A CASE STUDY OF TEACHER PERSPECTIVES CONCERNING THE EFFECTIVE USE OF AN INTEGRATED LEARNING SYSTEM

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A CASE STUDY OF TEACHER PERSPECTIVES

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CHAPTER I

INTRODUCTION

Computer-based integrated learning systems (ILSs) of today are the products of more than three decades of development. In fact, one of the fastest-growing sources of technology found in schools today is that of an integrated learning system (ILS). In 1989, seven ILS companies grossed $181 million, and in 1990 education spent almost $200 million on ILSs (Bailey, 1992). School systems in the United States are spending approximately 50% of the billion-plus dollars on purchasing and maintenance of ILS systems (Niederhauser, 1996).

Initially, ILSs were considered as fringe educational products. The primary use of an ILS was to assist at-risk students. In the early nineties, however, schools began implementing ILSs to meet the needs of the general student population (Mageau, 1990).

Generally, ILSs offer a variety of unique features. ILSs are software/hardware systems that provide instructional material through a management system that monitors and reports on student performance (Sherry, 1992a). Most ILSs offer materials aimed at the K-8 curriculum, while a few offer materials for secondary, adult education, Pre-K and English as a Second Language (ESL) programs. Although the ILSs share some common features, their philosophy, design, and content vary widely (Wilson, 1990).

Some researchers and practitioners believe that the potential use of an ILS for changing how we learn and teach is encouraging (Bender, 1991; Mageau, 1990; Sherry, 1990a; Trotter, 1990). Blickhan (1992) believed that the amount of student learning that takes place with an ILS depends

> on how the teacher manages student information; the variety of instructional strategies employed; how well motivated the students are; the amount of time scheduled for individual students to work on the system; and the balance between using an ILS and other teaching tools. (p. 48)

Others oppose (1) the high cost of school funding to implement an ILS program, (2) the instructional image of a drill and practice approach to basic-skills learning, and (3) the increasing loss of curriculum control by teachers and administrators (Bailey, 1992; Maddux & Willis, 1992).

Research has been conducted regarding computer use and student achievement ever since it was first used as a tool for learning. Prior to the development of computer programs such as integrated learning systems, this early use of the computer as a tool for increasing student achievement was more commonly known as computer-assisted instruction. One well known meta-analysis of computer-assisted instruction (CAI) research conducted by Niemiec and Walberg (1985) revealed that computer-assisted instruction was "effective in raising student achievement scores, but that different classes of children and different forms of CAI produce different results" (p. 435).

As computer-assisted programs improved, networked computer systems evolved which included management systems that provided a means in which to monitor student progress. These computer programs became known as integrated learning systems (ILSs).

Henry Jay Becker (1992a) examined more than 30 studies related to the effectiveness of ILS use in regards to student achievement. Results indicated that a wide range of effectiveness existed, and achievement gains were modest. Becker (1992b) concluded that "effectiveness is only partly in the instructional software; it is largely in how well teachers can use this resource along with their own talents and other resources to accomplish learning and competence in their students" (p. 7).

Two researchers, Lani Van Dusen and Blaine Worthen, have investigated the use of ILSs for approximately five years. Based on the varied results of previous research regarding the effects of computers on student achievement, Van Dusen and Worthen (1992) believed that the manner in which the ILS was used by teachers could possibly account for the varied results of the previous research. They sought to investigate factors that would facilitate or impede implementation of an integrated learning system. Their conclusions were drawn from nine empirical studies of ILS implementation in 23 schools as well as their own informal observations of ILS implementation regarding ILS use in eight additional schools. Their investigation led them to believe that "unless ILSs are properly and adequately implemented, it is not reasonable to expect them to result in gains in achievement and affective outcomes envisioned by their developers and the adopting schools" (p. 16).

Although implementation strategies varied somewhat within schools for different ILSs, Van Dusen and Worthen (1992) identified four components they believed to be essential in the effective use of any ILS: (1) student time on the ILS, (2) teacher involvement with the ILS system, (3) integration of the ILS into classroom curriculum, and (4) staff training in ILS use. These components for effective ILS use have also been

supported by other researchers, practitioners, and commentators (Bailey & Lumley, 1991; Blickhan, 1992; Komoski, 1990; Mageau, 1992; Shore & Johnson, 1992).

Other researchers such as Sherry (1990) and Alifrangis (1990) believe that the full potential of the ILS has yet to be realized. This view was also supported by Becker (1992) who stated that "the evidence from existing evaluations of ILSs is that integrated learning systems have not achieved their potential in American education" (p. 6).

Whenever schools implement new programs, teachers have the responsibility of implementing the programs effectively. If teachers are to be effective in ILS implementation, program use must be examined in order that the maximum benefit of the program can be achieved. Bender (1991) stated that "In order for a system to work correctly, everyone must actively become involved in its management. School districts that adopt ILSs must also be able to develop a system of measurement to make logical decisions about the effectiveness of their equipment" (p. 22). Part of that evaluation must consider how the program is actually being used. Teachers should also consider if the program is being used to its maximum potential.

Administrators who implement an ILS must be informed regarding current ILS research and funnel that information to teachers who are presently involved with the management and use of an ILS. Bailey and Lumley (1991) believed that teachers who use an ILS should "initiate school-based research focusing on their ILSs. This individualized form of research is necessary to make intelligent decisions about current and future use of ILSs as teaching tools in schools" (p. 22).

Purpose of the Study

It would be prudent of any school system that is investing a large amount of funding for ILS implementation to investigate its own use of the system in view of previous research. This researcher was teaching in a K-1 elementary school that implemented an integrated learning system three years ago as a means of assisting K-1 students in their development of reading and math. Initial training was provided to acquaint teachers with the management and use of the ILS. Two additional training sessions followed initial training within the first two years of implementation.

The use of the ILS by teachers had not been examined in this school to determine if the ILS was being effectively used to its maximum potential. Therefore, the purpose of this study was to investigate the current use of an ILS by five female teachers and compare the results of this study to the previous findings of Van Dusen and Worthen (1992) regarding effective ILS implementation. Results from this study were used to determine if the ILS was being used to its maximum potential two years after its implementation. This study investigated the use of an ILS in regard to the following three components: (1) teacher involvement with the ILS, (2) integration of the ILS with classroom curriculum, and (3) staff training in ILS use.

Research Questions

The following questions guided this study:

1. How do teachers view their roles as facilitators of an ILS program?

2. What strategies do teachers employ to integrate the use of the ILS with classroom curriculum?
3. How do teachers view the training they received concerning the effective use of an ILS?

Significance of the Study

This researcher was interested in investigating the current use of an ILS within a K-l elementary school. In the early nineties, Van Dusen and Worthen (l992) investigated the use of ILSs and suggested four components they believed to be necessary for effective ILS use. This study was significant in order to determine if an ILS was being used more effectively today within a school setting than approximately ten years ago.

It should also be noted that Van Dusen and Worthen (l995) are professors at Utah State University. Lani Van Dusen is Senior Evaluation Associate and Blaine Worthen is Director at the Western Institute for Research and Evaluation. Their investigations of ILSs covered a period of five years. A theoretical framework for this study was developed using the findings of Van Dusen and Worthen (l992). This researcher used the conclusions of Van Dusen and Worthen (l992) for effective ILS implementation as a basis for comparison with the findings from this study. Findings and conclusions from other researchers, commentators, and practitioners were given as additional support for Van Dusen and Worthen's guidelines. This theoretical framework can be found in Chapter III.

According to Shore and Johnson (l992), the integration of ILS instruction with the classroom curriculum was an important element in successful and effective ILS use.

They believed the ILS was a promising instructional tool. However, Shore and Johnson stated that additional research was needed in order to determine how to use the program more effectively in connection with the classroom. They believed further research was needed to maximize its effectiveness in student learning.

Alifrangis (1990) believed that schools that implement an ILS should "undertake and report on their own studies of its effectiveness, thereby increasing the body of research in the use of integrated learning systems in a school environment" (p. 23). The results from this study can add to the knowledge base for effective use of the ILS and its integration with classroom curriculum. Results of this study can also be shared with other schools contemplating the purchase of an ILS in order that effective implementation and use of an ILS might be achieved.

Finally, this study was significant to the elementary schools where the ILS was implemented. Results of the study can be used to evaluate the strengths and weaknesses related to the current use of the ILS program.

Further needs of teachers regarding maximum ILS use can be identified and addressed. An investigation into the use of any program should lead to its improvement and effective use that will ultimately benefit students in their endeavor to become successful learners.

Assumptions

1. In this study it is assumed that the participants were representative of other teachers who were certified to teach at the primary grade level.

2. It is assumed that the teachers in the study received similar training in the use of an integrated learning system since training sessions within the school setting were required.
3. Since the teachers did not receive incentives and freely gave of their own time to participate in the study, it is assumed that the responses given in this study were truthful and acknowledged to the best of their abilities.

Limitations

1. Participants in the study were limited to five female, elementary teachers who had used the ILS during the two year period from 1997 - 1999. Male teachers were not available at this school site. Other teachers within the school setting who had used the ILS system for less time or who had not received initial training were excluded from the study.
2. One of Van Dusen and Worthen's (1992) components for effective ILS use addressed student time on the ILS. Since the time frame for student ILS use met the minimum requirement for effective use, student time was not investigated in this study. Additional aspects regarding student time could be addressed in future research. Therefore, this study was limited to the three components that involved teachers: (1) teacher involvement with the ILS, (2) integration of ILS with classroom curriculum, and (3) staff training in ILS use.

Definition of Terms

Analytic Generalizations – According to Yin (1994), this is a method of analyzing data within case studies. This method uses a previously developed theory as a template in which to compare the results of a current study. If two or more cases within a case study are shown to support the previously developed theory, theoretical replication may be claimed, and theory has been validated.

Facilitator – In this study, facilitator refers to a teacher who acts as a guide to student learning through the use of an ILS and not just as a dispenser of information. Facilitators serve as resource persons and actively monitor students working on an ILS (Bailey & Lumley, 1991).

Integrated Learning Systems – "ILSs are complex, integrated hardware/software management systems using computer-based instruction. Common subjects on ILSs include mathematics, reading, and writing (language arts). Newer systems include adult learning, English as a second language, GED, and science" (Bailey, 1992, p. 3).

Integration – For the purpose of this study, integration refers to "the consolidation and synthesis of information from the ILS and the classroom" (Van Dusen & Worthen, 1992, p. 19). Van Dusen and Worthen (1995) also defined integration as "one curriculum that is presented through a combination of ILS activities, small-group instruction, one-on-one tutorials, and other activities" (p. 23).

Maximum Potential – In this study, maximum potential referred to three of the components developed in Van Dusen and Worthen's (1992) findings for effective use of

an ILS. These components were (1) teacher involvement with the ILS, (2) integration of the ILS with the classroom curriculum, and (3) staff training in ILS use.

Patterning-Matching Logic – This is one of several techniques that can be used in the analytic generalization of case studies to analyze data. Pattern-matching logic consists of breaking down data into patterns or categories that allow for an analysis and comparison of data. Pattern-matching logic can be used to compare the patterns found within a current study to those patterns found within a previously developed theory (Yin, 1994).

Substantive Theories – According to Glesne (1999), theory can be formulated through empirical generalizations or substantive theories. This type of theory

> consists of outcomes (empirical generalizations) from related studies and mainly functions to raise questions or provide rationale for new studies, and to compare and contrast with study findings. A review of literature related to the study's main concepts provides the base for working with empirical generalizations. (p. 22)

Organization of the Study

Chapter I presents the introduction for this study. The chapter also presents the purpose of the study and research questions as well as the significance of the study. Assumptions, limitations, and definitions of terms regarding the study are also included.

