachers, the training topic with the highest participation rate was using technology to enhance personal productivity as a teacher. Other popular topics for secondary teachers across the two-year span were integrating technology into instruction, *ClarisWorks* or *Microsoft Office*, Macintosh or *Windows* fundamentals, and using telecommunications as an instructional tool. The rate for telecommunications increased sharply between Year One and Year Two. Telecommunications and personal productivity were the only topics that showed a higher participation rate for secondary teachers than elementary teachers.

Overall, the data in Tables 1 and 2 make the significant point that PTT has moved beyond operational mechanics and basic software applications to address directly its objectives of improving teaching, learning, and school staff productivity. For elementary teachers, both integrating technology and using multimedia technologies, which focused on teaching and learning, were more heavily attended over the two-year period than *ClarisWorks* or *Microsoft Office*, which emphasized operational mechanics and basic software applications. For secondary teachers, using technology to enhance personal productivity was more heavily attended over the two-year period than *ClarisWorks* or *Microsoft Office*.

Discussion. These survey data may not provide unbiased estimates of the percentages of FCPS elementary and secondary teachers who have been trained. Although surveys were originally sent to a random sample of teachers, only 61 percent of them responded. If teachers who participated in training were more likely to return a survey than teachers who did not participate in training, the percentages in Tables 1 and 2 overestimate true participation rates. Although the degree of overestimation, if any, is unknown, it is possible to establish a lower bound and a more plausible intermediate value for the true participation rates. In the unlikely event that *none* of the 197 non-respondents were trained, the actual participation rates would be 36 and 32 percent for elementary and secondary teachers, respectively. If the non-respondents were just half as likely to participate in training, the true rates of participation in at least one activity in at least one year would have been 56 percent for elementary teachers and 46 percent for secondary teachers. Even these conservative estimates of participation seem respectable considering the short time the program has been operating, the number of teachers in the system relative to the number of specialists, and a factor discussed in the next section, the limited availability of teachers for training.

Two conclusions can be drawn from Tables 1 and 2 despite the limitations of survey data. First, teachers are participating in training sessions that attempt to integrate technology with teaching and learning, training sessions that focus on classroom applications of technology. The qualitative data reviewed in the next section provide additional support for this conclusion.

Second, there was a higher participation rate for elementary teachers than secondary teachers across the two-year period. This elementary-secondary difference, 74 versus 59 percent, was considerably smaller than it was in Year One, 85 versus 56 percent. The difference in participation rates may be

due to the greater availability of computers in elementary classrooms. A much higher proportion of elementary teachers than secondary teachers had two or more computers in their classroom (57 versus 21 percent). There was a large difference in participation rates among the group of teachers with two or more computers — 81 percent for elementary teachers and 62 percent for secondary teachers, but a trivial difference in participation rates among teachers with one computer or no computer in their classroom — 64 percent for elementary and 58 percent for secondary teachers.

Implementation Question 4: How Did the Specialists Describe Their Approach?

As stated previously, the specialists' activity descriptions were analyzed for the purpose of understanding and describing the challenges they faced and their strategic response to these challenges. Three major challenges were evident from the analysis: a diverse clientele of school staff with varying technology resources and skills; limited availability of teachers for training; and competing demands for technical support, advising, and referral services. It was also apparent that in attempting to meet these challenges, the specialists were resourceful and committed to achieving the program's goals.

Diverse clientele with varying resources and skills. The specialist-submitted material indicated that in a typical school pyramid and within each of the administrative areas, there were different types of computers and related equipment, and a wide array of software applications in use. Some schools had up-to-date equipment while others used out-dated donated computers; some schools were being cabled through the county renovation process while others had been networked for years; and some schools were model technology schools or schools supporting special technology initiatives while others were in the earliest stages of technology infusion. In every school, staff varied in technology comfort, knowledge or skill, and motivation to learn. Moreover, the equipment, software, and staff comfort and skill levels were changing constantly.

Part of the specialists' response to diverse and changing needs was to treat needs assessment as a critical, ongoing activity. As in Year One, they spent substantial amounts of time discussing training and other needs with building administrators, department chairs, computer lead teachers, technology committee members, regular teachers, librarians, and clerical staff. These discussions allowed the specialists to tailor their services for specific schools, groups within schools, and individuals.

Once needs were identified, the specialists attempted to facilitate change in technology use "anyway they could," as one of them put it. For example, in an elementary school that had no computers in classrooms, the specialist began by begging other schools for their old Atari computers "to put keyboards in the hands of students." At the other extreme, a high school had been networked for nearly six years with school-wide Internet access for four of those years, and its staff members were well on their way to viewing and using technology as a powerful tool. In serving this school, the specialist acted as a liaison between FCPS staff who were responsible for technical aspects of the network and school staff committees concerned with functional issues of network access and use.

In developing the catalogs for after-school training, the specialists took a cooperative approach to meeting diverse needs more effectively. The after-school sessions were open to school staff from all of the pyramids within an administrative area, and individual specialists or teams of specialists conducted sessions on topics that fit their particular expertise. Thus, the specialists became, as a member of one area team put it, "seven people serving 53 schools." The response to the training catalogs was very good, based on registration and attendance records kept by the specialists. Some specialists even described the response as "overwhelming" and "magnificent." However, the specialists recognized that these after-school sessions served only one segment of the target population of school staff, "self-starters" who were highly motivated to learn.

In the typical elementary school, there was at least one computer in every classroom, so the specialists could proceed with what they called *technology integration*, or curriculum-specific application of technology. For example, one specialist made inquiries with individual teachers or teams of teachers regarding possibilities for creating units and lessons for specific curricula. Another specialist tried to "win over" individual teachers who informed other teachers of the value of using technology within their curriculum. This was accomplished by modeling hardware or software use with students in the teacher's class. A third specialist, working at an elementary school whose staff had developed a list of student technology competencies, selected a particular competency, created a lesson to address it, and went through the lesson with a teacher.

The data in Tables 1 and 2 and the specialists' activity descriptions suggest an increasing focus on curriculum-specific application or technology integration. Several specialists reported that the training they did in 1995-1996 was more centered around the Program of Studies. They said that in 1994-1995, the program's initial year, much of the training focused on the basic skills of "how to use" (operate) a piece of software or hardware such as a laserdisc player. In 1995-1996, they continued to provide "how to use" training as needed, which was often. However, they tried to steer teachers toward training that focused on "how to apply" software and hardware in particular instructional circumstances.

One specialist offered this insightful description of the process of teacher change leading to technology integration:

> [This year I have focused] much of the training on the "Ah Ha's" of technology use and integration. I have found that teachers don't always ask what the capabilities are with a given piece of technology. If they [first] learn ... how it can be useful in a teaching/learning situation they seem to be more apt to want to learn the "operational skills" of using the technology...The operational skills are easy to learn and often come much faster than learning to integrate the technology.

Limited availability of teachers for training. Almost all of the specialists wrote that teachers had little free time and were often unavailable for training. The specialists regretted having to work primarily with individual teachers for brief periods, and wished that there was more money to hire substitute teachers. They also pointed out that some principals were reluctant to use their substitute funds for technology training and that some elementary principals chose to use their Monday

afternoon early closing time for other forms of staff development or teacher planning. Following are excerpts from the specialists' activity descriptions.

- Organized classes, even for a small group, have to be scheduled after school hours, after teachers have been working hard for eight hours.
- It is frustrating for myself and the teachers to have to stop after 45 minutes or an hour.
- The foremost challenge is to find adequate time to spend with each of my school's staff, let alone their students.
- One of the major obstacles is meeting teachers during the day. When are the [needed additional] funds for contract time staff development going to be budgeted?
- The most you can hope to accomplish [during school hours] is to whet their appetite.
- If teachers were given release time during the day for training, I feel that we would see both personal and instructional use [of technology] skyrocket.

These comments send an important message: If the success of PTT is to be judged by its impact on teachers, then teachers must be available for training.

At least one specialist considered himself fortunate to have principals in his pyramid who were generous (or blessed) with substitute money. These principals hired four substitute teachers and rotated them throughout the day, giving the specialist two-hour blocks with each grade level over a period of days. Another specialist worked with the technology committees at three of her elementary schools to provide day-long full-staff inservices. These examples illustrate the kind of support that is needed to facilitate technology integration, as opposed to operational skills.

The specialists' two main strategies for coping with the limited availability of teachers have been noted previously. First, they developed the after-school training catalogs, recruited staff to attend the sessions, and conducted the sessions. Second, they demonstrated technology use in teachers' classes. With this approach, substitute funds were not needed, and technology integration was fostered directly in a way that stimulated both the specialist's and the teacher's thinking about integration. Recognizing the potential power of in-class demonstrations, several specialists said they would like to do more of them.

The specialists found other ways to alleviate the problem of teacher availability that, like the above coping strategies, cost the system nothing. These included: working on a committee to develop technology competencies for teachers and students; and working with administrators to upgrade their technology skills, inform them about the uses of technology, and encourage them to set expectations for their staff. The thinking here was that if administrators serve as knowledgeable and enthusiastic models for teachers, and if more is expected of teachers and the expectations are made clear, more teachers will attend staff development activities.

One specialist made what seems to be a sensible connection between limited teacher availability and technology integration: "Learning the integration of technology into instruction should be done ON contract time." This is certainly true if in-class demonstrations are vital for technology integration.

Competing demands for technical support, advising, and referral services. The third challenge faced by the specialists was competing demands for technical support, advising, and referral services. These non-training demands were quantified in this evaluation. As Figure 2 shows, the Pyramid Technology *Training* Specialists estimated that they spent 43 percent of their time on activities that were not training!

In describing what they would like to do, a number of specialists said they would prefer to spend more time on training and less time on technical support, advising, and referral. They suggested that a technical specialist was needed in each pyramid to free them to do more training. In fact, as several of them pointed out, this had been the original plan: "We need to complete the original plan and have a technical person assigned to each pyramid." Here too there is an important message: If the success of PTT is to be judged by its impact on teachers, then the specialists must have time to engage in teacher training.

During the past two years, the specialists have had to meet non-training demands by themselves. They did so in some clever ways that prevented further erosion of their training time. By combining technical support with teaching, the specialists routinely sought to increase the capacity of school staff to solve their own technical problems. For example, a specialist who was installing software would simultaneously show a teacher how to do this. The specialists also encouraged teachers who were experiencing technical difficulties to rely on resources within their school. An interesting extension of this idea was to train students to solve minor technical problems. This was done both informally and through the training catalogs that included a course called SWAT (Student Workers Applying Technology). In the SWAT course, teachers learned how to involve students in troubleshooting, peer training, and the day-to-day management of computers.

In one of the areas, the specialists established a Help Desk to offer a reliable and easily accessible technical resource to schools. Each week one of the specialists remained in the area office all day to answer calls about technical problems. A voice mailbox was also available at all times, and the specialists guaranteed a response within 24 hours. The designated specialist talked callers through the steps necessary to solve their problem, or referred them to another specialist or the Electronic Systems Services Office (ESSO). The specialists received positive feedback from schools on the Help Desk and regarded it as a success.

In summary, the specialists described themselves as facing three challenges — a diverse clientele with varying resources and skills, limited availability of teachers for training, and competing demands for non-training services. In meeting these challenges, the specialists appeared to be responsive, resourceful and adaptive, and strongly committed to technology integration. The impression drawn from the activity descriptions is that the specialists' unwavering purpose was to improve teaching, learning, and staff productivity by increasing the frequency and improving the quality of curriculum- and classroom-specific applications of technology. Whether this purpose was achieved is a question of program effectiveness.

Effectiveness Question 1: How Effective Were the Specialists in Meeting the Technology Needs of School Staff?

The next evaluation question concerned the effectiveness of the specialists in meeting the technology needs of school staff. This was assessed with survey items measuring staff satisfaction and attitudes.

Teachers reported high levels of satisfaction with the quality of training and individual help they received from the specialists. Table 3 displays results for teachers who either participated in a training session led by a specialist or received individual help from a PTT specialist in the 1995-1996 school year. (Teachers who did not participate in training or receive individual help were excluded from the calculations.) Ninety percent of the specialist-trained teachers were either satisfied or very satisfied with the quality of the training. Ninety-two percent of the teachers who received individual help on a technical problem, instructional application, or productivity-enhancing application were either satisfied or very satisfied.

Other data from the surveys (not shown in Table 3) suggest underlying reasons for the teachers' satisfaction. Eighty-three percent of the teachers reported that they were able to apply what they had learned. This result implies that the content of the training matched the teachers' needs. In addition, school-based computer leaders, many of whom were teachers and all of whom were knowledgeable about PTT, either agreed or strongly agreed that the specialists effectively identified training needs at their school (79 percent), provided training that was relevant to the school's technology goals (88 percent), and provided training that was appropriate for the school's staff (88 percent).

Table 4 reports results for five items that assessed attitudes toward the specialists' services. The five items were common to the surveys for administrators and school-based computer leaders. The first four items covered the categories of service activity that were used in the time estimates — training, technical support, advising, and referral ("linkage"). The fifth item concerns a new activity undertaken by the specialists in Year Two, needs assessment for local and wide area networks in schools. Although this activity was considered part of the specialists' advising services, it warranted a separate item because it required a good deal of their time in 1995-1996.

According to the data in Table 4, at least 72 percent of the administrators and 65 percent of the school-based computer leaders agreed that the specialists provided high quality staff development to integrate technology in classroom learning activities, effectively solved problems with hardware and software, helped their school with technology planning and/or purchasing, helped school staff by referring them to other FCPS technology resources, and helped school staff with the county needs assessment process for planning and implementing a network. Both groups of respondents felt that the specialists were especially effective in solving problems with hardware and software and helping their school with technology planning and purchasing. Fewer respondents agreed or strongly agreed that the specialists helped school staff with the county needs assessment process for networks, partly because some of them were unaware of it (note the higher percentages in the "not applicable or insufficient information" category for the network item).

Table 3
Teachers' Satisfaction with Training and Individual Help

If you participated in a training session in 1995-1996, how satisfied were you with the quality of the training?	Percent			
	very satisfied	satisfied	dissatisfied	very dissatisfied
	27	63	5	5

If you received individual help from a Pyramid Technology Training specialist this year (1995-1996), how satisfied were you?	Percent			
	very satisfied	satisfied	dissatisfied	very dissatisfied
	51	41	5	3

Table 4
Administrators' and School-Based Computer Leaders' Attitudes Toward Specialist-Provided Services

The Pyramid Technology Training (PTT) specialist(s) provided high quality staff development to integrate technology in classroom learning activities.	Percent of Respondents				
	strongly agree	agree	disagree	strongly disagree	not applic. or insuff. info.
Administrators	38	39	15	1	7
Computer leaders	31	37	14	8	10

The PTT specialist(s) effectively solved problems with hardware and software.	Percent of Respondents				
	strongly agree	agree	disagree	strongly disagree	not applic. or insuff. info.
Administrators	45	43	9	1	2
Computer leaders	42	36	13	5	4

The PTT specialist(s) helped your school with technology planning and/or purchasing.	Percent of Respondents				
	strongly agree	agree	disagree	strongly disagree	not applic. or insuff. info.
Administrators	48	38	10	1	3
Computer leaders	47	31	10	4	8

The PTT specialist(s) helped staff at your school by referring them to other FCPS technology resources.	Percent of Respondents				
	strongly agree	agree	disagree	strongly disagree	not applic. or insuff. info.
Administrators	35	49	8	0	8
Computer leaders	38	39	11	3	9

The PTT specialist(s) helped staff at your school with the county needs assessment process for planning and implementing a network.	Percent of Respondents				
	strongly agree	agree	disagree	strongly disagree	not applic. or insuff. info.
Administrators	40	32	12	2	14
Computer leaders	39	26	11	6	18

Discussion. These data indicate that the specialists were effective in meeting the needs of school staff. The three groups surveyed were satisfied with the training, technical support, advising, and referral services provided by the PTT specialists. Regarding training, teachers reported that they were able to apply what they learned in training. School-based computer leaders rated the specialists as effective in identifying training needs and judged that the specialists' training was both relevant to staff needs and appropriate for staff.

Effectiveness Question 2: Did Trained Teachers Report More Frequent Use of Technology than Non-Trained Teachers?

This question was addressed with data from survey items covering teachers' reported use of computers and software, multimedia technologies, and telecommunications as an instructional tool, and teachers' reported use of technology to enhance their personal productivity. Responses to these items were coded from 1, representing "never or almost never," to 5, representing "almost every day." Results were compared for teachers who participated in corresponding training activities during both years, one of the two years, or neither of the two years. For example, reported frequency of use of multimedia technologies as an instructional tool was compared for teachers with zero, one, or two years of participation in a training activity on using multimedia technologies. The training participation groups varied in size; the non-participant group was largest (*n*s ranging from 162 to 210), and the two-year participant group was smallest (*n*s ranging from 16 to 51).

Because teachers were not randomly assigned to training groups, it is important to consider whether these groups were equivalent in other respects. Primary among the set of potentially confounding factors is access to technology, defined as the number of computers in the teacher's classroom. Teachers who have easy access to computers in their own classroom may be more inclined to use computers, and these same teachers may be more likely to participate in training. Preliminary analyses showed that access to technology was positively related to use, and further, that the training groups differed in access.

These circumstances made it necessary to evaluate training effects separately for each of three groups of teachers: those with no computer ($n = 70$), one computer ($n = 106$), or two or more computers ($n = 109$) in their class. For each type of technology use, a two-way analysis of variance was performed followed by comparisons of subgroup means. The two factors in the analysis were training participation (zero, one, or two years) and technology access (zero, one, or two or more computers in the teacher's class). Using the error term from this analysis, six comparisons were made: two-year and one-year training versus no training for teachers with no computer in their class, two-year and one-year training versus no training for teachers with one computer in their class, and two-year and one-year training versus no training for teachers with two or more computers in their class.

Table 5 displays teachers' mean frequency of reported instructional technology use by level of technology access, training condition, and type of use. Statistically significant differences ($p < .05$) between trained and non-trained groups are marked with a double asterisk, and near-significant

differences ($p < .10$) are marked with a single asterisk. For use of computers and software as an instructional tool, two-year training participants with no computer in their class reported significantly greater frequency of use than nonparticipants with no computer in their class. For use of multimedia technologies as an instructional tool, one-year training participants with one computer in their class reported significantly more frequent use than nonparticipants with one computer in their class. For use of telecommunications, two-year training participants with one computer in their class reported significantly more frequent use than nonparticipants with one computer in their class; and both one- and two-year participants with two or more computers reported significantly more frequent use than nonparticipants with two or more computers. The group of nonparticipants with no computer was too small ($n = 3$) to permit comparison with either of the participant groups with no computer.

Table 6 shows teacher's mean frequency of reported use of technology to enhance productivity. For teachers with no computer, both two- and one-year training participants reported significantly greater frequency of use than nonparticipants.

Summarizing the data in Tables 5 and 6, trained teachers reported more frequent instructional use of computers and software, multimedia technologies. and telecommunications, and more frequent use of technology to enhance productivity than non-trained teachers. These differences in reported technology use were not due to differential access to computers, defined as the number of computers in the teacher's classroom. However, the impact of training varied across levels of technology access. One way to show this is to look at *effect size*, defined as the difference between the means for trained and non-trained groups, divided by the standard deviation of the non-trained group. The median effect size for teachers with no computer in their class was .62, compared to median effect sizes of .25 for teachers with one computer and .07 for teachers with two or more computers, respectively. Thus, training had its greatest impact on frequency of use for teachers with no computer in their class.

Discussion. In all likelihood, PTT did increase teachers' use of technology for instruction and personal productivity. This conclusion is strengthened by comparing the responses of non-trained teachers surveyed in the spring of 1995 and the spring of 1996. As Table 7 shows, teachers' technology use does not increase in the absence of training. Thus, it is unlikely that factors other than training or access were operating to increase technology use for the trained groups.

For teachers with no computer in their classroom, the increased frequency of technology use that resulted from training was more than large enough to be judged significant in a practical as well as statistical sense. Judgment of the practical significance of a training effect can be made on an intuitive basis by considering what group differences actually mean. For example, the average two-year participant in training with no computer reported using technology to enhance productivity at least once a week, whereas the average non-participant with one computer reported using technology to enhance productivity at least once a month.

Table 5
Teachers' Mean Frequency of Reported Instructional Technology Use
by Level of Access, Training Condition, and Type of Use

Level of Access and Training Condition	Type of Use		
	Computers and Software	Multimedia Technologies	Telecommunications
No Computer in Class			
Two-Year Participation in Training	3.43**	2.50	1.33
One-Year Participation in Training	2.33	2.90*	1.89
No Participation in Training	1.77	2.06	---[a]
One Computer in Class			
Two-Year Participation in Training	3.75	2.75	2.14**
One-Year Participation in Training	3.57	3.30**	1.60
No Participation in Training	3.51	2.19	1.32
Two or More Computers in Class			
Two-Year Participation in Training	4.75	3.25	2.33**
One-Year Participation in Training	4.37	3.34	1.96**
No Participation in Training	4.56	3.13	1.46

Note. Double asterisks indicate a statistically significant difference in comparison to the non-trained group at $p < .05$; single asterisks indicate a near-significant difference in comparison to the non-trained group at $p < .10$. [a] Cell mean is not reported because there were fewer than five cases. Means may be interpreted as follows:

1 = never or almost never
2 = less than once a month
3 = at least once a month
4 = at least once a week
5 = almost every day

Table 6
Teachers' Mean Frequency of Reported Use of Technology to Enhance Productivity, by Level of Access and Training Condition

No Computer in Class	
Two-Year Participation in Training	4.27**
One-Year Participation in Training	3.71**
No Participation in Training	2.64
One Computer in Class	
Two-Year Participation in Training	4.53*
One-Year Participation in Training	4.43
No Participation in Training	3.80
Two or More Computers in Class	
Two-Year Participation in Training	4.46*
One-Year Participation in Training	3.30
No Participation in Training	3.67

Note. Double asterisks indicate a statistically significant difference in comparison to the non-trained group at $p < .05$; single asterisks indicate a near-significant difference in comparison to the non-trained group at $p < .10$. Means may be interpreted as follows:

1 = never or almost never
2 = less than once a month
3 = at least once a month
4 = at least once a week
5 = almost every day

Table 7
1995 and 1996 Mean Frequency of Reported Technology Use by Non-Trained Teachers

Type of Technology Use	1995	1996
Computers and Software as an Instructional Tool	2.80	2.89
Telecommunications as an Instructional Tool	1.32	1.37
Technology to Enhance Personal Productivity	3.55	3.50

Note. Non-trained teachers were teachers who neither participated in a training session led by a specialist nor received individual help from a specialist. Use of multimedia technologies as an instructional tool was not assessed in 1995. Cell *n*s ranged from 77 to 81.

Practical significance can also be judged in terms of effect size. The average effect size in educational research is .40 (Hattie, Biggs, & Purdie, 1996). Effect sizes above .20 are considered practically significant, and effect sizes above .60 are considered moderately strong. By these standards, the median effect size for teachers with no computer (.62) was moderately strong, and the median effect size for teachers with one computer (.25), while much weaker, was still strong enough to be considered of practical benefit. Finally, although the median effect size for teachers with two or more computers was very small (.07), it should not be inferred that these teachers received no benefit from training. It is possible that the quality of their technology use improved although its quantity (frequency) changed little. Also, for computers and software, the mean frequency of use for two-year participants, 4.75, approached the maximum value of 5.0. Here the absence of a training effect may reflect limitations of the rating scale, i.e., a ceiling effect.

Effectiveness Question 3: Compared to Non-Trained Teachers, Were Trained Teachers More Likely to Report Positive Changes in Students' Use of Technology?

The Teacher Survey also included items that assessed teachers' perceptions of their students' use of technology. For these items, teachers reported whether their students used a particular form of technology more frequently, in a more effective way, or both, comparing the 1995-1996 school year with the previous school year. There were eight items covering word processing, spreadsheets, data bases, graphics and design, telecommunications, multimedia technologies, presentation software, and curriculum-specific software (see Appendix D for specific examples accompanying the items). Positive changes in frequency and quality of use were reported for all items; and, with the exception of telecommunications, the most common response was "both," that is, both more frequent use *and* use in a more effective way.