Chapter II presents the review of the literature and research regarding the use of an integrated learning system. The review includes three areas: (1) ILSs: Its Advantages and Disadvantages, (2) ILS and Its Effectiveness, and (3) Van Dusen and Worthen's (1992) Guidelines For Effective ILS Use.

Chapter III describes the design and methods used to collect and analyze the data from the study. It presents an interpretative case study method by Merriam (1998)

through the use of semi-structured interviews, observations, and a self-evaluation survey of basic computer use by teachers. The case study included five female teachers who were using an ILS. A presentation of the participants in this study is also included in Chapter III.

Chapter IV is the presentation and analysis of data collected through interviews, observations, and a self-evaluation survey of computer use by teachers. The interviews and observations addressed three areas of concern: (1) teacher involvement with the ILS, (2) integration of ILS with the classroom curriculum, and (3) staff training in ILS use. Participant responses were presented in written form regarding these three areas. This chapter contains analyzed patterns that emerged from the interview and observation data. These patterns were compared to patterns found in Van Dusen and Worthen's (1992) findings in order to establish areas of agreement and disagreement.

Chapter V is a summary of the findings and conclusions from this study regarding the current use of an ILS by teachers in a K-1 elementary school setting. Recommendations for future research are also presented.

CHAPTER II

REVIEW OF THE LITERATURE

This chapter presents a review of the literature important to the study of using integrated learning systems (ILSs) to its maximum potential. The review includes three topics: (1) ILSs: Its Advantages and Disadvantages, (2) ILSs and Its Effectiveness, and (3) Van Dusen and Worthen's (1992) Guidelines For Effective ILS Use.

ILS: Its Advantages and Disadvantages

One of the fastest-growing sources of technology found in schools today is that of an integrated learning system (ILS). "In the U.S. one estimate indicated that in terms of software expenditures alone, one-half of the current dollar investments are going to ILS companies" (Bailey, 1992). ILSs are now installed in about 25 % - 30% of the school systems in the United States (White, 1992). Considering the amount of money that is being invested in ILSs, schools and developers need more theory that is supported with accurate research in order to provide them with the most effective guidelines in the design and operations of ILSs (Hativa & Becker, 1994).

Integrated learning systems are the products of more than three decades of development (Hativa & Becker, 1994). ILSs evolved from former paper-based programmed instruction lessons and modules that were based on Skinner's operant-

conditioning theory of learning. These former programmed lessons were developed into various microcomputer-based drill-and-practice, tutorial, and educational game programs that have been used in schools and homes for over twenty-five years. What these former paper-programs and microcomputer-based, drill-and-practice programs had in common were the presentation of a question to an individual learner usually in multiple-choice format, a recording of the learner's response, feedback to the individual, and an automatic selection of the next question based partially on the individual's response.

As technology improved, computers were able to handle simultaneous multiple users through directly-connected terminals which enabled advocates of this particular mode of learning to develop concrete and comprehensive systems of instruction that could be marketed to various institutes of learning. Two commercially viable multiuser, individualized-oriented, computer-based lessons and practice systems appeared in the 1960s and early 1970s (Hativa & Becker, 1994).

During this same time period, Dr. Patrick Suppes developed sequenced drill and practice computer-aided instructional materials for mathematics (Hativa & Becker, 1994). These materials were organized into sequences of learning blocks known as strands. These newly developed programs combined the use of a management system to assess and monitor student programs (Sherry, 1992a). These systems ran on a mainframe computer connected to dumb computer terminals. These terminals became workstations for students.

Other ILS companies evolved and used Suppes model of a comprehensive, individualized, diagnostic and prescriptive computer-assisted instruction system (Hativa & Becker, 1994). Around the mid 1970s, learning games, branching techniques, and

graphics were added to the ILSs as a means of improvement. By the mid 1980's, voice recording and playback, color graphics, and CD-ROM technology became part of the ILS programs (Sherry, 1992a).

According to Sherry (1992a), the ILSs may continue to improve and develop into systems that provide links to current textbooks that are being used in the classroom. ILSs might eventually incorporate the use of videodisc "texts" within their programs. Sherry also believes it is possible that improvements in the ILS may lead to diagnostic/prescriptive systems that will provide correlations to external (non-ILS) media. ILSs may even develop the capability of providing students with printouts that list appropriate non-ILS lessons and materials such as print, videos, and other sources of instructional material that can be used for additional learning.

Integrated learning systems (ILSs) are "complex, integrated hardware/software management systems using computer-based instruction" (Bailey, 1992, p. 3). General characteristics of such systems include: (1) individualized and self-pacing lessons that are correlated to specific instructional objectives which are tied to standard curriculum, (2) uses courseware that covers several grade levels in comprehensive style, (3) provides courseware with graphics and sound presented on a network system, and (4) includes a management system that collects and records the results of student performance (Bailey, 1992). Common subjects presented on the ILS include mathematics, reading, and writing. Newer systems include adult learning, science, and English as a second language.

The companies that provide ILSs are as varied as the systems themselves (Wilson, 1990). Companies that provide ILSs are: Computer Curriculum Corporation (C.C.C.),

Computer Systems Research (CSR), Computer Networking Specialists (CNS), Idea Learning Systems, Innovative Technologies in Education (ITE), Jostens Learning Corporation, Wasatch Education Systems, WICAT Education, and Roach Organization. Computer-based ILSs can be found throughout many countries such as Austria, United States, the United Kingdom, Canada, Israel, Kenya, Namibia, Germany, Hungary, and Spain (Hativa & Becker, 1994).

Although the ILSs share similar characteristics, they vary greatly in philosophy, design, and content (Wilson, 1990). From a philosophical viewpoint, some systems are designed as remedial programs, others are used as a comprehensive instruction, and some systems offer higher-order thinking skills. The approaches used within a system are either skills based or concept based.

> Skills-based programs are designed primarily to provide diagnostic/prescriptive intervention for remediation of precise skills (such as proper decoding of digraphs as a reading skill). Concept-based programs pay more attention to problem solving and higher-order thinking skills. (p. 23)

Some ILS companies are attempting to incorporate simulations and exploratory activities into their programs as a way to integrate the development of basic skills within problem solving and higher-order thinking skills (Sherry, 1992b).

Literature regarding advantages and disadvantages of an ILS are mixed. Some researchers and practitioners believe that the potential use of an ILS to change learning and teaching is encouraging (Mageau, 1990; Sherry, 1990; Trotter, 1990). Others oppose (1) the instructional image of a drill approach to basic-skills learning, (2) the increasing loss of curriculum control by teachers and administrators, and (3) the high cost of school funding to implement the program (Bailey, 1992; Maddux & Willis, 1992).

According to the Educational Products Information Exchange (EPIE) Institute (as cited in Trotter, 1990) cost of an ILS can range anywhere from $25,000 to $250,000 for equipment, software, and installation of 30 computers. Additional costs can be found in annual licensing fees, maintenance, and software upgrades.

Shore and Johnson (1992) along with White (1992) believed an advantage associated with integrated learning systems to be found in the program's capability of providing individualized pacing and review for students as well as systematic exposure to the curriculum. Student errors are recorded and lessons are programmed to provide additional practice in low areas. ILSs present curriculum in a manner conducive to learning. Programs provide motivation through an interactivity between the student and the computer in a game-like format. Finally, ILSs can provide a comprehensive record for all students on the system.

Most ILSs provide immediate feedback to student responses. Feedback within a learning environment can be beneficial and sometimes motivating. For example, as children begin to read, feedback is quite helpful.

> For slower learners and those with lower-self image, positive feedback can play a large reward function . . . . For average and above-average learners, feedback plays mostly an information role. Therefore, it is most useful when a skill is first developing and decreases in value as the learner becomes more competent at a task. (Venezky & Osin, 1991, p. 92)

Blickhan (1992) believes that teachers can use the ILS to address student needs. ILS programs allow students to work at their own pace on individual lessons in a sequential order. ILSs provide the teacher with the flexibility to assign reteaching lessons or advance students to a more challenging level. Some ILSs allow the teacher to alter the

sequence of the lessons to accommodate individual, small group, or whole class instruction.

One of the most impressive features of the ILS is its management system which provides for individual learning for all students (Mageau, 1990). According to Bailey and Lumley (1991), the ILS can "randomly generate problems, adjust the difficulty and sequence of problems based upon student performance, and provide appropriate and immediate feedback (in private)" (p. 21). This type of management system allows teachers to identify areas of student difficulty in order to plan for individualized remediation activities. The management system can provide detailed student progress reports as well as reports for entire student populations across all grade levels throughout the different subjects (Shore & Johnson, 1992). Proponents of ILSs strongly praise the highly diagnostic and prescriptive assessment of students provided by an ILS management system. These reports can be used to develop lessons that meet the individual needs of the learner (Shore & Johnson, 1992).

Bailey and Lumley (1991) state that one potential advantage of ILSs is that it can allow teachers to take on the role of facilitator as opposed to a dispenser of information. As students are working on their individualized program, the teacher can act as a facilitator by working with individual students or small groups of students in order to give additional assistance or explanation. As teachers view areas of student difficulty, they can adjust the program for the student to meet individual needs. For the most part, they believe this has not happened yet. ILSs are primarily used in the capacity of "add-on" to the regular curriculum. "ILSs can become one of the teacher's major instructional

strategies and supervisors must assist teachers in understanding how ILSs can assume this new role in instruction" (p. 23).

Researchers and practitioners who oppose the use of an ILS present the following disadvantages as major criticisms: (1) difficulty in ILS use, (2) limited access of computers to teachers, (3) use of behaviorist theory as a mode of instruction, and (4) high cost of implementation (Shore & Johnson, 1992). These disadvantages should be addressed by any school considering the implementation of an ILS.

One disadvantage of the ILS appears to be in the difficulty of use. Often these systems require extensive familiarity of the user with the operating systems. In 1994, approximately 15 % of the teachers reported training in educational technology of at least nine hours (Coley, Cradler, & Penelope, 1997). "One of the most important findings of the EPIE study was that ILS staff training has been grossly neglected" (Bailey & Lumley, 1991, p. 23). Adequate training appears to be needed if teacher familiarity of the ILS is to occur.

Another disadvantage of the ILS is the limited access and lack of flexibility for teacher use. In order to reduce implementation costs, schools set up the ILS in computer labs with set schedules. Teachers have difficulty gaining access to or using information stored in the computer. Additional time for students to use the computer is also minimized (Shore & Johnson, 1992).

Educators who are in opposition to the use of ILSs hold the beliefs that machines are not as effective as teachers and are too impersonal. They criticize the program as teaching only routine, low-level skills without the needed higher-order conceptual skills. They believe students will find the instruction boring and repetitive (Shore & Johnson,

1992). Others in opposition to the implementation of an ILS believe that computers stifle creativity, lack social interaction with peers and teachers, and oppose the linear, lockstep control of the learning process that runs contrary to a constructivist's way of learning (Heinich, Molenda, Russell, & Smaldino, 1996).

ILS and Its Effectiveness

This study investigated the currrent use of an ILS and compared the results of this study to the research findings of Van Dusen and Worthen (1992) regarding effective implementation of an ILS. The following information is presented as background information in order to develop an understanding in the need for effective implementation of an ILS. This literature presented some of the findings regarding previous ILS research.

Trotter (1990) reviewed the research regarding the effectiveness of ILSs on student achievement. He concluded that

> hundreds of studies exist that attribute gains in standardized test scores and other improvements to the use of integrated instructional systems. But many of those studies–handed out freely by vendors and proud school systems–don't stand up to methodological analysis. (p. 13)

One problem with the research literature on the ILS is that many of the meta-analytic reviews that occurred in the 1980s regarding effectiveness of computer-assisted instruction were based on systems that had been implemented as much as fifteen years prior. "However, most of those studies have focused on diskette-based group-paced implementation rather than the individualized, network-based implementations with strong computer-based management of student task assignments that characterizes ILSs" (Hativa & Becker, 1994, p. 10). This implies that one should make sure when

investigating the research regarding ILS effectiveness that comparisons are made to research related to ILSs and not research based on diskette-based group-paced implementation. One study conducted by Niemic and Walberg (as cited in Hativa & Becker, 1994) has suggested positive effects of ILSs when compared with conventional instruction using no computers.

Becker (1992a) examined more than 30 studies related to the effectiveness of ILS use in regards to student achievement. Results from the 30 studies indicated that a wide range of effectiveness existed, and achievement gains were modest. Becker's examination of the studies revealed that most of the research designs had flaws that contributed to inadequate norming procedures. The designs lacked real control groups except for those comparisons with national norms. However, the widely varying effect sizes and the modestly positive effect sizes that were typical within the studies suggest that

> (1) results will differ as much based on the different conditions of the study as on the different software packages in use (and on the different methodologies used to design and conduct the analysis); (2) that students generally do at least somewhat better using ILSs than they would be expected to do; (3) that sometimes the results are substantially superior to what one would expect (but it would be difficult at this time to predict the conditions under which those substantial advantages occur); and (4) that evaluation data–particularly evaluation data as produced and disseminated on studies accomplished to date–are too weak a reed on which school districts should base their acquisition and investment decisions. (p. 19)

Further research background information is presented by Hativa and Becker (1994) regarding other studies that have been conducted in Israel and the United States regarding the critical role that implementation methods have on student achievement outcomes. Some of the research presented in the article is as follows:

Van Dusen and Worthen (as cited in Hativa & Becker, 1994) conducted a quasi-experimental intact comparison design to investigate the influence of ILS implementation strategies in the areas of math and reading as well as teacher and student attitudes. They examined the effects of student time spent on the ILS and the amount of lessons completed. Results revealed that "increased time, lessons, and teacher integration produce significant effects in terms of student achievement and student teacher attitude" (p. 22).

Hativa (as cited in Hativa & Becker, 1994) also investigated the effects of increased time on student ILS performance. Increased student gains were noted. The results also revealed a direct relationship between progress gains and time on the ILS system for low SES students.

Mevarech (as cited in Hativa & Becker, 1994) addressed the concern of educators that the use of an ILS de-emphasized interpersonal relationships. Mevarech investigated the use of an ILS by students through two different settings: (1) student use of an ILS in individual settings, and (2) student use of the same ILS in a cooperative setting. Results revealed that students in the cooperative setting outperformed students in the individualized setting. Most ILSs appear to be used in individualized settings. This study suggests that the additional use of ILSs in cooperative settings should be considered regarding student learning.

Becker (as cited in Hativa and Becker, 1994) conducted a study of two inner-city elementary schools that implemented different ILSs using two different subjects: reading and math. This study examined the effect of ILS learning on student outcomes in relation to student achievement level. Results revealed that "most of the measures of

effectiveness were on the positive side of zero, but generally the size was small and inconsistent" (p. 76). However, the study identified two groups that appeared to benefit from ILS use. Students identified initially as high achievers and low achievers benefitted the most. Students identified in the middle benefitted the least. Becker concluded this was probably because teachers traditionally teach to the middle group in their classroom indicating that their needs are probably being met more in the classroom than either of the other two groups.

Becker (as cited in Hativa & Becker, 1994) also addressed the role of teachers regarding the use of an ILS. In this same study, he noted that (1) only a few teachers knew how to effectively adjust student assignments on the ILS, (2) none of the teachers knew about the management system, and (3) only minimal effort was made by the school to provide teachers with the skills and knowledge of ILS use. Becker concluded that the ILS had a positive yet small effect on student learning. He concluded that if ILS use produced small yet positive effects on student achievement, teacher involvement with the ILS could possibly enhance the level of student achievement.

The research provided in Hativa and Becker (1994) suggests that the use of an ILS is complex. Further research is still needed regarding the best way that implementation can be achieved.

According to Becker (1992a), a strong argument can be made for why schools might expect an integrated learning system to be effective in helping students to improve in their academic performance. The following components could support such an argument: (1) research exists to show that computer-based activities are motivational, (2) networked computer-based activities are more efficient of teacher and student time,

(3) networked computer-based systems that use centralized management systems enable teachers to target specific programs that will meet specific needs of the students, (4) management systems with strong diagnostic-prescriptive analysis systems can identify specific student needs and bring them to the attention of the teacher, (5) diagnostic-prescriptive analysis systems with incorporated tutorial services can provide direct instruction to the student's low areas, (6) networked systems supplied by a single vendor can provide multi-subject curriculum that span across several grade levels in a consistent manner that allows students to focus on the task at hand instead of focusing on how each separate software works.

In March 1990, the Educational Products Information Exchange (EPIE) Institute (as cited in Sherry, 1990) published the results of a 14-month study of integrated learning systems. The study evaluated the management system and courseware for eight ILSs through interviews and observations of students, teachers, and administrators who had used the ILS for at least one year. The study resulted in two major findings: (1) the majority of students, teachers, and administrators viewed all of the ILSs in a positive manner, and (2) the study revealed that schools could be making more effective use of the ILS programs. Even though the EPIE Report did not address student achievement on the ILS, the positive attitudes of the participants toward the ILS suggests a belief that the ILS may be effective in student learning. According to Sherry (1990), teachers who perceive the ILS "as nothing more than a nuisance may communicate negative attitudes to their students (which may lessen motivation)" (p. 190).

Van Dusen and Worthen's (1992) Guidelines For Effective ILS Use

Two other prominent researchers, Van Dusen and Worthen (1992) have studied the use of ILSs within schools. Their conclusions were developed from a critique of nine empirical studies of ILSs conducted in 23 schools within ten states. They also included their own informal observations of ILS implementation in eight additional schools. The combined data reflect the use of four different ILSs. Their conclusions were based on (1) surveys of approximately 300 teachers, administrators, and lab managers who used an ILS, (2) interviews that included individual and focus groups with over 100 principals, teachers, as well as vendor representatives, and (3) over 100 structured observations of ILS lab sessions and classrooms regarding ILS use and integration. Van Dusen and Worthen (1992) concluded from their analysis of the data that "unless ILSs are properly and adequately implemented, it is not reasonable to expect them to result in gains in achievement and affective outcomes envisioned by their developers and the adopting schools" (p.16).

Based on their analysis of the data, Van Dusen and Worthen's (1992) proposed four components they believed to be necessary if ILSs were to be used effectively. These components were (1) student time on the ILS, (2) teacher involvement with the ILS system, (3) integration with classroom curriculum, and (4) staff training in ILS use.

Student Time

Student time refers to a student's actual engaged time with the ILS. ILSs are designed for students to receive approximately 25% of instruction of a particular subject through ILS sessions. According to Van Dusen and Worthen (1992), the results revealed that most of the schools using ILSs "scheduled each student on the system for less than 60 minutes per week" (p. 17). Actual engaged student time during lab sessions were reduced due to such things as students waiting for help, waiting to log-on, or correcting computer glitches. Some lab observations revealed that "during a 30-minute session, students were actively engaged for only about 16 minutes" (p. 17). Van Dusen and Worthen (1992) suggested additional factors that could affect student time: (1) not enough computers, (2) scheduling difficulties in the ILS lab, and (3) school policies of equal access for all students. According to Blickhan (1992), in schools where the ILSs are in a single computer lab setting, time becomes an equity issue when in actuality it should be looked upon as a curriculum issue.

Another factor to consider in regards to the issue of time is the length of time that an elementary student versus an intermediate student can stay on task without teacher assistance. Shore and Johnson (1992) recommended that ILS sessions of approximately 20 minutes should be used with younger children. Lessons for intermediate students could average anywhere from 30 to 45 minutes in length. "Adequate and consistent time working on the integrated learning system is necessary to impact student achievement and other positive learner outcomes" (Shore & Johnson, 1992).

Teacher Involvement with the ILS

Wilburg (1995) states one of the most important aspects of successful ILS implementation is teacher involvement. "Most ILS systems were never intended to be stand-alone systems in which students work in isolation while their teachers remain unaware of what they are doing" (p. 8). It is believed that a small number of teachers monitor student progress, and their utilization of reports is limited.

Van Dusen and Worthen's (1992) guidelines state that "effective implementation requires that teachers be involved with their students while they work on the ILS" (p. 18). Results from their study revealed three behaviors of teachers that were crucial for ILS implementation:

> (1) teachers serving as a resource to students while working on the ILS (responding to student problems in the lab or monitoring use in the distributed setting); (2) teachers actively monitoring student progress while students are working on the computers; and (3) teachers using reports generated by the system. (p. 18)

Van Dusen and Worthen (1992) found that few teachers actively monitored student responses during lab sessions and reacted only when students signaled for help.

According to Shore and Johnson (1992), teacher involvement with the ILS curriculum varies widely. "Often scheduled computer lab time has been viewed by the classroom teacher as either prep time or free time and rarely as part of regular classroom instruction" (p. 38). This ILS pull-out approach has made it difficult for teachers to integrate the ILS curriculum with the classroom curriculum.

Mageau (1992) believes that teachers should accompany their students to the lab and circulate among them as they work. Some ILSs do not stop a lesson if a student is

having difficulty. Therefore, teachers who accompany their students to the ILS lab can serve as a resource person for the students.

Effective use of an ILS includes teacher involvement with the system-generated ILS reports that reflect student performance. These reports offer information such as the correct percentage of responses for each exercise attempted, specific learning objectives covered, and the amount of time required for a student to master the objective (Van Dusen & Worthen, 1995). This kind of information is essential if teachers are to plan appropriate learning activities for students.

According to Blickhan (1992), "Evaluation of task performance is essential when using an integrated learning system. Teachers must monitor and adjust programs on a regular basis in order for the instruction to be effective" (p. 47). ILS reports that reflect student achievement should be carefully analyzed so that additional school resources can be utilized to enhance or supplement ILS lessons.

Teachers can also work through a lesson in the lab with a student or small groups of students to aid in clarity of a given concept. Mageau (1992) suggests that "if more than one student is having difficulty in a particular skill area, have the teacher take them aside and work with them off-line before their next scheduled time at the computer" (p. 17). Conferences with students concerning their progress on the ILS is encouraged by ILS distributors. Communication between the school, students, and parents can be enhanced through the use of the various progress reports generated through the ILS management system.

Van Dusen and Worthen (1992) found through their investigations that teacher use of ILS student reports were being underused. Results indicated that "less than half of the

teachers use these reports on a regular basis. This low level of report usage means a potentially important aid in keeping track of student performance, and individual needs is being wasted" (p. 18).

According to Blickhan (1992), the amount of student learning that occurs with an ILS depends on

> how the teacher manages student information; the variety of instructional strategies employed; how well motivated the students are; the amount of time scheduled for individual students to work on the system; and the balance between using an ILS and other tools. (p. 48)

Balancing instructional strategies both in the classroom as well as in the ILS lab setting is of significant importance if the ILS is to be used effectively.