Responses to all the student use items were coded as zero, representing the response "neither" (i.e., no change), or 1, representing positive change of any kind. Teachers who chose the response option "not applicable (inappropriate for my grade or students lack access)" were excluded. Thus, the basic data were percentages of teachers reporting positive change in student technology use, given that a change/no change judgment was made. Results were compared for teachers who participated in training during both years, one of the two years, or neither of the two years.

Access to technology is ignored in the analyses reported in this section. Although the training groups were associated with different levels of student access to computers, it was assumed that the difference in access was no greater in 1996 than it was in 1995. Hence, differing degrees of *change* in student use from 1995 to 1996 would be attributable to training. It might be argued that some teachers acquired one or more computers in 1995-1996, and that the new computer(s) not only increased student use but also prompted the teachers to participate in training. This argument invokes a situation in which the effects of increased student access and teacher training are inseparable, precluding any possibility of statistical control.

The evaluation question focused on the relationship between teacher training and reported change in students' use of technology, but with ten training topics and eight types of student use, there were

80 possible relationships. To simplify the analyses, specific *a priori* predictions were tested for five training topics, while for two other training topics, effects were tested for all eight types of student use, as described below. The three remaining topics were ignored in these analyses because participation rates were low or, in the case of "any other topic," results would not have been interpretable.

Integrating technology into instruction was the best-attended training activity for elementary teachers and the second best for secondary teachers over the two-year span. For this general topic, no predictions were made in advance about effects on student use. Any or all of the eight student uses of technology might be affected. Table 8 shows that, according to the teachers surveyed, five of the eight student uses were more likely to change in a positive direction when the teacher participated in technology integration training both years than when the teacher did not participate in such training. Specifically, two-year training participants reported positive change in student use of word processing, graphics/design, multimedia technologies, presentation software, and curriculum-specific software.

Another popular training topic was using technology to enhance personal productivity as a teacher. This kind of teacher training, like integrating technology, could affect any or all of the student uses. According to the specialists, productivity-enhancing technology such as gradebook programs often were the "hook" that piqued teachers' interest in using technology for instruction. Table 9 shows that teacher training was related to reported positive change in student uses of word processing, data bases, graphics/design, and multimedia technologies.

Two other training topics with high participation rates were the operational mechanics and basic software applications of Macintosh or *Windows* fundamentals and *ClarisWorks* or *Microsoft Office*. Six student use items were expected to differ as a function of teacher training on these topics: word processing, spreadsheets, data bases, graphics/design, multimedia technologies, and presentation software. As shown in Table 10, many of these predictions were confirmed. Both types of teacher training were associated with positive change in student use of graphics/design, multimedia technologies, and presentation software. In addition, positive change in student use of spreadsheets was related to teacher training in *ClarisWorks* or *Microsoft Office*, and positive change in student use of data bases was positively related to teacher training in Macintosh or *Windows* fundamentals. Neither type of training was related to students' word processing.

The remaining three training topics to consider are using multimedia technologies as an instructional tool, using telecommunications as an instructional tool, and presentation software. For these three topics, it was predicted that the corresponding form of student use would be enhanced by teacher training. The results presented in Table 11 show that two of the three predictions were confirmed. Positive changes in student use of telecommunications and presentation software were related to teacher training on these topics. Training on multimedia technologies had no measurable effect on student use; however, this may reflect the fact that the training focused on teacher use, not student use.

Discussion. An interesting feature of these data is that the one-year participant group did not differ from the non-participant group in any of the comparisons, whereas the two-year participant group often did. It may be that as a result of training, teachers first make greater use of technology themselves and only later permit or encourage their students to do so. Another interesting feature of the data is that, unlike teachers' use of technology, students' use of technology appears to be changing in positive ways without training intervention from the specialists. In Table 8 for example, the percents in the no training column range from 24 for data bases to 72 for word processing. These changes may reflect a number of factors including student use of computers in the home.

Teachers were not randomly assigned to training groups, so factors other than training may account for the student use results in Tables 8 through 11. The analyses of change in student use, unlike those for teacher use, did not control for the number of computers in the teacher's classroom. More importantly, student technology use was not observed directly, and the surveyed teachers were asked to rely on their memory of student use in the previous year. For these reasons, the student use data are best regarded as suggestive. A cautious conclusion might be stated as follows: If technology training produced positive changes in students' use of technology, these changes required two years to materialize.

Table 8
Technology Integration Training and Change in Student Technology Use

Type of Student Technology Use	Percent of Teachers Reporting Positive Change in Student Use		
	Teacher Participated in Training Two Years	Teacher Participated in Training One Year	Teacher Did Not Participate in Training
Word Processing	88*	79	72
Spreadsheets	53	23	29
Data Bases	47	19	24
Graphics/Design	91*	58	59
Telecommunications	56	31	45
Multimedia Technologies	85*	60	50
Presentation Software	81*	56	43
Curriculum-specific Software	84*	66	64

Note. Asterisks indicate a statistically significant difference in comparison to the non-trained group at $p < .05$. *N*s ranged from 19 to 42, from 32 to 68, and from 42 to 89 for the two-year, one-year, and zero-year participation groups, respectively.

Table 9
Teacher-Productivity-Enhancing Training and Change in Student Technology Use

Type of Student Technology Use	Percent of Teachers Reporting Positive Change in Student Use		
	Teacher Participated in Training Two Years	Teacher Participated in Training One Year	Teacher Did Not Participate in Training
Word Processing	93*	83	71
Spreadsheets	53	27	28
Data Bases	50*	19	22
Graphics/Design	83*	67	60
Telecommunications	60	48	39
Multimedia Technologies	88*	57	52
Presentation Software	76	46	53
Curriculum-specific Software	79	67	64

Note. Asterisks indicate a statistically significant difference in comparison to the non-trained group at $p < .05$. *Ns* ranged from 15 to 29, from 25 to 36, and from 54 to 120 for the two-year, one-year, and zero-year participation groups, respectively.

Table 10
Basic Software Application Training and Change in Student Technology Use

Type of Student Technology Use	Percent of Teachers Reporting Positive Change in Student Use					
	Teacher Participated in Training Two Years		Teacher Participated in Training One Year		Teacher Did Not Participate in Training	
	Claris/ MS Office	Mac/ *Windows*	*Claris/ MS Office*	Mac/ *Windows*	*Claris/ MS Office*	Mac/ *Windows*
Word Processing	83	84	77	78	77	76
Spreadsheets	71*	50	23	40	25	27
Data Bases	39	63*	29	32	22	18
Graphics/ Design	90*	94*	58	64	63	60
Multimedia Technologies	94*	93*	66	59	51	55
Presentation Software	89*	93*	58	53	48	50

Note. "*Claris*" is *ClarisWorks;* "*MS Office*" is *Microsoft Office*; "Mac/*Windows*" is Macintosh or *Windows* fundamentals. Asterisks indicate a statistically significant difference in comparison to the non-trained group at $p < .05$. For *Claris/MS Office*, *ns* ranged from 13 to 24, from 21 to 56, and from 58 to 102 for the two-year, one-year, and zero-year participation groups, respectively. For Mac/*Windows*, *ns* ranged from 8 to 19, from 20 to 45, and from 67 to 123 for the two-year, one-year, and zero-year participation groups, respectively.

Table 11
Multimedia, Telecommunications, and Presentation Software Training and Change in Student Technology Use

Type of Training and Student Technology Use	Percent of Teachers Reporting Positive Change in Student Use		
	Teacher Participated in Training Two Years	Teacher Participated in Training One Year	Teacher Did Not Participate in Training
Telecommunications	-73*	50	37
Multimedia Technologies	68	68	53
Presentation Software	100*	70	45

Note. Asterisks indicate a statistically significant difference in comparison to the non-trained group at $p < .05$. *Ns* ranged from 11 to 25, from 30 to 47, and from 71 to 89 for the two-year, one-year, and zero-year participation groups, respectively.

Conclusions and Recommendations

In conclusion, Pyramid Technology Training (PTT) has functioned effectively over the past two years as a comprehensive and adaptive, in-school technology training and technical support program. As documented in this report, PTT has moved beyond basic computer operation and software applications to address its objectives of improving teaching, learning, and school staff productivity. The data demonstrate that the program has met the diverse needs of school staff, and produced practical benefits for teachers, increasing their use of technology. In addition, the data suggest that students may have increased the frequency or effectiveness of their use of technology as a result of teacher training or in-class modeling by a specialist. These positive effects occurred despite limited availability of teachers for training and strong demands from school staff for non-training services. If these two constraints on program effectiveness were removed, even better results might be achieved.

Two recommendations are supported by the results of the evaluation. Administrators should seek ways of: (1) increasing the availability of teachers for training and their participation in training, especially at the secondary level; and (2) reducing schools' use of the specialists to provide non-training services — technical support, advising, and referral. The specialists have already responded, as best they could, to the challenges of limited teacher availability and demands for non-training services. They offered training after school, demonstrated technology use in classrooms, and taught school staff and students to solve their own technical problems whenever they could. Therefore the two recommendations imply a need for additional funds to hire substitute teachers and a technical support specialist for each pyramid.

Appendix A

Reporting Form for Time Allocation Estimates

Pyramid Technology Training Specialist's Estimated Allocation of Service Hours

Name _____ **Date** _____

Please complete the estimates below for the five work days immediately preceding today's date. Refer to the category definitions used previously in completing Service Records. Percents in each box should add to 100.

Estimated Allocation of Service Hours:

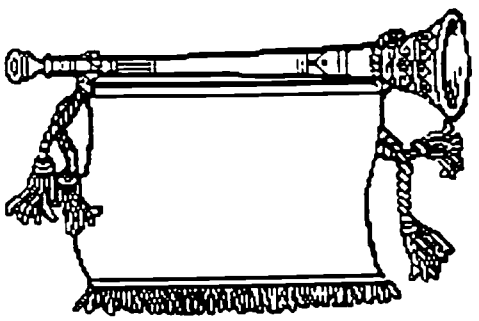
Service *in* Schools	___ %
Service to Schools	___ %
Other	___ %

Estimated Allocation of School Service Hours:

Staff and student development	___ %
Technical support	___ %
Advising	___ %
Linkage	___ %

Appendix B

Training Catalogs for Teachers



Announcing

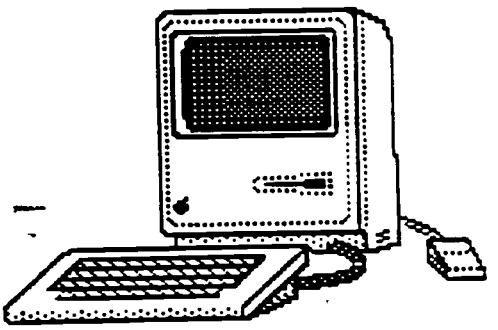
Area I Technology Training Sessions Spring 1996

The Area I Technology Training Specialists will be offering the sessions listed in this catalog to strengthen the integration of technology into the instructional program. To register for any of these sessions, call the Technology Training Specialist for your pyramid. Provide your name, the session title, a work number and location. If the session is listed twice on the same date please specify the location you would like to attend. All sessions will be filled on a first come, first serve basis. We will send you a confirmation notice in the pony.

RSVP

Irene Fitzgerald	Lee Pyramid	329-7865
Linda Gaudreault	Hayfield Pyramid	329-7983
Kelley Durham	Mt. Vernon Pyramid	329-1635
Tim Stahmer	West Potomac Pyramid	329-9452
Ernestine Meyer	Edison Pyramid	329-8539

ASAP!



ClarisWorks Graphics and Slide Show
February 5, 1996

Hayfield Secondary	3:00-4:30	L. Gaudreault/E. Meyer/I. Fitzgerald
Bucknell Elementary	2:00-3:30	T. Stahmer/K. Durham

This session will introduce participants to inserting graphics in a ClarisWorks document, where to find graphics, and how to create a slide show using a ClarisWorks draw document.