ILS Integration with Classroom Curriculum

Komoski (1990) believes that one thing that should be made clear about ILSs is that even though they are commonly termed integrated learning systems, such systems have not been designed to incorporate all of the students' in-school learning. Therefore, schools that are using an ILS will need to address the way that ILSs can be incorporated into the school's larger curriculum, into the teaching practices of the classroom teacher, and into the day to day learning experiences of the students. Throughout the past four decades, numerous studies have shown that most teachers desire to use the latest technology as well as to help prepare their students for technology use (Chin & Hortin, 1993).

According to Bailey and Lumley (1991), "In some school settings, the ILS is seen as a computer laboratory separate and distinct from the regular curriculum, and this is not

resulting in optimal educational benefits" (p. 22). Administrators and teachers must consider the various ways that an ILS can be used as a major instructional delivery system as opposed to a mere additional activity center. "ILSs must be integrated into the way that schools and teachers go about and think about learning and teaching" (p. 22).

ILSs are still being used primarily as an add on to the regular curriculum as opposed to being part of an integrated curriculum (Morton, 1996; Salomon, 1990). Salomon (1990) believes that when ILSs are isolated in a computer lab setting, a segregated image is formed that does not foster positive attitudes in teachers or students. Salomon (1991) cites four assumptions that can hinder the integration of the ILS into the regular curriculum: (1) the computer is not seen as a tool, but instead it is seen as a separate entity needing a special place and curriculum; (2) the use of the computer is to be learned as a separate topic onto itself, (3) the computer can be added to unchanging instructional practices, and (4) effective use of the computer depends solely on the software used. Salomon (1990) states that the ILS can become a major instructional tool for teachers. Teachers need to become aware of how ILSs can assist them in becoming facilitators of learning. According to Bailey and Lumley (1991), as teachers begin to use the ILS as a major teaching strategy, supervisors will need to provide more training in order to help teachers understand the full potential of the ILS.

Van Dusen and Worthen (1992) addressed the effective use of the ILS with integration of classroom curriculum. Van Dusen and Worthen (1992) referred to integration as "the consolidation and synthesis of information from the ILS and the classroom" (p. 19). The ILS is intended to be an extension of the basic curriculum and not a supplement to classroom learning. "There should be one curriculum that is

presented through a combination of ILS activities, small-group instruction, one-on-one tutorials, and other activities" (Van Dusen & Worthen, 1995, p. 33).

One way that the ILS can be integrated with the classroom is to correlate the objectives used in an ILS to the school's texts. This strategy is used in some form by all major ILS companies. Some ILSs have the flexibility to provide changes in the lesson sequence so that teachers can incorporate the objectives of the ILS with classroom learning. Mageau (1992) states that "being able to go in and easily choose and resequence lessons is an essential part of helping teachers fully integrate an ILS" (p. 22). Van Dusen and Worthen (1992) found a higher level of ILS integration within schools that used ILSs with this type of flexibility. However, having access to correlations of text and ILS objectives as well as the flexibility to adjust lesson sequences does not ensure that all teachers integrate the ILS with the classroom. In fact, Van Dusen and Worthen's (1992) studies revealed that "less than 25% of the teachers made use of these "tailoring" features on a frequent basis, and another 25% never did" (p. 19). Interviews with teachers indicate that only a few teachers were aware of or understood the ILS flexibility and how they should be involved with it.

Van Dusen and Worthen (1992) noted another area that appears to influence integration of the ILS with the classroom is the belief by most teachers that an ILS should be mainly used as a supplement. Their investigations have found that only a few schools use student performance on the ILS in grading student work and reporting student progress to parents. "When students and teachers are not held accountable for what students are learning on the ILS, it tends to de-emphasize the value of the ILS experience" (p. 19). Their studies suggested a greater level of integration in those schools

who incorporate student progress in terms of grades or other forms of feedback to both the students and parents.

According to Blickhan (1992), it is important for teachers to bridge what is occurring in the classroom with the student's ILS experience on a regular basis. For example, teachers can use hands-on materials in the classroom to teach a math concept and then continue developing the concept through ILS format. Research suggests that children gain the most from computer experiences if they are reinforced with specific concrete activities (Haugland, 1992).

Mageau (1992) suggests that integration of the ILS can be improved if time is set aside by each grade level to meet and discuss the use of the ILS system. Teachers can share ideas in how they are using the system in their daily teaching within the classroom.

Staff Training

Mergendoller (1997) states that "instead of new technologies changing schools, the schools have adapted new technologies to their own way of operating" (p. 14). He believes that if computer technology is to have any kind of effect on education, "significant changes will have to be made in the way teachers are trained" (p. 14). Mergendoller (1997) also believes that if teachers are to take full advantage of the instructional opportunities that computer technology offers, professional development is absolutely essential. He states this is true "whether one is talking about drill and practice courseware or complex collaborations" (p. 14).

In 1989 a statewide survey of California Public Schools (as cited in Chin & Hortin, 1993) revealed the following obstacles to increasing technology use: (1) lack of funding,

(2) lack of inservice training with reliable trainers, (3) lack of time for appropriate training, (4) limited or inadequate facilities, and (5) teacher discomfort with technology use. Chin and Hortin (1993) were of the opinion that obstacles to technology use could be addressed through (1) administrative support, (2) release time for teachers to periodically attend quality inservice training, and (3) a reward system for staff development. Hertzke (1992) states that the principal plays a key role in the implementation of technology within schools. "The success or failure of an ILS can generally be traced to the attitude displayed by the principal toward this new technology" (Hertzke, 1992, p. 45).

One of the most important findings of the EPIE study (as cited in Bailey and Lumley, 1991) was that training in ILS use has been grossly neglected. The results of the study revealed that 35 % of the teachers indicated they had received only two hours or less of training in use of an ILS, 25 % had received less than six hours of training, 25 % received one to two days, and only 6 % received five or more days of training (Trotter, 1990). Sherry (1990) was of the opinion that initial training sessions of one to two full weeks with at least three to four days of follow-up annual training for teachers should occur if full potential of ILS use is to be achieved. Sherry (1990) also suggested that

> In order to maximize the effectiveness of an ILS, teachers must be given the time and training necessary to understand how to take advantage of its strengths. In addition, they need training in how to coordinate the use of the ILS with their regular classroom instruction. Well-trained teachers can use the ILS to improve their students' attitudes, and they can coordinate ILS lessons with classroom assignments, read reports to monitor student progress, create incentives, and use reports generated by the ILS to diagnose and remediate individual students' skill deficiencies. (p. 119)

In schools studied by Van Dusen and Worthen (1992), teachers and principals were almost unanimous in their belief that high-quality staff development was essential

for effective implementation of an ILS. However, training sessions offered by the companies that produce ILSs vary greatly in the quality, availability, and cost. Some ILS companies provide quality staff development services to adopting schools, while other companies provide only minimal training. The cost of quality staff training should be considered by schools implementing an ILS.

Van Dusen and Worthen's (1992) guidelines for effective ILS implementation addressed the need for staff training. Successful implementation of any program requires sufficient training in order to obtain the desired results. Their studies revealed that teachers and administrators believe that staff training should include (1) basic instruction about the system, (2) strategies for integrating the ILS into the curriculum, and (3) use of student reports. Based on their findings, Van Dusen and Worthen (1992) made two assumptions regarding the need for staff training:

> (1) the teachers who will be most effective in implementing the ILS are those with the greatest familiarity and comfort level with the computer; and (2) increasing computer literacy and decreasing computer anxiety for teachers with those specific needs should raise the overall quality of implementation in that school. (p. 20)

Van Dusen and Worthen (1992) reviewed data from the studies concerning the views of teachers and principals regarding staff training. Data revealed that (1) teachers should propose specific needs for training, (2) specific training should be tailored to meet those needs, and (3) training should include more hands-on experiences.

Research has suggested that three to five years may be needed for an ILS program to become fully implemented (Cook, 1994). A study conducted by the University of Illinois (as cited in Cook, 1994) involving 122 teachers who use an ILS revealed that training conducted in a poor school climate will have reduced success. The results

revealed that school climate should include (1) clearly communicated goals, (2) teacher participation in ILS adoption, (3) shared interaction among teachers concerning ILS use, (4) teacher risk-taking, and (5) the presence of at least one ILS user enthusiast to encourage the rest of the staff. A staff development plan "must not only include formal training by outside consultants, but also opportunities for teachers to work together, coaching each other on relevant problems, and creating a supportive collegial work environment" (Cook, 1994, p. 67).

O'Donnell (1996) states there are three key areas that are extremely important to successful in-service. These three areas are (1) "administrative commitment and support for teachers, (2) teacher involvement in planning, design and development, and (3) teacher incentives" (p. 113). The school administration must exhibit a strong level of commitment and support of teachers that is on-going and consistent. Evidence to this level of commitment must be demonstrated by adequate funding. Schools may want to consider staffing a full-time technology coordinator to provide on-going support and assistance (Eiser & Salpeter, 1992). Research identifying teachers who were experts at using computers suggested that teachers who are considered exemplary were more likely to be found in schools that staffed a full-time computer coordinator that provided computer-related staff development (Bracey, 1993).

Teachers must be involved throughout all phases of designing and planning staff training to ensure that teacher needs are being met. Evaluation of staff training as well as identification for future training sessions is imperative. Teacher incentives should include opportunities for teachers to share ideas, concerns, and problems involved when implementing technology programs. Other incentives should also include some teacher

release time from the classroom to become properly trained or stipends for attending ILS workshops (Sherry, 1992a).

Effective staff training is crucial if the use of an ILS within a school environment is to reach its maximum potential. According to Siegel (1995), "sixty percent of schools or districts offer technology staff development only twice a year or less" (p. 48). School funding of technology implementation must not only include the hardware and software but adequate teacher training as well.

> Teacher inservice has to model how to use the technology in the teaching and learning process. The idea is not only to teach them how to use the hardware and software, but to integrate it seamlessly into the curriculum (Bell, 1994, p. 34).

In summary, literature regarding the advantages and disadvantages of the ILS are mixed. Some researchers and practitioners believe that the potential use of an ILS for changing learning and teaching is encouraging (Mageau, 1990; Sherry, 1990; Trotter, 1990). Others oppose the high cost of school funding to implement the program, the instructional image of a drill approach to basic-skills learning, and the increasing loss of curriculum control by teachers and administrators (Bailey, 1992; Maddux & Willis, 1992).

Becker (1992) who examined 30 studies regarding ILS use believes that the quality of research has not been good. Most of the studies contained one or more research flaws that weakened any inference regarding effectiveness of an ILS. However, Becker (1992) concluded that a wide range of effectiveness existed, and achievement gains were modest. Research regarding ILS use has continued. Results suggest that the ILS does produce positive effect on student achievement. Results also suggest that ILS use varies with different levels of implementation (Hativa & Becker, 1994). Using the results of nine

empirical ILS studies along with informal observations and interviews in eight additional schools, Van Dusen and Worthen (1992) concluded that four components were necessary for successful ILS use: (1) student time, (2) teacher involvement with the ILS, (3) ILS and classroom integration, and (4) staff training in ILS use. Each of these components is important if the effective use of an ILS is to reach its maximum potential.

According to Blickhan (1992), the amount of student learning that comes from the use of an ILS depends on (1) how the teacher uses the student information reports, (2) the kinds of instructional strategies provided, (3) student motivation, (4) the amount of student engaged time on the ILS, and (5) the balance between using an ILS and other teaching resources. Staff training is a must for effective implementation and use of an ILS.

CHAPTER III

METHODOLOGY

This chapter presents an explanation and description of the research study. It includes the rationale for the design and methodology of the study, theoretical framework, qualifications of the researcher, participants, setting, data collection procedures, data analysis, validity, reliability, and chapter summary.

Research Approval

Federal regulations and Oklahoma State University require an approval of all research studies that involve human subjects. The Oklahoma State University Research Services and the Institutional Review Board (IRB) uses this review to protect the rights of individuals involved in the research. In compliance with this policy, this research project was approved and assigned the following number: ED-00-179. This form is in Appendix A.

Introduction

The purpose of this study was to investigate the use of an integrated learning system (ILS) by teachers to determine if it was being used to its maximum potential two years after implementation. The research was conducted for the following reasons:

1. According to the literature, the number of schools who are implementing an integrated learning system is increasing. Therefore, a need exists to explore and describe whether these implemented programs are being used to their maximum potential.
2. Schools assume that the type of training provided for ILS implementation can be the same for all teachers. Therefore, a need exists to examine the views of classroom teachers regarding the training they received for effective program implementation.

Research Questions

The following questions guided this study:

1. How do teachers view their roles as facilitators of an integrated learning system?
2. What strategies do teachers employ to integrate the use of an ILS with classroom curriculum?
3. How do teachers view the training they received concerning the use of an ILS?

Rationale for Design

The purpose of this study was to investigate the current use of an integrated learning system (ILS) by teachers to determine if an ILS was being used to its maximum potential two years after implementation. In order to investigate the use of an ILS by teachers within a school setting, the researcher conducted observations and interviews

with teachers who were currently using an ILS. Data from this study was compared to the previous research findings of Van Dusen and Worthen (1992) regarding the guidelines they believed to be essential for effective ILS implementation. Since this study investigated the use of an ILS by teachers, a case study design was selected.

Case studies have been widely used throughout the educational field. "From Wolcott's (1973) classic case study, *The Man in the Principal's Office,* to case studies of students, programs, schools, innovations, teachers, and policies, this type of research has illuminated educational practice for nearly thirty years" (Merriam, 1998, p. 26).

Case studies enable researchers to explore a deeper understanding of a particular situation as well as the meaning for those involved. Developed from real-life situations, case studies provide insights and a greater understanding that add to the experiences of the readers. The results from case studies aid in the formation of future research as well as contribute to a particular field's knowledge base (Merriam, 1998). "Educational processes, problems, and programs can be examined to bring about an understanding that in turn can effect and perhaps even improve practice" (p. 41).

Case studies are suitable designs for researchers interested in process. The process that a teacher employs while using the ILS is reflective of their teaching perspectives. As previously stated in Chapter I, Van Dusen and Worthen (1992) believed that "unless ILSs are properly and adequately implemented, it is not reasonable to expect them to result in gains in achievement and affective outcomes envisioned by their developers and the adopting schools" (p.16).

Reichardt and Cook (as cited in Merriam, 1998) defined one meaning for process as "describing the context and population of a study, discovering the extent to which a

program has been implemented, providing immediate feedback, and the like" (p. 33). Therefore, a case study offered a suitable design for a researcher who was investigating the views and processes that teachers employ in the use of an ILS within a school setting.

Case studies are descriptive, interpretive, and evaluative in form. According to Merriam (1998), interpretative case studies contain descriptive data that has been used to develop "conceptual categories or to illustrate, support, or challenge theoretical assumptions held prior to the data gathering" (p. 38). An interpretative case study was an appropriate choice for the design of this study since the researcher was seeking to investigate and compare the current use of a program to findings held prior to data collection.

In summary, case studies have been widely used in the educational field in order to explore a deeper understanding of a particular situation as well as the meaning for those involved. Interpretative case studies have been used to develop conceptual categories that illustrate, support, or challenge existing theories. Therefore, since this study investigated the use of an ILS by teachers and compared the findings of this study to Van Dusen and Worthen's (1992) guidelines for effective ILS implementation, an interpretive case study was an appropriate design.

Theoretical Framework

The theoretical framework for this study was based on Van Dusen and Worthen's (1992) guidelines for effective implementation in the use of an integrated learning system (ILS). These guidelines were developed from data collected from nine empirical studies of ILSs conducted in 23 schools within ten states. They also included their own informal

observations of ILS implementation in eight additional schools. The combined data reflected the use of four different ILSs. Their conclusions were based on (1) surveys of approximately 300 teachers, administrators, and lab managers who used an ILS, (2) interviews that included individual and focus groups with over 100 principals, teachers, as well as vendor representatives, and (3) over 100 structured observations of ILS lab sessions and classrooms regarding ILS use and integration.

Van Dusen and Worthen (1992) concluded from their analysis of the data that "unless ILSs are properly and adequately implemented, it is not reasonable to expect them to result in gains in achievement and affective outcomes envisioned by their developers and the adopting schools" (p. 16). Therefore, based on their findings, Van Dusen and Worthen (1992) concluded that the following four components were essential if the use of an ILS was to reach its maximum potential: (1) student time on the ILS, (2) teacher involvement with the ILS, (3) integration of ILS with classroom curriculum, and (4) staff training in ILS use.

A review of the literature also contributed to the theoretical framework of this study as support for using Van Dusen and Worthen's (1992) guidelines to investigate the current use of an ILS within an elementary school setting. Other researchers, commentators, and practitioners suggest that effective implementation is important if an ILS is to reach its maximum potential (Becker, 1992b; Blickhan, 1992; Mageau, 1992; Sherry, 1990; Shore & Johnson, 1992).

Becker (1992a) examined more than 30 studies related to the effectiveness of ILS use in regard to student achievement. Results from the 30 studies indicated that a wide range of effectiveness existed, and achievement gains were modest. Van Dusen and

Worthen (1992) believed that since few studies found the ILS to have positive effects on student achievement or attitudes, one should consider the manner in which the ILS has been implemented. Becker (1992b) concluded from his studies regarding ILS use that "effectiveness in only partly in the instructional software; it is largely in how well teachers can use this resource to accomplish learning and competence in their students" (p. 15).

Blickhan (1992) added support to the theoretical framework concerning the role of the teacher in ILS use. Blickhan suggested that the "amount of student learning which takes place with an ILS depends on how the teacher manages student information" (p. 48). Blickhan also believes that it is important that "teachers bridge what is happening in their classrooms with the ILS lessons on some regular basis" (p. 47). This offers support to Van Dusen and Worthen's (1992) guidelines regarding the need for teacher involvement with the ILS as well as the need for integration of the ILS with classroom curriculum.

The EPIE study (as cited in Sherry, 1990) revealed that ILSs were viewed positively by the majority of students, teachers, and administrators. A second finding of the EPIE study was that most of the schools could be making more effective use of their ILSs. Sherry (1990) who was part of the 14-month EPIE study concluded that most schools were making little attempt to coordinate the students' ILS activities with the rest of the students' instruction within the school setting. This finding offers support to Van Dusen and Worthen's (1992) guidelines involving the need for proper integration of the ILS with classroom curriculum.

Another finding from the EPIE study (as cited in Sherry, 1990) was that staff training had been grossly neglected. Sherry (1990) states that 85% of the teachers had been given only two days or less of training. Data revealed that training often consisted of little more than allowing teachers to preview the ILS program. Findings from the study also revealed that most of the teachers had not received training on how to integrate the ILS into their classroom curriculum. These findings from the EPIE study support Van Dusen and Worthen's (1992) guidelines that staff training must be addressed in order for effective implementation to occur.

As previously stated, the theoretical framework for this study uses Van Dusen and Worthen's (1992) guidelines for effective ILS implementation. Support for the use of these guidelines as a means in which to investigate the current use of an ILS was also offered through a review of the literature. According to Geertz (as cited in Glesne, 1999) theory building proceeds by thick description defined as "description that goes beyond the mere or bare reporting of an act, but describes and probes the intentions, motives, meanings, contexts, situations and circumstances of action" (p. 22). Glesne (1999) states that "the goal of theorizing, then, becomes that of providing understanding of direct lived experience instead of abstract generalizations" (p.22).

According to Glesne (1999), theory can be formulated through empirical generalizations or substantive theories. Both of these theories can be found in quantitative and qualitative studies. Glesne states this kind of theory

> consists of outcomes (empirical generalizations) from related studies and mainly functions to raise questions or provide rationale for new studies, and to compare and contrast with study findings. A review of literature related to the study's main concepts provides the base for working with empirical generalizations. (p. 22)

Therefore, the findings of Van Dusen and Worthen (1992) were used as the theoretical framework for this study. Analysis of the data from this case study used analytic generalization through the use of pattern-matching logic. Patterns from this study were compared to the patterns found within Van Dusen and Worthen's (1992) guidelines for effective implementation.

Since this case study investigated the use of an ILS by teachers, only three of the components were examined: (1) teacher involvement with the ILS, (2) integration of the ILS with classroom curriculum, and (3) staff training in ILS use. Since the time frame for student ILS use met the minimum requirements for effective use, student time was not investigated in this study. Additional aspects regarding student time should be addressed in future research.

Qualifications of the Researcher

As a teacher, I have spent 28 years working with young children at the elementary level. During this time, I have experienced the adoption and implementation of various programs. Many of the adopted programs required training for implementation into the school setting that has added to my professional experience.

Through additional work at the master's level, I became certified as a Reading Specialist. I believe this additional certification has prepared me to identify the needs of students and how the various resources and programs available today can be used to meet those needs.

During the past year I received additional training through Literacy First, a program funded by the Oklahoma Commission for Teacher Preparation in collaboration

with East Central University in Ada, Oklahoma. This program was designed to help teachers focus on the needs of children in order to help them become successful readers. As a Reading Specialist, it is my professional opinion that teachers should use all available resources to ensure the success of students.

During the past two years I received staff training in the use of an integrated learning system (ILS) that was implemented in our school. Training in ILS use addressed the overall management system of the ILS used in this study. Training provided information and some hands-on experience in teacher use of reports. Training provided information in how to assist students while working on an ILS. I have conducted ILS computer lab sessions during this time with the children in my classroom. The use of an ILS during the past two years has also given me the opportunity to become familiar with the ILS program used in this study. I believe that the literature review developed for this study also increased my knowledge and awareness in use of an ILS.

In order to develop skills as a researcher, I have participated in courses that have prepared me to conduct research using observations and interviews for data collection. I have had previous field experience with conducting observations and interviews as part of course requirements. These experiences have added to the expertise that I bring to this study.

As a professional educator, as well as someone who works with children everyday, I think it is imperative that we examine the programs that are implemented within the school setting. Without an examination in how a program is being used, valuable information is lost. One way to access this information is to investigate the views of teachers who are currently using such a program.

According to Glesne (1999), qualitative research implies that the researcher may be seen as an objective middleperson. However, Glesne stated that researchers can also be seen as

> interpreters who draw on their own experiences, knowledge, theoretical dispositions, and collected data to present their understanding of the other's world. As interpreters, they think of themselves not as authority figures who get the "facts" on a topic, but as meaning makers who make sense out of the interaction of their own lives with those of research participants. (p. 157)

In order to address any researcher bias, I wrote personal reflections as part of my fieldwork experience. These reflections were written before and after each observation and interview with the participants. These writings were used to help me focus on the need to view each participant as an individual with different experiences. It provided an opportunity to reflect on how these experiences relate to each other. Writing reflections allowed me to revisit the data collected during observations and to address concerns or questions that I might have before the next observation. Writing reflections also provided the opportunity to review data collected from interviews to determine if additional interviews would be needed.