Prerequisite: Macintosh Fundamentals or equivalent experience

SWAT!
Student Workers Applying Technology
February 12, 1996

Area I Office	2:30-4:00	I. Fitzgerald/L. Gaudreault

Start SWAT teams at your school or in your classroom. Learn what it takes to start a student team of technology workers. Discover what you need to know to get your students involved in troubleshooting and peer training. Involve your students in the day to day management of your computers which will allow you to devote your time to more productive activities.

The Quicktake Camera
February 26, 1996

West Potomac	3:00-4:30	T. Stahmer/L. Gaudreault
Woodley Hills	2:00-3:30	K. Durham/E. Meyer/I. Fitzgerald

Learn to take high quality color pictures and load them into your Macintosh computer. This camera needs no film. This session will teach you how to take pictures, connect the camera to your computer and download the pictures to the computer. Learn to save the images and paste them into word processing documents.

Materials: Please bring a 3.5" formatted disk

Using A Scanner
March 4, 1996

Sandburg Middle	3:00-4:30	T. Stahmer/E. Meyer

In the session participants will learn how to use a scanner to digitize images and insert them into ClarisWorks documents using Ofoto software for the scanner. Useful tips on scanning resolutions, printing , saving files, and troubleshooting ideas will be discussed.

Prerequisite: Basic Macintosh skills
Materials: 3.5 inch disk and photos to be scanned

Using a Laserdisc Player, Level 1 and 2
March 4, 1996

Newington Forest Elem.	2:00-3:30	L. Gaudreault/K.Durham/I. Fitzgerald

Participants will learn how laserdiscs are better than a VCR. They will learn how to navigate through a laserdisc using the remote control. Participants will also learn how to use a Macintosh computer to control the laserdisc player and create presentations.

The One Computer Classroom
March 11, 1996

Franconia Elementary	2:00-3:30	E. Meyer/K. Durham
Newington Forest Elem	2:00-3:30	L. Gaudreault/K. Durham

Participants will be introduced to many strategies for teaching with one computer. Learn where to set up your computer, how to manage writing activities, cooperative learning, and administrative uses of the computer in your classroom.

Desktop Publishing
March 18, 1996

Edison High School	3:00-4:30	T. Stahmer/E. Meyer/K. Durham
Forestdale	2:00-3:30	I. Fitzgerald/L. Gaudreault

Working with a computer provides far more power than a typewriter. Word processing programs offer the ability to manipulate fonts, styles, graphics, and borders. This hands-on session is designed to introduce participants to the drawing module of ClarisWorks as a powerful desktop publishing tool.

Prerequisite: A basic understanding of ClarisWorks

First Class Client
Introducing the new FCPS Bulletin Board Software
March 25, 1995

Lee High School	3:00-4:30	I. Fitzgerald/L. Gaudreault
Anthony Lane	2:00-3:30	E. Meyer/T. Stahmer

The Fairfax Bulletin Board System is new and improved. Come see a demonstration of new software that allows you to "point and click" through communications.

Integrating Technology in the K-3 Classroom
April 15, 1996

Anthony Lane	2:00-3:30	E. Meyer/K. Durham

Have you ever wondered how to get 28 students to share 1-3 computers in your classroom? Or how to teach your whole class to use a software program? Or what to do if your students don't finish their work done on the computer? In this session you will learn numerous strategies to integrate technology into the elementary classroom.

Integrating Technology in the 4-6 Classroom
April 15, 1996

Silverbrook Elementary	2:00-3:30	L. Gaudreault/T. Stahmer

Participants will work through several strategies to integrate the Program of Studies with the tools of technology. The strategies include project-based learning, design briefs, and curriculum matrix. Teachers will be able to apply these strategies at every grade level.

Telecommunications Pen Pals
April 29, 1996

Hollin Meadows	2:00-3:30	T. Stahmer
Garfield Elem	2:00-3:30	I. Fitzgerald
Woodley Hills Elem	2:00-3:30	K. Durham
Anthony Lane	2:00-3:30	E. Meyer
William Halley	2:00-3:30	L. Gaudreault

Five technology specialists will simultaneously demonstrate the steps involved to establish a telecommunications pen pal.

Course An Introduction to HyperStudio **Time** 3:00 - 5:00

Audience All

Course # 1001 **Date** 3/4/96 **Location** Chapel Square - Mac Lab

Course Des.: Come and find out what the "hype" is all about. This session will provide you with an introduction to this powerful multimedia tool. You will see instructional possibilities for your classroom as well as create a mini stack of your own.

Prerequisite: Macintosh Fundamentals

Materials: 3.5 Floppy Disk **Instructors:** Judy Horn & Michael Cunningham

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Course Managing Computers in the Classroom **Time** 4:00 - 5:30

Audience K-8

Course # 1002 **Date** 1/24/96 **Location** Columbia - Library

Course Des.: Participants will be introduced a variety of strategies for teaching with classroom computers. The main components of this discussion based session include where to set up your computer. how to introduce the computer to your class. how to manage writing activities. cooperative learning, assessment. scheduling, and administrative uses of the computer in your classroom.

Prerequisite: None

Materials: None **Instructors:** Michael Cunningham & Judy Horn

Course SWAT (Student Workers Applying Technology) **Time** 3:00 - 4:30

Audience K-8

Course # 1003 **Date** 1/22/95 **Location** Poe Middle - Library

Course Des.: Start SWAT teams at your school or in your classroom. Learn what it takes to start a student team of technology workers. Discover what you need to know to get your students involved in troubleshooting and peer training. Involve your students in the day-to-day management of your computers which will allows more time for instructional activities.

Prerequisite: None

Materials: None **Instructors:** Michael Cunningham & Becky Daly

Course Managing Your FCPS Computer Inventory Using ClarisWorks **Time** 2:30 - 4:00

Audience All

Course # 1007 **Date** 2/12/96 **Location** Glen Forest ES - Computer Lab

Course Des.: Forced to complete your inventory? Now make the database work for you. Learn how to manipulate data to create impressive reports. sort for specific information (i.e. number of Macs. etc.). and print out only the information you want.

Prerequisite: Working knowledge of ClarisWorks. **(Not just familiarity)**

Materials: 3.5 Floppy Disk **Instructors:** Becky Daly & Vicki Herrington

---

Course Creating a ClarisWorks Slide Show **Time** 2:45 - 4:15

Audience K-8

Course # 1008 **Date** 4/15/96 **Location** Chapel Square - Mac Lab

Course Des.: Would you like to learn how to use the slide show feature of ClarisWorks to enliven your presentations? This session will provide you with the skills necessary to create your own ClarisWorks slide show.

Prerequisite: Working knowledge of integrating graphics into a ClarisWorks document.

Materials: 3.5 Floppy Disk **Instructors:** Judy Horn & Richard Washer

---

Course Internet: the Information Highway **Time** 4:15 - 5:45

Audience All

Course # 1009 **Date** 2/7/96 **Location** Jefferson HS

Course Des.: This session will introduce participants to the basics of the Internet. What exactly is it? How much do you need to know to be on the Internet? How do you access the "net"? What's there? What do you need to get there? How do you get there? How can you use the "net" as a resource? If your only exposure to the Information Highway has been in the headlines and in conversation with colleagues and friends. this session is designed for you.

Prerequisite: None

Materials: None **Instructors:** Richard Washer & Becky Daly

Course Buying a Computer for Home and Family **Time** 4:00 - 5:30

Audience All

Course # 1004 **Date** 2/28/96 **Location** Area II Office - Rm 6

Course Des.: The experience of purchasing a computer can be as frustrating and confusing as buying a car or a home. What do you need to know to make a smart purchase? This session will help you ask the right questions. both of yourself and the salesperson. Come with your questions and ideas and we will all work together in this discussion-based inservice to establish a process that will de-mystify the whole experience.

Prerequisite: None

Materials: None **Instructors:** Richard Washer & Judy Horn

Course Creating a Kid Pix Slide Show **Time** 4:00 - 5:30

Audience K-8

Course # 1005 **Date** 1/31/96 **Location** Glasgow MS - Computer Lab

Course Des.: Interested in having students put together a really cool electronic book report. an animated science project or an electronic comic strip? Participants will learn how to create a Kid Pix slide show.

Prerequisite: Working knowledge of Kid Pix

Materials: 3.5 Floppy Disk **Instructors:** Becky Daly & TBA

Course Teacher Productivity Using ClarisWorks **Time** 3:00 - 4:30

Audience K-8

Course # 1006 **Date** 2/5/96 **Location** Wakefield Forest - Comp. Lab

Course Des.: This hands-on session will allow participants to use ClarisWorks to increase teacher productivity. Participants will create labels. personalize student letters (mail merge) and share ideas to support home/school communications.

Prerequisite: Working knowledge of ClarisWorks.

Materials: None **Instructors:** Mike Cunningham & Vicki Herrington

Course A Sharing Session: Managing Technology **Time** 2:15 - 3:45

Audience K-6

Course # 1013 **Date** 2/26/96 **Location** Braddock Elem. - Library

Course Des.: Confused about how to integrate technology? Discuss with a panel of classroom teachers methods and techniques for implementing technology into your classroom. This session provides the opportunity to discuss and share instructional issues with classroom teachers who are successfully managing computers in the classroom.

Prerequisite: None

Materials: None **Instructors:** Michael Cunningham & Teacher Panel

---

Course Technology and Curriculum Integration **Time** 3:00 - 4:30

Audience K-8

Course # 1014 **Date** 4/11/95 **Location** Bailey's ES - Computer Lab

Course Des.: Many technology training sessions have come and gone with mixed successes and failures. Participants will learn how to effectively and efficiently integrate the use of technology. Presenters will share ideas, strategies, suggestions and templates developed for the classroom.

Prerequisite: None

Materials: None **Instructors:** Becky Daly & Michael Cunningham

---

Course Introduction to Microsoft Windows 3.1/Windows for Workgroups **Time** 3:00 - 4:30

Audience All

Course # 1015 **Date** 2/8/96 **Location** Woodson H.S. - Room 34

Course Des.: This course is designed for the DOS user who is moving to a Windows environment. No longer will you need to remember keystrokes to perform certain tasks. Microsoft Windows provides a graphical interface that allows you to point and click on menus and commands for document formatting and file management.

Prerequisite: Access to Microsoft Windows 3.1/Windows for Workgroups

Materials: 3.5 Floppy Disk **Instructors:** Vicki Herrington & Richard Washer

Course Telecommunications: Beyond E-Mail **Time** 4:15 - 5:45

Audience All

Course # 1010 **Date** 3/12/96 **Location** Jefferson HS

Course Des.: One of the most popular uses of the VA-Pen BBS is E-Mail. In addition. VA-PEN offers such features as forums for discussions. pavilions. on-line chat groups and more. This session will explore some of these options as well as ways of establishing pen-pal relationships with other local and international students and staff.

Prerequisite: Access to a modem.

Materials: None **Instructors:** Richard Washer & Vicki Herrington

---

Course Mail Merge Using Microsoft Word **Time** 3:00 - 4:30

Audience All

Course # 1011 **Date** 3/25/95 **Location** Chapel Square - Windows Lab

Course Des.: Let Microsoft Word help you be more productive. Word makes it easy to produce personalized letters. You will also learn to create and print mailing labels--a wonderful time saver for busy people. Microsoft Word is part of the Microsoft Office Suite. Each school received at least one copy of Microsoft Office last year.

Prerequisite: Basic working knowledge of Windows and Microsoft Word.

Materials: 3.5 Floppy Disk **Instructors:** Vicki Herrington & Judy Horn

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Course Overview of Microsoft Office PowerPoint Wizards **Time** 3:00 - 4:30

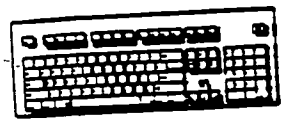
Audience Admin.

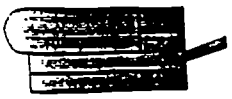
Course # 1012 **Date** 3/4/96 **Location** Chapel Square - Windows Lab

Course Des.: PowerPoint is a popular presentation package used in today's business and academic worlds. Learn to use color and graphics to make your presentations more effective and interesting. Give your presentation a custom look and let PowerPoint do the formatting.