Participants

In developing a case study, Merriam (1998) suggested that the researcher should formulate criteria that will determine case selection and then select a case that meets the criteria. Criteria for a case study examining ILS use by teachers were as follows:

1. Participants were teaching in the same school setting when the ILS computer lab was implemented in August, 1997.

2. Participants used the ILS during the following two school terms: 1997-1998 and 1998-1999.
3. Participants shared similar experiences such as monitoring of computer sessions and evaluating student progress.
4. Participants were involved in similar training sessions for ILS use during the first two years of implementation.
5. Participants were currently teaching in the same school setting during the 1999-2000 school term that allowed the participants to share similar schedules and classroom curriculum.

Case studies may include more than one case. The use of a multicase approach within a study allows the researcher to conduct a cross-case analysis. "The more cases included in a study, the greater the variation across the cases, the more compelling an interpretation is likely to be" (Merriam, 1998, p. 40). Researchers often use multiple cases for enhancing the external validity or generalizability of the study. Since multiple cases allow for greater interpretation of the data and enhance the generalizability of the study, a multi-case study was used.

The participants who met the above criteria were five female, adult teachers who were teaching first grade. These participants were all Caucasian with anywhere from five to fifteen years of teaching experience. The participants had been using the same ILS for the past two school terms and were presently using the ILS program. Three of the participants received additional training in ILS management and served as members on the core committee for the K-1 elementary school. Their role as committee members was to enroll students in the ILS and assist teachers in providing some reports at various times

throughout the school year. During the first year of implementation, the members of the core committee gave assistance to any teacher who needed additional help with the ILS program.

Participants in this case study were as follows:

Teacher One was a Caucasian female who had been teaching first grade for 15 years. She was part of the core group that was responsible during initial implementation for enrolling students on the ILS, printing Parent Letter Reports at the end of each nine weeks, and assisting other teachers in using the ILS. Teacher One rated herself at mastery level in seven out of ten areas on the self-evaluation survey of basic computer use: basic computer operation, file management, word processing, graphics use, network use, student assessment, and ethical use understanding. She rated herself below mastery in three areas: spreadsheet use, database, and hypermedia.

Teacher Two was a Caucasian female who had been teaching for five years. Her first year of teaching was in second grade. The remaining four years had been in first grade where she was currently teaching. She was part of the core group for initial implementation of the ILS. Teacher Two rated herself at mastery level in eight out of ten areas on the survey of computer use: basic computer operation, file management, word processing, spreadsheet use, graphics use, network use, student assessment, and ethical use understanding. She rated herself below mastery in database use and hypermedia.

Teacher Three was a Caucasian female who had been teaching for 13 years. Her teaching experience consisted of teaching kindergarten, developmental first, and third grade. Her current teaching assignment was first grade. She was part of the core group who assisted in the initial ILS implementation. Teacher Three rated herself at mastery

level in two of the ten areas: word processing and network use. She rated herself below mastery in eight areas: basic computer operation, file management, spreadsheet use, database use, graphics use, hypermedia use, student assessment, and ethical use understanding.

Teacher Four was a Caucasian female who was currently teaching first grade. All nine years of her teaching experience had been at the first grade level. She was not part of the core group for initial implementation. On the self-evaluation survey of basic computer use, Teacher Four rated herself at mastery level in five out of ten areas: file management, word processing, network use, student assessment, and ethical use understanding. She rated herself below mastery level in the following areas: basic computer operation, spreadsheet use, database use, graphics use, and hypermedia use.

Teacher Five was a Caucasian female who had been teaching for eight years. Her teaching experience included one year in fourth grade, one year in sixth grade, and six years in her current position as a first grade teacher. She was not part of the core group. Teacher Five rated herself at mastery level in only one area of the computer survey: network use. In all other areas on the computer survey, Teacher Five rated herself at below mastery.

All teachers stated in the interviews that they were not involved in the initial planning to implement the ILS. It should be noted that the decision to implement the ILS program was an administrative decision. The principal as well as the teachers within this school setting were not consulted prior to implementation of the ILS program.

Specific information regarding the amount of training that each teacher received was not available since the training had taken place two years prior to the study. The

building principal as well as the teachers in the study believed the core group may have received three full days of training. They also believed that the teachers who were not part of the core group may have received two half-day training sessions. Two additional half-day training sessions also occurred during the first two years of implementation.

Setting

The setting for the study was a K-l elementary school that served approximately 350 students. The school was located in Oklahoma County.

The ILS computer lab was located in the school's library/media center. The ILS computer lab was comprised of approximately 23 networked computers. Computers were placed in a single row along two outer walls of the library/media center. Neither the school nor the specific ILS program used in this study was identified in order to preserve anonymity as guaranteed as a condition of obtaining school cooperation.

The ILS program used in the study was a comprehensive, interactive, software program. The students who used the ILS in this study worked on the ILS in the areas of reading, math, and language arts. Students were provided with individualized lessons in each one of the three areas. Each of the areas presented on the ILS provided students with skill practice. Student performance on the ILS was recorded through the management system of the ILS. As students mastered the various skills, they advanced to the next level. Review of those skills not mastered by a student would continue to be presented until the student had sufficiently mastered them. Review of mastered concepts or skills would reappear throughout the lessons. Wilson (1990) stated that skills-based programs, such as the one used in this study, are designed primarily to "provide

diagnostic/prescriptive intervention for remediation of precise skills (such as proper decoding of digraphs as a reading skill)" (p. 23).

Detailed diagnostic reports of a student's performance in individual skill areas were provided with this particular ILS. The file management system of the ILS used in this study provided the following reports:

1. Today's Session Report: printed the students' score for each session.
2. Course Report: provided overall areas of strengths, weaknesses, and progress level of students in reading, mathematics, and language.
3. Custom Reports: provided several reports regarding student performance such as grouping reports, grouping by strands or progress level, learning groups, total gains, and parent letters.
4. Cumulative Report: provided information regarding students' total progress in reading, mathematics, and language.

The management system of the ILS involved in the study monitored each student's performance and adjusted the content of the material being presented based on the student's mastery of objectives. The management system allowed teachers to adjust the program level to meet student needs. Teachers could also use the ILS management system to meet classroom objectives. For example, if a teacher was introducing money recognition in the classroom, she could program a short lesson related to money on the ILS. The students could then use the first part of the lab session to practice money recognition on the ILS before starting their individualized programs.

Each teacher in this particular school setting had the responsibility of bringing her own classroom of students to the media center for the ILS computer lab session.

Teachers were to monitor their students as they worked on the ILS. The media specialist and library aide who worked in the media center were also there to offer assistance to teachers if equipment problems or computer glitches developed. The role of the media specialist and library aide was to only assist the teachers and students as needed and not to conduct the lab sessions. Additional help from the media specialist and library aide could be given to teachers as needed regarding the printing of student performance reports.

Each lab session involved practice in reading, math, and language. Students spent approximately eight to ten minutes in each subject area during a lab session. Students attended the computer lab for a 30-minute session two times one week and three times the following week. Any sessions that were missed were not made up at a later time.

Procedure of Study

The study was conducted during the spring semester of 2000. The procedures were followed in this order for the study:

1. Completion of consent form and self-evaluation computer survey
2. Three observations of each participant during computer sessions
3. Interviews with participants
4. Follow-up interviews with participants, if needed.

During the first two weeks of the study, the researcher received written consent from the superintendent and principal to conduct the study within the school setting. This form can be found in Appendix B. Each participant was also informed about the study. Consent forms were signed at this time if they agreed to participate. See Appendix C for

consent form. A copy of the signed consent form was given to each participant. Each participant was also asked at this time to complete a self-evaluation survey related to basic teacher computer use. This self-evaluation form can be found in Appendix D.

Throughout the next six weeks of the study, observations of participants during lab sessions were conducted. Three observations of each participant were conducted. The researcher kept running records of the participants as lab facilitators during ILS sessions with students.

After observations were completed by the researcher, the next five weeks of the study involved interviews with each participant concerning their use of the ILS. Follow-up interviews were to be conducted by the researcher if needed.

Data Collection

The purpose of this study was to investigate the use of an integrated learning system (ILS) by teachers two years after implementation. The study was conducted to see if an ILS was being used to its maximum potential based on previous research findings. Van Dusen and Worthen (1992) identified the following three components they believed to be essential in the effective use of any ILS: (1) teacher involvement with the ILS system, (2) integration of the ILS into classroom curriculum, and (3) staff training in ILS use. The following questions guided this study:

1. How do teachers view their roles as facilitators of an ILS program?
2. What strategies do teachers employ to integrate the use of the ILS with classroom curriculum?

3. How do teachers view the training they received concerning the effective use of an ILS?

From their findings, Van Dusen and Worthen (1992) made an assumption regarding the need for staff training in ILS use. They believed that teachers with the greatest familiarity and comfort level with the computer would be the teachers who would be most effective in implementing the ILS.

Since none of the studies throughout the literature surveyed the teachers regarding their personal use and familiarity with computer operations, the researcher believed it was important to establish the level of computer experience for each of the participants. Therefore, each participant was asked to complete a self-evaluation survey of basic teacher computer use. Data from this self-evaluation survey of basic computer use was also used when analyzing other data from the study related to teacher involvement with the ILS. The researcher was interested in seeing if patterns existed between teacher involvement with the ILS and basic computer use by teachers. Therefore, each participant was asked to complete a self-evaluation survey of basic computer use during the first two weeks of this study.

The self-evaluation survey (see Appendix D) was a technology survey from the Educator's Guide to Evaluating the Use of Technology in Schools and Classrooms (1998). Teachers in the study rated their level of achievement in basic computer operation, file management, word processing, use of spreadsheets, databases, graphics, hypermedia, network, student assessment, and ethics.

The survey asked the participants to circle one of four levels of achievement for each area given. For example, four levels of achievement were given in basic computer

operations: Level 1, Level 2, Level 3, and Level 4. The participants read the description achievement for each level and circled the appropriate response. The results of the survey were analyzed in relation to other data collected in the study from observations and interviews with the participants.

Van Dusen and Worthen's (1992) guidelines stated that "effective implementation requires that teachers be involved with their students while they work on the ILS" (p.18). Their study revealed two behaviors that were crucial for the ILS implementation:

> (1) teachers serving as a resource to students while working on the ILS (responding to student problems in the lab or monitoring use in the distributed setting); and (2) teachers actively monitoring student progress while students are working on the computers. (p. 18)

The following research question addressed teacher involvement with the ILS:

How do teachers view their roles as facilitators of an integrated learning system (ILS)?

After the completion of the self-evaluation survey by participants, the researcher conducted a series of observations of the participants as they monitored students during computer sessions. According to Merriam (1998), observation data offers the researcher firsthand experiences with the phenomenon being studied and are conducted for several reasons. The researcher notices things about the phenomenon being studied that the participants consider routine. These observations can add meaning and lead to a deeper understanding of the context. Observations can provide specific incidents, behaviors, and the like that provide reference points for additional interviews with participants.

In order to investigate teacher involvement with the ILS, data was collected through fifteen observations of the participants during 30-minute computer sessions.

Each participant was observed during three different computer sessions. More than one observation of each participant was conducted in order to collect sufficient data. The researcher recorded the observations through the use of field notes. Field notes were recorded as running records in order to record the behaviors exhibited by the participants as they monitored their students during an ILS session. Field notes were transcribed and typed as soon after the observation as possible by the researcher.

Observations were also conducted as a means of providing triangulation within the study. Observations can be used in conjunction with interviews to substantiate the findings of a study (Merriam, 1998). Since observations serve to aid in collecting data not otherwise provided through interviews, observations of teachers using an ILS within a computer-lab setting was an appropriate method of data collection for the study.

In order to investigate whether an ILS was being used to its maximum potential, the researcher used interviews with the participants as the primary source of data collection. Interviewing enables the researcher to collect data that might otherwise be hard to ascertain through other instruments (Merriam, 1998). Since this study was investigating the use of an ILS by teachers, interviewing teachers in order to obtain their views regarding their use of an ILS was an appropriate method.

Interviews can be conducted in three ways: highly structured, semistructured, and unstructured/informal. This study used semistructured interviews.

"Less structured formats assume that the individual respondents define the world in unique ways" (Merriam, 1998, p. 74). Questions which aid in accomplishing this endeavor are more open-ended. Therefore, a less structured approach to interviews is the semistructured interviews. "In this type of interview either all of the questions are more

flexibly worded, or the interview is a mix of more and less structured questions" (Merriam, 1998, p. 74).

> According to Berg (1995), a semistructured interview involves the implementation of a number of predetermined questions and/or special topics. These questions are typically asked of each interviewee in a systematic and consistent order, but the interviewers are allowed freedom to digress; that is, the interviewers are permitted (if fact expected) to probe far beyond the answers to their prepared and standardized question. (p. 33)

Glesne (1999) supports the use of interviews in order to gain information about opinions, perceptions, and attitudes toward some topic. This type of interviewing, known as topical interviewing, focuses more on an issue, program, or process rather than on people's lives. Since the purpose of this study was to investigate the use of an ILS by teachers to determine if the ILS was being used to its maximum potential, interviews were conducted to obtain the views of teachers concerning their use of an ILS computer program.

Interview questions (see Appendix E) were designed to investigate the views of teachers regarding their use of an ILS in the following three areas: (1) teacher involvement with the ILS, (2) integration of an ILS with classroom curriculum, and (3) staff training. Interview questions were designed to elicit the teacher's use of the ILS concerning the monitoring of lab sessions, serving as a resource person in the lab, and integrating the use of ILS with classroom curriculum. Other questions in the interview related to the use of management features of the ILS such as student progress reports and the flexibility feature of the ILS for teachers to alter ILS sessions.

Some general questions were included in order to gain the teachers' overall view of the ILS used in the study. Such questions asked the teachers to state their views

concerning the strengths and weaknesses of ILS use. Teachers were also asked to express their views concerning ILS training. Participants were asked to participate in follow-up interviews if necessary. Data collected from the interviews were analyzed and compared with the results of the observations to see if any patterns existed.

The interviews were conducted after school in an empty classroom. The interviews were conducted in one setting with each participant. With participants' permission, all interviews were taped using an audio tape recorder. Interviews were transcribed and checked with the audio tape for accuracy. The transcripts and audio tapes were given to the researcher's adviser to check for authenticity. The transcripts and tapes were kept in a locked, secure office by the researcher.

To ensure the confidentiality of the participants, the identity of the participants remained anonymous in the study and were identified only as Teacher One, Teacher Two, Teacher Three, Teacher Four, and Teacher Five. Data collected in the study were stored separately from identifiers. Data were destroyed following the completion of the study as required by the IRB.

During the study, the researcher kept accurate records of when the survey, interviews, and observations were conducted. Field notes were recorded throughout the study to include additional information concerning occurrences, thoughts, and experiences of the researcher throughout the study.

Data Analysis

Multi-case studies use the method of analytic generalization to analyze data. According to Yin (1994), this method uses a previously developed theory as a template in

which to compare the results of a current study. In this study, the theoretical framework consisted of the use of empirical generalizations or substantive theories that consisted of outcomes from related studies. In this study, Van Dusen and Worthen's (1992) findings regarding the effective implementation of an ILS formed the theoretical framework. These findings served as the template in which to compare the findings from this study.

According to Yin, (1994), if two or more cases within a case study are shown to support the previously developed theory, theoretical replication may be claimed, and theory has been validated. Yin (1994) stated that there are several techniques that can be used in analytic generalization. These techniques are pattern-matching logic, explanation-building, time-series analysis, and program logic models. This study used pattern-matching logic as the mode of analysis.

In this study, the researcher analyzed the data into categories related to teacher involvement with the ILS, integration of the ILS with classroom curriculum, and staff training in ILS use. Data from the observations and interviews were broken down into the various categories and were termed as patterns. Previous findings from Van Dusen and Worthen's (1992) studies were also broken down into patterns within the various categories. Pattern-matching logic consisted of analyzing the patterns found in the data from this study to the patterns found in the previous findings of Van Dusen and Worthen (1992). Analysis of the patterns within the data can be found in Chapter IV under the sections entitled: Areas of Agreement and Areas of Disagreement.

Data from the self-evaluation survey can be found in Appendix F. An overall presentation of the data from the self-evaluation survey is presented in this chapter during the introduction of participants. Specific analysis of this data is also presented in the

analysis sections of Chapter IV under the areas of agreement and disagreement with the findings of Van Dusen and Worthen (1992).

Data from the self-evaluation survey were analyzed for patterns related to teachers' basic use of computers. For example, data were analyzed for patterns regarding teachers in this study that were below mastery level in basic computer operations. Data from this survey were also analyzed for patterns related to the teachers in this study that were below mastery level in file management. These patterns were then analyzed to the patterns found in the findings from Van Dusen and Worthen (1992) related to teacher involvement with the ILS. These patterns were also analyzed with other patterns found in the observation and interview data related to teacher involvement as a way of triangulating the data from the current study.

Patterns within the data collected from the self-evaluation survey were also analyzed with patterns found in the data related to integration of the ILS with classroom curriculum. For example, patterns from the self-evaluation survey data were compared to patterns found in the interview questions related to the use of the file management system by teachers to resequence lessons on the ILS to match classroom curriculum.

Patterns from the self-evaluation survey were analyzed and compared to the patterns found in the data from interviews questions related to staff training. For example, data from teacher responses to interview questions regarding staff training were analyzed for patterns related to the teachers' descriptions of the training that the teachers received. Patterns from this data were compared to the patterns found in the data from the self-evaluation survey of basic computer use. Analysis of patterns are presented in

Chapter IV under areas of agreement and disagreement with Van Dusen and Worthen's (1992) findings.

Data from the observations of teachers using the ILS during lab sessions are presented in Chapter IV. Data from the observations were analyzed for patterns relating to teacher involvement with an ILS and integration of the ILS with classroom curriculum. Patterns from the observation data were compared to the findings of Van Dusen and Worthen (1992). Patterns from the observation data were analyzed and compared with the patterns found in the data from interviews with the teachers regarding teacher involvement with the ILS as a means of triangulating this study.

Conducting interviews with teachers who use an ILS was the main source of data collection. Data collected from the interviews were organized and analyzed according to the participant's response for each question asked in the interview and presented in written form in Chapter IV using direct quotes from the participant's responses to the interview questions as support.

After the interviews were transcribed, the researcher conducted a process of breaking down the data in various categories regarding (1) teacher involvement with an ILS, (2) integration of the ILS with classroom curriculum, and (3) staff training in the use of an ILS. Analysis of data collected through interviews with teachers was also conducted through the use of analytic generalization. This analysis was accomplished through the method of pattern-matching logic.

The researcher analyzed patterns within the data from the interviews and compared these patterns to the patterns found in the previous findings of Van Dusen and Worthen (1992). Areas of agreement and disagreement with the findings of Van Dusen

and Worthen (1992) were established. Analysis of the data from the interview questions is presented in Chapter IV under areas of agreement and disagreement.

Validity and Reliability

Merriam (1998) suggested several strategies that researchers should employ to address validity and reliability. This study addressed validity through triangulation, member checking, and peer examination. Triangulation was accomplished in this study through the use of a self-evaluation survey of basic computer use by teachers, interviews, and observations. The use of multiple data-collection (triangulation) methods contributed to the trustworthiness of the data. Using this method allowed the researcher to compare the data collected from observations to the data collected from the interviews.

Validity of the study was increased through peer review (Merriam, 1998; Glesne, 1999). The researcher remained in frequent contact with the researcher's adviser in order to gain external reflection and input on the researcher's work.

Validity was also established through member checking (Merriam, 1998; Glesne, 1999). After the data from the observations and interviews were collected and transcribed, the researcher asked the participants to read the transcriptions related to their observations and interview to determine if the data reflected an accurate account of the participants' views as well as their use regarding the ILS.

Reliability of the study was established by the keeping of accurate records that explained how the results were obtained. Recorded dates of interviews, observations, transcribed notes along with audio tapes added to the reliability of the study.

External validity was addressed through the use of analytic generalization. The issue of generalizability was enhanced as empirically-based patterns were compared to an established theory (Yin, 1994).

Summary

According to the literature, schools are purchasing computers and implementing computer programs such as an ILS. Professional educators need to ask if these programs are being used effectively. Therefore, a need existed to examine whether implemented programs such as the ILS are being used to their maximum potential by teachers to assist students in their educational endeavors.

The purpose of this study was to investigate the current use of an integrated learning system (ILS) by teachers to determine if an ILS was being used to its maximum potential two years after implementation. This study used Van Dusen and Worthen's (1992) guidelines on effective use of ILSs as a basis for the theoretical framework. The researcher used a case study design that allowed the researcher to explore a deeper understanding of the situation as well as the meaning for those involved. The case study was interpretative in nature (Merriam, 1998).

This case study was multicase in design to increase external validity and to allow for cross-case analysis. The multicases consisted of five, female teachers who were currently using an ILS in a K-1 elementary school. A self-evaluation survey of basic teacher computer use, interviews, and observations formed the basis of the case study. Pattern-matching logic was the mode of analysis. The case study utilized the methods of Merriam (1998) and Yin (1994) for design.

CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA

The purpose of this study was to investigate the use of an Integrated Learning System (ILS) by teachers within an elementary school setting. The results of this study were compared to the previous findings of Van Dusen and Worthen (1992) in order to determine if the ILS was being used to its maximum potential two years after implementation.

This case study involved five female teachers who had used the ILS for two years and had received similar training. Methods of data collection involved observations of teachers during ILS computer sessions, interviews, and completion of a self-evaluation survey by each teacher regarding basic computer use.

The following research questions guided the study:

1. How do teachers view their roles as facilitators of an ILS program?
2. What strategies do teachers employ to integrate the use of the ILS with classroom curriculum?
3. How do teachers view the training they received concerning the effective use of an ILS?

A discussion of these research questions that guided this study are addressed throughout Chapter IV under the sections titled Analysis of Data. A final summary of the

conclusions regarding these questions is presented in Chapter V. Chapter IV includes a presentation and analysis of the data. The chapter is organized into three major sections: presentation of data from the self-evaluation survey, presentation of data from observations, and presentation of data from interviews.

First, the data from the self-evaluation survey of basic teacher computer use are presented. It presents the data depicting the total number of teachers who considered themselves to be either at the mastery level or below mastery level in each of the separate categories given on the survey.

Next, the observation data are presented. Teachers were observed as they conducted ILS sessions. Observations of teachers incluced teacher involvement with the ILS and integration with classroom curriculum. A summary of the three observations is given for each teacher in the study.