Prerequisite: Basic working knowledge of Windows and Microsoft Word.

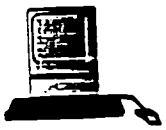
Materials: 3.5 Floppy Disk **Instructors:** Vicki Herrington & Becky Daly




Area III Technology Training Catalog

Spring 1996

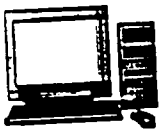



The Area III Technology Training Specialists are offering the following sessions to enhance the integration of technology into the instructional program.

Registration Information

To register call 204-3878 and remember to...

- **give your whole name and spell your last name**
- **provide the session number and title**
- **provide your work number and location**



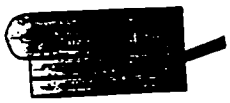




- All sessions will be filled on a first come, first served basis.
- Be sure you meet the prerequisite skills before registering for a session.
- Participants will receive a confirmation letter two weeks prior to your session date.


- Call to cancel your registration as soon as you know you are not able to attend the class!
- Classes with low attendance may be canceled at the discretion of the instructor. You will be notified if your session is canceled.


- Participants will receive a certificate of attendance.

Course ABC's of Macintosh **Time** 2:15 -3:45

Audience All

Course # 1016 **Date** 4/18/96 **Location** Chapel Square - Mac Lab

Course Des.: Learn how to use the Macintosh. Desktop navigation, file management, printing and customizing the Macintosh will be the focus of this session. Those new to the Macintosh or other users seeking to perfect their skills are encouraged to attend.

Prerequisite: None

Materials: None **Instructors:** Judy Horn & Richard Washer

Surfing the Internet

Time: 3:00-5:00 Level: K-12

Register for one or more sessions:

Session 204	Friday, February 9	Herndon HS
Session 206	Friday, February 23	Cooper MS
Session 208	Friday, March 1	Herndon HS
Session 209	Monday, March 11	Herndon HS
Session 210	Friday, April 12	Cooper MS
Session 212	Friday, April 19	Cooper MS
Session 214	Friday, April 26	Herndon HS

If you are looking for open lab time to explore the Internet on your own, this session is for you. There is room for 20 "surfers", so do not hesitate! Come with your own agenda, questions, and blank disks for capturing electronic "loot".

Prerequisite: None

Instructors: Tim Fish or Bob Maffett

Materials: 3.5" HD disks

Creating a Home Page on the Internet

Time: 4:15-5:45 Level: K-12

Session 211	**Tuesday, April 16**	**Cooper MS**
(3 Session Course)	**Tuesday, April 23**	**Cooper MS**
	Tuesday, April 30	**Cooper MS**

Come see how easy it is to publish on the World Wide Web! This multi-session course will teach you how to create your own home page and become comfortable browsing the Internet.

#1 Browsing the Internet

April 16

Participants will learn to browse the Internet using Netscape, a software program which makes using the Internet easy. Participants will make note of interesting sites they will have linked to their home page.

#2 Creating Your Own Home Page

April 23

Participants will create their own home page. They will learn to write their text, import and convert their graphics, and have their home page linked to other sites on the Internet.

#3 Publishing Your Home Page

April 30

Participants will learn to upload their home page to the VA-Pen server in Richmond that will make it accessible on the Internet.

Prerequisite: VA-Pen account

Instructors: Elizabeth Rossini — Mike Rutherford

Materials: Two 3.5" HD disks

Creating a Home Page for Classroom Use

Time: 4:00-5:30 Level: K-12

Session 202 Wednesday, January 31 Cooper MS

Have you considered using the Internet with your students but are unsure how to make it work in your classroom? This session will teach participants how to create a "home page" with hypertext markup language (HTML).

Prerequisite: Some knowledge of Netscape

Materials: One 3.5" HD disk

Instructor: Bob Maffett

Introduction to the Internet

Time: 4:00-5:30 Level: K-12

Session 203 Wednesday, February 7 Westbriar ES

This is a session for beginners who want some basic information about the Internet and its instructional applications. The presenter will share real life experience with using the Internet in elementary classrooms.

Prerequisite: None

Materials: None

Instructors: Joanne Goodwin — Bob Maffett

First Class BBS-The New FCPS BBS Software

Time: 4:00-5:30 Level: K-12

Session 205 Tuesday, February 13 Flint Hill ES

The Fairfax Bulletin Board System is new and improved. Come see a demonstration of the new software that allows you to "point and click" through communications. Participants will leave with a copy of the new software that is ready to install at home or in your classroom.

Prerequisite: None

Materials: One 3.5" HD formatted Macintosh disk

Instructor: Tim Fish

SWAT: Student Workers Applying Technology

Time: 3:00-4:30 Level: K-8

Session 215 Monday, February 26 Westgate ES

Start SWAT teams at your school or in your classroom! Learn the advantages and what it takes to start a student team of technology workers. Discover what is needed to know to get students involved in troubleshooting and peer training. Involve students in the day-to-day management of classroom or lab computers.

Prerequisite: Willingness to start a SWAT program in your school

Materials: None

Instructor: Kathy Manley

Producing a Daily News Program

Time: 3:00-4:30 Level: K-6

Session 219 Monday, March 11 Kent Gardens ES

This session provides participants with an overview of the process necessary to create a daily or weekly news broadcast in their schools.

Prerequisite: None

Materials: One 3.5" HD Macintosh formatted disk Instructors: Sheryl Czepluch — Kathy Manley

Using a Scanner

Time: 4:00-5:30 Level: K-12

Session 221 Thursday, February 1 Herndon HS

Participants will use a scanner to digitize photos, line drawings, etc., and insert them into ClarisWorks documents, using Ofoto software for the scanner. Useful tips on how to connect the scanner, change scanning resolution, and printing and saving of files will be introduced. Troubleshooting ideas will also be shared.

Prerequisite: Basic Macintosh skills

Materials: Photos or art to be scanned, one 3.5" HD Macintosh formatted disk Instructor: Barry Reddish

EXAMBANK- Test Writing Software for the IBM

Time: 3:00-4:30 Level: 7-12

Session 222 Monday, February 26 Madison HS

This workshop will expose participants to the test-writing program entitled EXAMBANK. Participants will have hands-on experience and be able to install it on their own machines at work and at home. EXAMBANK will allow participants to make different copies of the same test and easily archive the tests for future updates.

Prerequisite: Access to an IBM compatible computer and printer

Materials: 3.5" or 5.25" DOS formatted disk Instructor: Mike Rutherford

Windows Basics

Time: 3:00-4:30 Level: K-12

Resister for either session:

Session 223 Monday, April 15 Langley HS

Session 224 Tuesday, April 16 Langley HS

This session will provide participants with an introduction to the basic operations of Microsoft Windows 3.1. The following skills will be taught: manipulating Windows, using the program manager, and using the file manager.

Prerequisite: None

Materials: None Instructors: Tim Fish — Bob Maffett

Capture Some Fun with the Quick Take Camera

Time: 4:00-5:30 Level: K-12

Session 217 Tuesday, February 13 Louise Archer ES

Going on a field trip? Producing a play? Hosting an international festival? Capture some of these special moments with the camera and include them in a newsletter, special report, or presentation. Learn to use the QuickTake camera to transfer pictures to disk and into ClarisWorks documents.

Prerequisite: Understanding of ClarisWorks word processor

Materials: One 3.5" HD Macintosh formatted disk Instructor: Elizabeth Rossini

Connecting and Using Your A/V Macintosh

Time: 3:00-4:30 Level: K-12

Session 216 Monday, February 5 Madison HS

This session is designed to provide participants with the skills needed to connect an A/V Macintosh to a VCR and other peripherals. The nuts and bolts of cabling to the different A/V models will be emphasized, and a discussion and demonstration of the technical capabilities of A/V technology will be conducted.

Prerequisite: Macintosh Basics or equivalent experience

Materials: One 3.5" HD Macintosh formatted disk Instructors: Steve Holmlund — Tim Fish

Using Apple Video Player with Your A/V Mac

Time: 3:00-4:30 Level: K-12

Session 218 Monday, March 4 Madison HS

After attending this session, participants will be able to use Apple Video Player software to capture still images and film clips from a VCR, laserdisc, or TV and incorporate them into presentations. The session will also include techniques for capturing still images from digital cameras, scanners, and CD-ROMs. Using the Apple Presentation System, computer presentations can be displayed on a large-screen monitor or saved to videotape.

Prerequisite: Macintosh Basics or equivalent experience

Materials: One 3.5" HD Macintosh formatted disk Instructors: Steve Holmlund — Tim Fish

Create Multimedia Presentations with A/V Mac

Time: 3:00-4:30 Level: K-12

Session 220 Monday, April 8 Madison HS

The focus of this session will be on the instructional design of multimedia presentations given the extra capabilities of A/V technology. Teacher and student examples emphasizing the integration of multimedia into the FCPS Program of Studies will be shared. During this session participants will have guided hands-on experience in multimedia design.

Prerequisite: Macintosh Basics or equivalent experience

Materials: One 3.5" HD Macintosh formatted disk Instructors: Steve Holmlund — Tim Fish

New Mac City

Time: 4:00-5:30 Level: K-12

Session 228 Thursday, February 15 Aldrin ES

This session is designed to help beginner and novice users become familiar with the Macintosh operating system. Participants will learn to use the pull down menus, use the keyboard to navigate the desktop, create new folders, switch between multiple applications, format and save to disk, and troubleshoot the system folder.

Prerequisite: None

Materials: None

Instructor: Barry Reddish

Macintosh Magical Mystery Tour

Time: 4:00-5:30 Level: K-12

Session 229 Wednesday, February 21 Aldrin ES

This session is designed for novice and intermediate Macintosh users who want to become power users. Topics covered will include file sharing, memory, extensions, control panel management, and troubleshooting system crashes.

Prerequisite: Macintosh Basics

Materials: None

Instructor: Barry Reddish

Macintosh Troubleshooting

Time: 3:00-4:30 Level: K-12

Register for either session:

Session 213 **Monday, March 4** **Herndon MS**

Session 231 **Wednesday, April 17** **Herndon MS**

Do you frequently stare at the blinking question mark or the sad Macintosh icon and don't know what to do? Then this class is intended to give you the knowledge you need to resurrect your Macintosh to full operating condition! Topics covered include: using MacCheck diagnostic, Disk First Aid, Hard Disk formatting, and system software reinstallation.

Prerequisite: None

Materials: None

Instructors: Barry Reddish — Kathy Manley

Making You and Your Macintosh Happy

Time: 4:00-5:30 Level: K-12

Session 230 **Tuesday, March 12** **Thoreau MS**

(3 session course) **Tuesday, March 19**

Tuesday, March 26

This series of classes was designed with the novice Macintosh user in mind. Come learn Macintosh basics. Skills covered will include learning Apple Menu Items, navigating around the Macintosh, saving to a specified location, cutting / pasting, copying, etc. Participants are expected to attend all three sessions as skills taught in each successive session will build upon those taught in previous sessions.

Prerequisite: None

Materials: One 3.5" HD Macintosh formatted disk

Instructor: Kathy Manley

Introduction to DOS

Time: 3:00-4:30 Level: K-12

Session 225 Monday, April 22 Langley HS

This session will provide participants with an introduction to the basic operations of DOS. The following skills will be taught: creating and deleting directories, navigating through directories, looking at contents of directories, and copying and moving files.

Prerequisite: None

Materials: None Instructors Tim Fish — Bob Maffett

Introduction to HyperCard

Time: 3:00-4:30 Level: 7-12

Session 226 Tuesdays, February 6 Madison HS
(5 session course) February 13
February 20
February 27
March 5

Participants will be introduced to the popular authoring program, HyperCard, for the Macintosh. At the end of the sessions, participants will be able to create interactive programs and be provided with strategies and classroom ideas using HyperCard. Participants are expected to attend all five sessions as skills taught in each successive session will build upon those taught in previous sessions.

Prerequisite: Basic Macintosh Skills

Materials: One 3.5" HD Macintosh formatted disk Instructor: Mike Rutherford

HyperStudio

Time: 4:00-5:30 Level: K-12

Session 227 Wednesdays, February 28 Longfellow MS
(5 session course) March 6
March 13
March 20
March 27

HyperStudio is a wonderful multimedia tool for both students and teachers. Participants will focus on learning basic HyperStudio stack design and how to add graphics, sound, text, buttons, and animations. Also, participants will explore ways to import both still and video images from several different sources. Participants are expected to attend all five sessions as skills taught in each successive session will build upon those taught in previous sessions.

Prerequisite: Basic Macintosh skills or Windows Fundamentals

Materials: 3.5" HD Macintosh formatted disks Instructors: Kathy Manley — Bob Maffett

ClarisWorks Drawing: Intermediate Skills

Level: K-12

Register for only one session:			
Session 241	Monday, March 18	Langley HS	3:00 - 4:30
Session 242	Thursday, March 21	Marshall HS	4:00 - 5:30
Session 243	Monday, May 6	Forestville ES	4:00 - 5:30

This session will focus on the more advanced features of the ClarisWorks drawing module. The following skills will be taught:

- Working with text boxes
- Adding clip art to a drawing document
- Aligning objects
- Grouping and ungrouping documents
- Adding pages to a drawing document
- Applying rulers to a drawing document
- Turning the Autogrid off
- Duplicating a drawing object

Prerequisite: Macintosh Basics or equivalent

Materials: One 3.5" HD Macintosh formatted disk Instructor: Tim Fish or Elizabeth Rossini or Steve Holmlund

ClarisWorks Drawing: Advanced Skills

Level: K-12

Register for only one session:			
Session 244	**Monday, March 25**	**Langley HS**	**3:00 - 4:30**
Session 245	**Thursday, March 28**	**Marshall HS**	**4:00 - 5:30**
Session 246	**Monday, May 13**	**Forestville ES**	**4:00 - 5:30**

This session will focus on the advanced features of the ClarisWorks drawing module. Guided practice time will be provided for all participants. The following skills will be taught:

- Viewing a ClarisWorks document as a slide show
- Locking and unlocking drawing objects
- Using frame links

Prerequisite: An intermediate understanding of the ClarisWorks drawing module

Materials: One 3.5" HD Macintosh formatted disk Instructor: Tim Fish or Elizabeth Rossini or Steve Holmlund

ClarisWorks 4.0: Conversions & Features

Time: 4:00-5:30 **Level: K-12**

Session 249 **Monday, January 29** **Forestville ES**

Participants in this session will explore new features found in version 4.0 of ClarisWorks. These include new clip art, outline, database, drawing capabilities, and the concept of "stylesheets". File conversion from earlier ClarisWorks versions will be demonstrated and practiced. The conversion will be available for copying.

Prerequisite: Fundamental skills with ClarisWorks

Materials: One 3.5" HD Macintosh formatted disk Instructor: Steve Holmlund

ClarisWorks Word Processing: An Introduction

Level: K-12

Register for only one session:

Session 232	Monday, February 12	Langley HS	3:00 - 4:30
Session 233	Thursday, February 29	Marshall HS	4:00 - 5:30
Session 234	Monday, April 15	Forestville ES	4:00 - 5:30

This session will focus on the basic operations of ClarisWorks word processing. The following skills will be taught:

- Changing the font, style, and size of text
- Editing text using cut, copy, paste, and the spell checker
- Saving documents on the hard drive and floppy disk

Prerequisite: Macintosh Basics or equivalent

Materials: One 3.5" HD Macintosh formatted disk Instructor: Tim Fish or Elizabeth Rossini or Steve Holmlund

ClarisWorks Word Processing: Applications

Level: K-12

Register for only one session:

Session 235	Monday, February 26	Langley HS	3:00 - 4:30
Session 236	Thursday, March 7	Marshall HS	4:00 - 5:30
Session 237	Monday, April 22	Forestville ES	4:00 - 5:30

This session will focus on the more advanced features of ClarisWorks word processing. The following skills will be taught:

- Working with headers and footers
- Setting margins and tabs
- Creating and saving stationery files
- Importing graphics into a document
- Inserting floating text boxes
- Creating a document with multiple columns
- Using the thesaurus

Prerequisite: Macintosh Basics and ClarisWorks Fundamentals or equivalent

Materials: One 3.5" HD Macintosh formatted disk Instructor: Tim Fish or Elizabeth Rossini or Steve Holmlund

ClarisWorks Drawing: The Fundamentals

Level: K-12

Register for only one session:

Session 238	Monday, March 11	Langley HS	3:00 - 4:30
Session 239	Thursday, March 14	Marshall HS	4:00 - 5:30
Session 240	Monday, April 29	Forestville ES	4:00 - 5:30

This session will focus on the basic operational skills of the ClarisWorks drawing module. The following skills will be taught:

- Exploring the functions of each drawing tool
- Using the arrange menu to move objects between layers
- Using the drawing tools to create graphics that can be added to word processing documents

Prerequisite: Macintosh Basics or equivalent

Materials: One 3.5" HD Macintosh formatted disk Instructor: Tim Fish or Elizabeth Rossini or Steve Holmlund

ClarisWorks Spreadsheets

Time: 3:00-4:30 Level: K-12

Register for either session:

Session 254	Thursday, February 29	Langley HS
Session 257	Thursday, March 7	Langley HS

Participants in this two part course will learn how to use and create spreadsheets. The first session will focus on using and manipulating information in pre-made spreadsheets. The second session will focus on how to create an original spreadsheet.

Prerequisite: Working knowledge of ClarisWorks

Materials: One 3.5" HD Macintosh formatted disk

Instructor: Tim Fish

Databases for Elementary School Teachers

Time: 4:00-5:30 Level: K-6

Register for either session:

Session 262	**Tuesday, April 23**	**Langley HS**
Session 263	**Tuesday, April 30**	**Langley HS**

Participants in this two part course will learn how to use and create databases. The first session will focus on using and manipulating information in pre-made databases. The second session will focus on how to create an original database.

Prerequisite: Working knowledge of ClarisWorks

Materials: One 3.5" HD Macintosh formatted disk

Instructors: Kathy Manley — Tim Fish

Teaching Graphing and Charting Using ClarisWorks

Time: 3:00-4:30 Level: K-12

Session 258 **Monday, March 11** **Aldrin ES**

This session shares strategies on how to teach students graphing and charting information using ClarisWorks. Types of graphs and charts discussed include bar, area, line, pie, and pictograms. Participants will learn the skill of incorporating graphs and charts into word processing documents.

Prerequisite: None

Materials: None

Instructors: Mike Rutherford — Elizabeth Rossini

Using ClarisWorks in the HS Social Studies Curriculum

Time: 3:00-4:30 Level: 9-12

Register for either session:

Session 250	Tuesday, February 6	Herndon HS
Session 260	Tuesday, February 13	Langley HS

This session will combine discussion, demonstration, and hands-on exploration of ClarisWorks applications tailored specifically for HS Social Studies teachers. Teacher productivity files including test construction, grade book, outline, and calendar templates will also be shared. Files used during the session will be given to participants.

Prerequisite: None

Materials: One 3.5" HD Macintosh formatted disk

Instructor: Barry Reddish — Steve Holmlund

Using ClarisWorks in the HS Science Curriculum

Time: 3:00-4:30 Level: 9-12

Register for either session:

Session 252	Monday, February 12	Marshall HS
Session 264	Wednesday, March 13	Herndon HS

This session will combine discussion, demonstration, and hands-on exploration of ClarisWorks applications tailored specifically for high school science teachers. Biology, chemistry and physics curricula will be addressed via teacher-created files and templates available to session participants. Teacher productivity files including test construction, grade book, outline, and calendar strategies will be shared. Files used during the session will be given to participants.

Prerequisite: None

Materials: One 3.5" HD Macintosh formatted disk

Instructor: Bob Maffett — Steve Holmlund

Using ClarisWorks GRAPHICS

Time: 4:00-5:30 Level: K-12

Session 253 Tuesday, February 20 Sunrise Valley ES

Participants will each have their own Mac computer for this hands-on session explaining tips on adding graphics to documents. Participants will learn how to select graphics from a variety of sources including using the "Flash-It" shareware utility and how to place, move, resize, layer, group, etc., graphics in ClarisWorks documents.

Prerequisite: Familiarity with the Macintosh

Materials: Two 3.5" HD Macintosh formatted disks

Instructors: Peg Sud — Bob Maffett

Integrating Technology In the K-3 Classroom

Time: 4:00-5:30 Level: K-3

Register for either session:

Session 267	Tuesday, February 20	Forestville ES
Session 272	Wednesday, March 20	Lemon Road ES

Have you ever wondered how to get 28 students to share 1-3 computers in the classroom? Or how to teach your whole class to use a software program? Or what to do if your students don't finish their work done on the computer? If you've answered yes to any of those questions, this is the session for you! You will learn numerous strategies to integrate technology into the elementary classroom. A collection of ClarisWorks templates will be shared.

Prerequisite: None

Materials: One 3.5" HD Macintosh-formatted disk

Instructors: Elizabeth Rossini — Mike Rutherford

Software Preview at the ITS Lab

Time: 2:30-4:00 Level: K-8

Register for only one session:

Session 268	Friday, February 23	Dunn Loring Center
Session 273	Friday, March 29	Dunn Loring Center
Session 275	Friday, April 26	Dunn Loring Center

Up to eight participants per session are invited for an informal preview of available Macintosh software. Integrated Technology Services, the special education branch of the FCPS technology initiative, houses one of the few software preview labs in FCPS and has graciously offered their facility to Area III staff. Participants will be assisted in locating software and CD-ROMS applicable for instructional use.

Prerequisite: Macintosh Basics

Materials: None

Instructor: Steve Holmlund

Teaching Strategies in a Computer Lab Setting

Time: 4:00-5:30 Level: K-12

Session 271 Wednesday, March 6 Thoreau M S

This session gives participants strategies to effectively teach in a computer lab setting. The importance of modeling is stressed (and modeled in the teaching). Topics will include managing time, engaging "challenging" students, managing a printer, and saving students' work so they can later find it!

Prerequisite: None

Materials: Access to any computer lab

Instructor: Mike Rutherford

Using ClarisWorks in the High School English Curriculum

Time: 3:00-4:30 Level: 9-12

Register for either session:

Session 256	Tuesday, March 5	Langley HS
Session 259	Monday, March 18	Herndon HS

This session will combine discussion, demonstration, and hands-on exploration of ClarisWorks applications tailored specifically for HS English teachers. Teacher productivity files including test construction, gradebook, outline, and calendar templates will be shared. Files used during the session will be given to participants.

Prerequisite: None
Materials: One 3.5" HD Macintosh formatted disk

Instructors: Steve Holmlund — Barry Reddish

Claris Databases

Time: 4:00-5:30 Level: K-12

Session 261 Wednesday, March 20 Hutchison ES

The use of databases is a wonderful way to integrate technology into the curriculum. This session will consist of two parts: first, the participants will manipulate previously created databases using the find and sort commands. Second, the participants will create a basic database to practice the skills of defining fields and changing layouts.

Prerequisite: Basic Macintosh skills

Materials: One 3.5" HD Macintosh formatted disk

Instructor: Barry Reddish

Tips on Buying Computers

Time: 4:00-5:30 Level: K-12

Session 265 Tuesday, March 12 Area III Office

Buying a computer for school or home can be a frustrating and confusing experience. This discussion-based inservice will give you the tools you need to confidently understand the complicated computer jargon to make informed decisions.

Prerequisite: None
Materials: Bring newspaper and magazine advertisements

Instructors: Elizabeth Rossini — Tim Fish

Student Presentations: From Research to Production

Time: 4:00-5:30 Level: K-8

Session 266 Tuesday, February 20 Flint Hill ES

This session will combine discussion, demonstration, and hands-on exploration of the following:

- Research sources of information and images (CD-ROM, Laserdiscs, Software, the Internet)
- Techniques for image capture and insertion into presentations
- Comparison of presentation software for students (Kid Pix, HyperStudio, ClarisWorks)
- Tips for storyboarding, group collaboration, and crediting sources

Prerequisite: Macintosh Basics

Materials: One 3.5" HD Macintosh formatted disk

Instructors: Steve Holmlund — Tim Fish

Using a Computer to Make a Teacher's Life Easier

Time: 4:00-5:30 Level: K-12

Session 274 Wednesday, April 17 Cunningham Park ES

This session will provide participants with many ideas to make their lives easier as professionals. Strategies will include keeping grades using spreadsheets and grade programs, using mail merges for personalized communication, and organizing the classroom using a database. Other ideas include creating your own letterhead, substitute plans, and templates for class newspapers, lesson plans, and memos. A collection of ClarisWorks templates will be shared.

Prerequisite: A willingness to try new strategies

Materials: One 3.5" HD Macintosh formatted disk

Instructors: Elizabeth Rossini — Mike Rutherford

Computer Viruses: Should You Be Worried?

Time: 4:00-5:30 Level: K-12

Session 276 Wednesday, May 1 James Madison HS

Computer viruses are not a problem if you are properly prepared! This session will teach participants to be virus aware, scan computers (IBM and Macintosh) for viruses, and "clean" the computer if a virus is found. Participants will also learn how to set up their computer to watch for viruses.

Prerequisite: None

Materials: One 3.5" HD Macintosh formatted disk
One 3.5" HD DOS formatted disk

Instructor: Mike Rutherford

Macintosh Shareware

Time: 4:00-5:30 Level: K-12

Session 269 Tuesday, February 27 Sunrise Valley ES

Participants will each have their own Mac computer for this hands-on session on inexpensive Mac educational shareware for grades 1-6. Everyone will get to use and keep the teacher's favorite 20 Mac educational shareware programs chosen to expand student learning opportunities. An illustrated handout will describe all programs.

Prerequisite: Familiarity with the Macintosh

Materials: Two 3.5" HD Macintosh formatted disks

Instructors: Peg Sud — Bob Maffett

Appendix C

Training Catalog for Administrators

Spring 1996

AREA III STAFF

Area III

Catalog for Technology Training

The Area III Technology Training Specialists are offering the following sessions to enhance the integration of technology into the administrative operations of your school.

Registration Information

To register call 204-3878 and remember to...

-give your whole name and spell your last name
-provide the session number and title
-provide your work number and location

- All sessions will be filled on a first come, first served basis.

-Be sure you meet the prerequisite skills before registering for a session.

-Participants will receive a confirmation letter two weeks prior to your session date.

-Call to cancel your registration as soon as you know you are not able to attend the class!

-Classes with low attendance may be canceled at the discretion of the instructor. You will be notified if your session is canceled.

-Participants will receive a certificate of attendance.

Windows Basics

Time: 3:00 - 5:30

Session 280	Monday, February 12	Crossfield Elementary School
Session 281	Monday, March 25	James Madison HS

Participants will be introduced to using Windows 3.1/3.11. In this session topics will include working with Windows, creating icons and groups, launching applications and customizing the control panels. Tips on connecting peripherals such as printers and modems will also be discussed.

Prerequisite: None

Materials: None

Instructors: Bob Maffett — Dennis Nelson

Windows Intermediate

Time: 9:30 - 11:30

Session 282	Wednesday, April 10	Chapel Square Center

Participants will learn about the File Manager including, finding files, creating directories, and troubleshooting common Windows problems. This session concentrates on using the File Manager to organize your documents. Topics will include: moving and deleting files on your hard drive and floppy disks and creating directories. Participants will also be provided with tips on troubleshooting common Windows problems.

Prerequisite: None

Materials: None

Instructors: Bob Maffett — Dennis Nelson

MS-Word: Making the Transition from WordPerfect

Time: 3:30 - 6:00

Session 283	Monday, February 26	South Lakes HS
Session 284	Wednesday, April 17	Madison HS

Do you know WordPerfect and wonder if you should invest time and energy to learn MS-Word? If you want to make the transition, this session is for you! Important features of Word that can enhance any administrative office will be shared. This session will also enable you to create basic word processing documents.

Prerequisite: Basic Widows skills

Materials: One 3.5" HD disk

Instructors: Bob Maffett — Clay Sande

MS-Word: Presenting Data with Tables and Charts

Time: 3:30 - 5:30

Session 285	Monday, March 4	South Lakes HS
Session 286	Wednesday, April 24	Madison HS

Do you need to communicate data to staff and/or parent groups? Do you want to include tables and charts in your PowerPoint presentations? This session will teach you how to create tables to organize data, perform calculations, and display graphs/charts.

Prerequisite: Currently use MS-Word for basic word processing

Materials: One 3.5" HD disk

Instructor: Bob Maffett — Clay Sande

MS-Word: Advanced Skills

Time: 1:00 - 3:00

Session 287 Monday, May 6 Chapel Square Center

Are you ready to unleash the power of Microsoft Word? This session will teach you how to customize the program by creating macros, templates, and graphic effects. It will also teach you to use *Wizards*, *Auto Correct*, and *AutoFormat*.

Prerequisite: Currently use MS-Word for basic word processing

Materials: One 3.5" HD disk

Instructor: Tim Fish — Mike Rutherford

MS-Excel: Introduction

Time: 3:30 - 6:00

Session 288	Monday, March 18	South Lakes HS
Session 289	Wednesday, May 1	Madison HS

If you need to work with budgets or plan "what if" scenarios, you may find a spreadsheet program helpful. This session will enable you to begin using Excel to generate basic spreadsheets.

Prerequisite: Basic Windows skills

Materials: One 3.5" HD disk

Instructors: Bob Maffett — Tim Fish

MS-PowerPoint: Introduction

Time: 3:30 - 6:00

Session 290	Thursday, March 7	South Lakes HS
Session 291	Wednesday, April 8	Madison HS

Do you want to use PowerPoint to enhance your own presentations just as Dr. Webb does? This session will provide an overview of the many features of PowerPoint and teach you how to create your own dynamic presentation.

Prerequisite: Basic Windows Skills

Materials: Two 3.5" HD disks

Instructors: Bob Maffett — Harriet Hopkins
Dennis Nelson
John Tozzi

MS-PowerPoint: Customizing Your Presentation

Time: 9:30 - 12:00

Session 292 Wednesday, April 24 Chapel Square Center

Do you want to add pizzaz to your PowerPoint presentations? This session will teach you how to add tables, customize styles, and work with builds and transitions.

Prerequisite: Some experience with PowerPoint

Materials: One 3.5" HD disk

Instructors: Elizabeth Rossini — Kathy Manely

Internet-What You Need to get Access

Time: 9:00 - 11:00

Session 293 Tuesday, February 27 Area III Office Assembly Room
Assembly Room

Have you considered getting Internet access in your school or home.? Participants will leave with an understanding of the hardware and software required to get connected to the Internet.

Prerequisite: None

Materials: None

Instructors: Kathy Manley — Bob Maffett

Introduction to the Internet

Time: 9:30 - 11:30

Session 294 Monday, March 11 Chapel Square Center

This session is for beginners who want some basic information about the Internet and its instructional applications. Participants will learn to navigate the Internet using a software program called Netscape. Educational applications of the Internet will be addressed.

Prerequisite: None

Materials: None

Instructors: Steve Holmlund — Elizabeth Rossini

Internet Surf Time

Time: 3:00 - 5:00

Register for one or more sessions:		
Session 204	Friday, February 9	Herndon HS
Session 206	Friday, February 23	Cooper MS
Session 208	Friday, March 1	Herndon HS
Session 209	Monday, March 11	Herndon HS
Session 210	Friday, April 12	Cooper MS
Session 212	Friday, April 19	Cooper MS
Session 214	Friday, April 26	Herndon HS

If you are looking for open lab time to explore the Internet on your own, this session is for you. There is room for 20 "surfers", so do not hesitate. Come with your own agenda, questions, and blank disks for capturing electronic "loot".

Prerequisite: None

Materials: 3.5" HD disks

Instructors: Tim Fish or Bob Maffett

Publishing Home Pages on the Internet: *What you need to know*

Time: 10:00 - 12:00

Session 295 Tuesday, March 19 Area III Office Assembly Room

If you are interested in learning about home pages and their educational uses come to this session! Topics will include: what are home pages, educational uses, and security and maintenance issues of the Internet. Examples of FCPS and other educational home pages will be viewed.

Prerequisite: None

Materials: None

Instructors: Mike Rutherford Elizabeth Rossini

Great Internet Sites for Administrators

Time: 9:30 - 11:30

Session 296 Thursday, March 21 Chapel Square Center

This session will offer instruction on using internet search engines to target sites of interest. Participants will have the opportunity to search the Internet for information on grants, school technology plans, educational resources, and latest research. A list of recommended sites will be shared.

Prerequisite: None

Materials: One 3.5" disk

Instructors: Tim Fish — Steve Holmlund

Introduction to Networks

Time: 9:00 - 11:00

Session 297 Monday, February 12 Herndon High School

Each FCPS school will be "wired" within the next few years. This session will address what "wired" means, and the network of computers that will follow. The small-group format will allow participants to have their questions answered and view a demonstration of a current, working high school network.

Prerequisite: None

Materials: None

Instructors: Mike Rutherford — Barry Reddish
Tim Fish

Understanding the FCPS Networking Process

Time: 10:00 - 12:00

Session 298 Friday, February 23 Area III Office Assembly Room

This session will assist administrators to understand the necessary process for getting a network installed in their school. The FCPS Network Guidelines will be explained, and questions will be answered!

Prerequisite: None

Materials: None

Instructors: Mike Rutherford — Bob Maffett
Barry Reddish

Tips on Buying Computers for your School

Time: 1:00 - 2:30

Session 299 Tuesday, April 9 Area III Office Assembly Room

Buying computers for school or home can be a frustrating and confusing experience. This discussion-based inservice will give you the tools you need to confidently understand the complicated computer jargon to make informed decisions. Participants will leave with an awareness of the many variables to be considered when purchasing computers.

Prerequisite: None

Materials: None

Instructors: Elizabeth Rossini — Tim Fish

Managing a Technology Program in Your School

Time:1:00 - 3:00

Session 300 Thursday, May 16 Area III Office Assembly Room

This session is bursting with helpful tips for administrators trying to manage technology programs in their schools. Topics will include considerations for establishing a technology committee, management issues for creating and maintaining hardware/software inventories, and a discussion of the current copyright laws and how they impact software uses and copying. All participants will leave with an exhaustive list of technology related resources available both in and out of FCPS.

Prerequisite: None

Materials: None

Instructors: Tim Fish Elizabeth Rossini Bob Maffett

Using a Computer to Make an Administrator's Life Easier

Time: 9:30 - 11:30

Session 301 Wednesday, May 22 Marshall High School

Participants will learn various uses of computers to make their lives easier as professionals. Strategies will include: templates, using macros to make writing observation reports easier, mail merges for personalized communications, and databases to organize countless amounts of data (names, addresses, phone numbers, etc.). Other ideas include creating your own letterhead, substitute plans, and templates to use for memos to your staff, discipline records, etc.

Prerequisite: None

Materials: None

Instructors: Mike Rutherford Elizabeth Rossini

Creating a School's Technology Vision

Time: 9:30 - 11:30

Session 302 Wednesday, May 29 Area III Office Assembly Room

What do you want students to know and be able to do with technology when they leave your school? Where would you like your school to be in the year 2000? This session will address some possibilities and also give examples from many schools from around the globe.

Prerequisite: None

Materials: None

Instructors: Mike Rutherford Bob Maffett

Catalysts for Technology Integration

Time: 9:30 - 11:30

Session 303 Monday, March 11 Area III Office Assembly Room

How can you, a building principal, empower your teachers to use technology to improve their teaching skills? Current effective classroom strategies will be shared. A discussion-based format will include the opportunity for principals and teachers to share successful strategies.

Prerequisite: None

Materials: None

Instructors: Kathy Manley Mike Rutherford

Finding Funds for Technology

Time: 10:00 - 12:00

Session 304 Monday, March 25 Area III Office Assembly Room

Principals and PTA members are invited to attend this session which will address local, state, and national funding sources to increase technology in your school. Topics will include:

- Giant and Safeway receipts
- FCPS initiatives
- Government and private grants
- PTA strategies
- Business support
- School fund raisers

Prerequisite: None

Materials: None

Instructors: Steve Holmlund Kathy Manley

Appendix D

Teacher Survey

Office of Program Evaluation
Fairfax County Public Schools

Pyramid Technology Training Survey for Teachers

Directions: Please use the enclosed Scantron form and a pencil to record your responses. The Scantron form only should be returned via the pony **by May 1, 1996** to: Tom White. Office of Program Evaluation, Walnut Hill Center. A preaddressed return envelope is enclosed for your convenience. Your responses will be anonymous; only county-wide summary data will be reported. Thank you!

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1. What is your teaching assignment?
   A. regular classroom B. other (e.g., resource, itinerant, etc.)

2. What grade level do you teach?
   A. K-3 B. 4-6 C. 7-12

3. Where is your school located?
   A. Area I B. Area II C. Area III D. Area IV

4. How many computers do you have in your classroom? (count working computers only)
   A. none B. one C. two D. three E. four or more

5. If you have one or more working computers in your classroom, what is the platform of the newest machine?
   A. Windows B. DOS C. Macintosh D. Apple IIe, IIgs E. not applicable

6. If your school has a computer lab, about how many hours do your students spend in it during the average week?
   A. none B. one C. two D. three or more E. not applicable (no lab)

7. How would you rate your own efforts in acquiring the skills and knowledge you need to use technology as an instructional tool?
   A. very strong B. strong C. moderate D. weak E. very weak

8. At this time, how comfortable do you feel with using the software, computers, and related equipment at your school?
   A. very comfortable
   B. comfortable
   C. somewhat comfortable
   D. somewhat uncomfortable
   E. very uncomfortable

For Questions 9 through 18 below, indicate if you participated in a training session led by one or more of the Pyramid Technology Training Specialists. Use the following scale:

A. yes, this year only, 1995/96
B. yes, last year only, 1994/95
C. yes, both this year and last year
D. no

9. integrating technology into instruction
10. *ClarisWorks* (fundamentals, applications, advanced, integration) or *Microsoft Office*
11. *Macintosh* or *Windows* fundamentals
12. using multimedia technologies as an instructional tool (e.g., laserdisc player, A/V Macintosh, scanner, CD-ROM, Quicktake camera, VCR)
13. using telecommunications as an instructional tool (e.g., student use of the Internet, Scholastic Network, FCPS BBS, VaPen)
14. presentation software (*Kid Pix, PowerPoint, HyperCard, Hyperstudio)*
15. *AlphaSmarts, DreamWriters*
16. using technology to increase your personal productivity as a teacher (e.g., FCPS BBS, VaPen, Internet service provider, grading, managing student data, lesson or substitute plans)
17. local area network management and use (*QuickMail, Pegasus*, printer selection)
18. any other topic

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19. If you participated in one or more of the above training sessions this year (1995/96), how satisfied were you with the quality of the training?
A. very satisfied B. satisfied C. dissatisfied D. very dissatisfied E. not applicable

20. If you participated in one or more of the above training sessions this year (1995/96), were you able to apply what you learned?
A. yes B. no C. not applicable

21. Apart from group training sessions, have you received *individual* help from a Pyramid Technology Training Specialist this year (1995/96)?
A. yes, help with an instructional application of technology
B. yes, help regarding a technical problem with hardware or software
C. yes, help with technology enhancing my productivity as a teacher
D. yes, help with two or more of the above (A, B, C)
E. no, I have not received individual help this year

22. If you received individual help from a Pyramid Technology Training Specialist this year, how satisfied were you?
A. very satisfied B. satisfied C. dissatisfied D. very dissatisfied E. not applicable

23. If you did not receive individual help from a Pyramid Technology Training Specialist this year, did you ask for it?
A. yes B. no C. not applicable (did receive help this year)

Questions 24 through 27 refer to your use of technology at this time, April 1996. Use the following scale:

A. almost every day
B. at least once a week
C. at least once a month
D. less than once a month
E. never or almost never

At the present time, how often do you ...

24. use computers and software as an instructional tool?
25. use technology to enhance your personal productivity as a teacher (e.g., FCPS BBS, VaPen, Internet, grading, managing student data, lesson or substitute plans)?
26. use multimedia technologies as an instructional tool (e.g., laserdisc player, A/V Macintosh, scanner, CD-ROM, Quicktake camera, VCR)?
27. use telecommunications as an instructional tool (e.g., Internet, Scholastic Network)?

For Questions 28 through 35, indicate if your *students'* use of technology has changed, comparing this year and last year, and considering both quantity and quality of use. Use the following scale:

A. My students use it more frequently this year.
B. My students use it in a more effective way this year.
C. Both (A) and (B)
D. Neither (A) nor (B)
E. Not applicable (inappropriate for my grade or subject, or students lack access)

28. word processing
29. spreadsheets
30. data bases
31. graphics and design
32. telecommunications (e.g., Internet, Scholastic Network, VaPen, FCPS BBS)
33. multimedia technologies (e.g., laserdisc player, A/V Macintosh, scanner, CD-ROM, Quicktake camera, VCR)
34. presentation software (e.g., *Kid Pix, PowerPoint, HyperCard, Hyperstudio)*
35. curriculum-specific software (e.g., *Math Blaster, Oregon Trail, PhotoShop, Interactive Physics)*

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36. Since September 1994, the cumulative impact of the Pyramid Technology Training Specialist(s) on my teaching has been
A. very great B. great C. moderate D. limited E. minimal or none

37. Since September 1994, the cumulative impact of the Pyramid Technology Training Specialist(s) on my students' learning has been
A. very great B. great C. moderate D. limited E. minimal or none

Appendix E

Administrator Survey

Office of Program Evaluation
Fairfax County Public Schools

Pyramid Technology Training Survey for School Administrators

Directions: Use the enclosed Scantron form and a pencil to record your responses. Leave the name, subject, and date spaces blank. Your responses will be anonymous; only county-wide summary data will be reported. The Scantron form only should be returned via the pony **by June 28, 1996** to: Tom White, Office of Program Evaluation, Walnut Hill Center. Please use the enclosed preaddressed return envelope. Thank you!

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1. In which kind of school do you serve as an administrator?
   A. elementary
   B. middle
   C. high
   D. secondary
   E. alternative or center

2. Where is your school located?
   A. Area I
   B. Area II
   C. Area III
   D. Area IV

3. Since September 1995, how often have you had an opportunity to discuss technology issues with the Pyramid Technology Training specialist who is assigned to your building?
   A. never
   B. 1 to 5 times
   C. 6 to 10 times
   D. more than 10 times

4. Did you or any of your administrative staff receive individual help from a Pyramid Technology Training specialist this year (1995-96)?
   A. yes
   B. no

5. If you received individual help from a Pyramid Technology Training specialist this year (1995-96), how satisfied were you?
   A. very satisfied
   B. satisfied
   C. dissatisfied
   D. very dissatisfied
   E. not applicable

Please continue with Question 6 on the other side of this page.

6. Since September 1994, the cumulative impact of the Pyramid Technology Training specialist(s) on the quality of *instruction* in your school has been
   A. very great
   B. great
   C. moderate
   D. limited
   E. minimal or none

7. Since September 1994, the cumulative impact of the Pyramid Technology Training specialist(s) on the quality of *students' learning* in your school has been
   A. very great
   B. great
   C. moderate
   D. limited
   E. minimal or none

For Questions 8 through 13, please use the following scale:

A. Strongly agree
B. Agree
C. Disagree
D. Strongly disagree
E. Not applicable or insufficient information

All of these questions refer to the current school year, 1995-96.

8. The Pyramid Technology Training specialist(s) made a positive difference in your school's ability to gain access to the technology training it needs.

9. The Pyramid Technology Training specialist(s) provided high quality staff development to integrate technology in classroom learning activities.

10. The Pyramid Technology Training specialist(s) effectively solved problems with hardware and software by providing technical support or coordinating efforts to provide technical support.

11. The Pyramid Technology Training specialist(s) helped staff at your school by referring them to other FCPS technology resources (e.g., ESSO, DIT, DIS, Media Services).

12. The Pyramid Technology Training specialist(s) helped your school with technology planning and/or purchasing.

13. The Pyramid Technology Training specialist(s) helped your school with the county needs assessment process for planning and implementing a network.

Appendix F

School-Based Computer Leader Survey

Office of Program Evaluation
Fairfax County Public Schools

Pyramid Technology Training Survey

Directions: Use the enclosed Scantron form and a pencil to record your responses. Leave the name, subject, and date spaces blank. Your responses will be anonymous; only county-wide summary data will be reported. The Scantron form only should be returned via the pony **by June 21, 1996** to: Tom White, Office of Program Evaluation, Walnut Hill Center. Please use the enclosed preaddressed return envelope. Thank you!

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1. Which of the following best describes your role or position in the school?
   A. technology coordinator
   B. computer lead teacher
   C. administrator
   D. media specialist
   E. none of these

2. In what kind of school do you work?
   A. elementary B. middle C. high D. secondary E. alternative or center

3. In which Area is your school located?
   A. Area I B. Area II C. Area III D. Area IV

4. Did your principal provide class coverage this year for teachers to participate in technology staff development activities led or sponsored by a Pyramid Technology Training Specialist?
   A. yes B. no

5. Does your school have a technology committee that meets on a regular schedule?
   A. yes B. no

6. Has your Pyramid Technology Training Specialist been invited to technology planning meetings?
   A. yes B. no

7. How many computers are in the average classroom in your school?
   A. none B. one C. two D. three E. four or more

8. What is the average number of hours per week that the typical student in your school spends in the computer lab, if you have one?
   A. none B. one C. two D. three or more E. not applicable (no lab)

For questions 9 through 11, please use the following scale:

A. very satisfied
B. satisfied
C. dissatisfied
D. very dissatisfied
E. not applicable (no such services provided or insufficient information)

9. How satisfied are you with the technology *training* services provided by the Pyramid Technology Training Specialist assigned to your school?

10. How satisfied are you with the *technical support* services provided by the Pyramid Technology Training Specialist assigned to your school?

11. How satisfied are you with the *technical advice and referral* services provided by the Pyramid Technology Training Specialist assigned to your school?

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12. Since September 1994, the cumulative impact of the Pyramid Technology Training Specialist(s) on the quality of *instruction* in my school has been
A. very great B. great C. moderate D. limited E. minimal or none

13. Since September 1994, the cumulative impact of the Pyramid Technology Training Specialist(s) on the quality of *students' learning* in my school has been
A. very great B. great C. moderate D. limited E. minimal or none

14. At the present time, my school's need for staff development to integrate technology into the classroom is
A. very great B. great C. moderate D. limited E. minimal or none

15. At the present time, my school's need for technical support to solve problems with hardware and software is
A. very great B. great C. moderate D. limited E. minimal or none

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For Questions 16 through 25, please use the following scale:

A. strongly agree
B. agree
C. disagree
D. strongly disagree
E. not applicable or insufficient information

All of these questions refer to the current school year, 1995/96.

16. The Pyramid Technology Training Specialist has been effective in identifying, or helping staff to identify, technology training needs at my school.

17. The Pyramid Technology Training Specialist has made a positive difference in my school's ability to gain access to the technology training it needs.

18. The Pyramid Technology Training Specialist has provided high quality staff development to integrate technology in classroom learning activities.

19. The staff development provided by the Pyramid Technology Training Specialist was relevant to my school's technology goals.

20. The staff development provided by the Pyramid Technology Training Specialist was appropriate for the staff at my school.

21. The Pyramid Technology Training Specialist helped staff at my school to increase their personal productivity through use of software (e.g., computerized gradebook).

22. The Pyramid Technology Training Specialist has provided technical support that effectively solved problems with hardware and software.

23. The Pyramid Technology Training Specialist has helped staff at my school by referring them to other FCPS technology resources (i.e., ESSO, DIT, DIS, Media Services).

24. The Pyramid Technology Training Specialist has helped my school with technology planning and /or purchasing.

25. The Pyramid Technology Training Specialist has helped my school with the county needs assessment process for planning and implementing a network.

Thanks for your cooperation. Please return the answer sheet to Tom White, Office of Program Evaluation, by June 21.

U.S. Department of Education
Office of Educational Research and Improvement (OERI)
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