The last section in Chapter IV is a presentation of the data collected from the interviews. Teacher responses are collectively organized according to the interview questions.

An analysis of the data follows each section and can be found in each section entitled: Analysis of Data. Data analysis consisted of examining, categorizing, and analyzing the data in order to compare the data from this study to the previous research of Van Dusen and Worthen (l992) regarding effective ILS use. The data was analytically generalized to the findings of Van Dusen and Worthen through the use of pattern-matching logic. After the data was broken down into patterns and compared with the guidelines for effective implementation of Van Dusen and Worthen, areas of agreement and disagreement were determined. Three major categories were used in presenting

and analyzing the data. The three categories were Van Dusen and Worthen's (1992) guidelines for effective implementation: (1) teacher involvement with the ILS, (2) integration of the ILS with classroom curriculum, and (3) staff training in ILS use.

Presentation and Analysis of Data from the Self-Evaluation Survey of Basic Teacher Computer Use

Data Presentation of Self-Evaluation Survey

The self-evaluation survey used in this study was from the Educator's Guide to Evaluating the Use of Technology in Schools and Classrooms (1998). Teachers in the study rated their level of achievement (Table I) in basic computer operation, file management, word processing, use of spreadsheets, database use, graphics use,

TABLE I

TEACHER RATINGS (N=5)

Area	Number of Teachers Below Mastery	Number of Teachers Above Mastery
Basic Computer Operation	3	2
File Management	2	3
Word Processing	1	4
Spreadsheet Use	4	1
Database Use	5	0
Graphics Use	3	2
Hypermedia Use	5	0
Network Use	0	5
Student Assessment	2	3
Ethical Use Understanding	2	3

hypermedia, network use, student assessment, and ethical use understanding. Levels One and Two were considered below mastery. Levels Three and Four were considered at mastery level. Specific teacher ratings in each area can be found in Appendix F.

Data Analysis of Self-Evaluation Survey

Data were analyzed for patterns of basic computer use by teachers. Patterns within the data suggest that three out of five teachers were below mastery in basic computer operations. Two out of five teachers were below mastery in file management. The effective use of an ILS requires teachers to use some basic computer operations as well as a file management system. Teachers who exhibit a below mastery level in these two areas may have difficulty in implementing an ILS. Two areas that contained the greatest number of teachers at mastery level were word processing and network use.

Presentation and Analysis of Data from Field Observations

Data Presentation of Field Observations

Van Dusen and Worthen's (1992) studies revealed that "effective implementation requires that teachers be involved with their students while they work in the ILS" (p.18). They concluded that three behaviors of teachers were crucial for effective ILS implementation:

> (1) teachers serving as a resource to students while working on the ILS (responding to student problems in the lab or monitoring use in the distributed setting); (2) teachers actively monitoring student progress while students are working on the computers; and (3) teachers using reports generated by the system. (p. 18)

Each teacher was observed on three different occasions as they worked with students during ILS sessions. The following data presentation represents a summary of the three observations for each teacher. Observations of the participants during computer sessions revealed the following:

Teacher One

During all three observations, Teacher One constantly walked throughout the ILS computer lab monitoring students and serving as a resource person. As students worked on the ILS, they were to place a blue plastic cup on the top of their computer tower as a signal to the teacher if assistance was needed. Teacher One served as a resource person by assisting students with the volume on the headset and computer glitches on the screen. She also gave assistance to students who signaled for help by giving them further instructions regarding their work on the ILS. When assisting students, she used a direct questioning approach such as: "How many red balls? How many bats?" She continued through a series of questions until the students solved the problems. At other times, she would explain the concept and then ask the students what they thought. After the students answered, her reply would be "Try that one and see if that's right." She then continued circulating throughout the lab.

On one occasion during the three observations, Teacher One assisted a student who was working on graphing and stated, "We've been doing this in class." This was the only time during the observations of this teacher that a reference related to a classroom activity regarding an exercise on the ILS was observed.

During the time that students were not signaling for assistance, she actively monitored students by asking various students if they needed any help instead of waiting to be signaled. She worked with students in a positive manner. While working with one student regarding estimation, she replied, "Try and see, you might be right. Wow! You were right. Pretty good guess." The students worked quietly on the ILS and appeared to be focused on their program.

At the end of the sessions, Teacher One printed a report called Today's Session from the file management system. This report listed the number of problems worked by each student, the number of problems that were worked correctly, and a total score for that session.

Teacher Two

At the beginning of each session, Teacher Two verbally set a goal for the class to work toward during that session. The goal was to achieve a certain number of correct answers during the session. During each session, Teacher Two walked around continuously monitoring the students. She served as a resource person as she assisted students with the headphones, computer glitches, and use of the computer mouse. She often answered student signals by kneeling down next to them and speaking softly as she used the computer screen as a visual to aid in further explanation to the student. Sometimes she would listen through the headset, and other times she and the student would read the exercise together. One student needed help in math. She re-explained the exercise in a step-by-step process as she guided the student through the problem using a direct questioning technique.

There was one occasion during the three sessions when Teacher Two made a connection to a classroom experience. One student was working the following exercise on the computer: 9 ones = ___ . She assisted by saying, "Think about our straws. How much is 9 straws?" This comment was in reference to the class counting straws on the calendar board each morning in their classroom.

During the time that the students were not signaling for help, Teacher Two was constantly walking in order to actively monitor all of the students. She would stop by students to watch their progress and relate a positive comment to the students such as: "Good job; That's awesome; You're thinking about numbers; You just divided; That's third grade stuff." Other times she would stop and touch a student on the shoulder to focus him/her back on task. She returned to students she had previously helped in order to see how they were doing. The students were constantly working during the ILS sessions. They appeared to be involved in their program and worked well with the teacher.

At the end of each computer session, Teacher Two printed a copy of the Today's Session Report from the ILS management system. Teacher Two stated that she prints a report for each session since goals for the students are set at the beginning of their ILS work. She discusses the report with the students as soon as they return to the classroom. Students who meet the goal for that day receive a sticker.

Teacher Three

During all three observations, Teacher Three served as a resource person by helping students log on to the computer when needed, assisting with computer glitches,

and helping with headphone difficulties. She was watchful about students signaling for help and attempted to give them assistance as soon as possible. She always spoke softly to the students. At times she bent down next to the students as she worked with them. Sometimes Teacher Three used the computer monitor as a visual aid to offer further explanations to students. Other times she assisted students by saying, "There are different ways you can work this." She then continued asking questions to guide the student through the process.

This particular group of students appeared to enjoy seeing their ILS score. They often checked their score and wanted to report the score to their teacher. As students shared their score with the teacher, she responded to them with "Okay." Teacher Three stated during the observation that she wished they would not call her over just to show her their score. She also commented that the students wanted to show her what they found on their computers such as a spelling word or something else that they recognized from class. However, she did not respond with much enthusiasm when the students did this.

Teacher Three did not participate in actively monitoring students. She walked around during the time that students were not signaling for assistance. As she walked around, she occasionally stopped behind a student and just watched without any response to the student. Some students never signaled for assistance with their blue cup. These students did not receive any response from the teacher. As Teacher Three walked around the ILS lab, she encouraged one student to turn around and work. Two students were observed visiting with each other, so the teacher placed a large partition between their computers.

Teacher Three was observed for use of ILS reports. She closed the sessions without printing any reports from the ILS management system.

Teacher Four

Teacher Four was efficient at getting her class logged in and working. She served as a resource person throughout the three observations. As students required assistance, she bent down next to the child and asked guiding questions as a way to help students in their selection of an answer. As students began completing certain sections on the computer, Teacher Four passed out stickers to students who made 100 %. During the three observations, Teacher Four answered signals and passed out stickers.

One example of a connection with classroom curriculum was observed as the teacher helped a student with an exercise on the ILS regarding tens and ones. Even though the computer monitor showed blocks of tens and one, the teacher related the problem to activities related to money that had been used in the classroom. Teacher Four commented that the students understood the concept of tens and ones better by using activities related to money as opposed to the use of blocks.

Teacher Four served as a resource person by answering student signals. However, her participation in active monitoring of students was minimal. She did respond to the students in a friendly and positive manner as she gave them stickers for their ILS work. She responded to the students with comments such as "Good job." During the time that students were not signaling, she either stood by the bookshelf or walked around to watch the students. During this time, however, there was minimal conversation between students and teacher.

Teacher Four was observed for use of reports. She ended the sessions without printing any reports from the ILS management system.

Teacher Five

During the three observations of Teacher Five, she was engaged in writing lesson plans or grading papers as the students worked quietly on the ILS. The first few student signals were to request stickers for their grade in completing more than 15 exercises correctly. Teacher Five stopped her work and smiled at the students as she passed out stickers. As student signals began to emerge more frequently to receive a sticker, it became difficult for Teacher Five to get to some of the students before their score disappeared from the computer screen. As soon as Teacher Five finished giving out stickers, she returned to grading papers or writing lesson plans. Teacher Five made the comment during an observation that it did not work well to give the stickers to the students after they returned to the classroom because she often forgot to pass out the stickers upon return to the classroom.

During each of the three observations, only three or four students signaled for assistance regarding exercises on the ILS. Teacher Five bent down next to the students and used short direct statements to give assistance such as "Did you count them?" (Yes.) "Type in five. Count again."

She intermingled grading papers and lesson plans with walking around the room monitoring student behavior. She made such comments as: "Sit up; Get busy; Keep working." She served as a resource person by answering student signals. After answering student signals, Teacher Five returned to grading papers and lesson plans.

Therefore, Teacher Five was not observed in active monitoring of students as they worked on the ILS.

Teacher Five was also observed for the use of ILS reports. During the three observations, she did not print reports from the ILS management system. See Appendix G for summary of observation data regarding teacher involvement with the ILS.

Data Analysis of Field Observations

Areas of Agreement – According to Van Dusen and Worthen (1992), "effective implementation requires that teachers be involved with their students while they work on the ILS" (p.18). This involvement includes teachers responding as a resource person to student problems and needs as they work on the ILS. Teachers also need to actively monitor the students' progress as they are working on the ILS and not just when signaled. Teachers should also use reports generated by the program's management system to monitor students' progress.

Data were analyzed for patterns of teachers acting as a resource person and actively monitoring students. All five participants served as a resource person by helping students as they signaled for assistance. They helped with computer glitches and offered further explanations to assist the students' understanding of a concept. However, during the time that students were not signaling for assistance, three of the teachers engaged in such activities as grading papers, working on lesson plans, monitoring student behavior, waiting for the next student to signal, and watching a student without any teacher involvement in order to keep him/her on task. Two teachers actively monitored students

in between student signals. They continuously circulated throughout the computer lab and visited with students regarding their work on the ILS.

Patterns of teacher behavior found in the observation data were compared to patterns found in Van Dusen and Worthen's (1992) findings. Their findings revealed that "few teachers actively monitored student progress and only reacted when students signaled that they needed help" (p.18). According to Yin (1994), if two or more cases are shown to support the same theory, theoretical replication may be claimed, and theory has been validated. In this study, only two teachers actively monitored while three teachers did not. This pattern matches with Van Dusen and Worthen's (1992) findings regarding teacher involvement with the ILS.

Teacher involvement also includes the use of reports generated by the ILS management system. Observation data was analyzed for patterns of teacher involvement through the use of ILS reports. Patterns suggested that three of the teachers in this study did not print any reports at the conclusion of the sessions. Two of the teachers printed a report called Today's Session at the conclusion of each session. This pattern matches the findings of Van Dusen and Worthen (1992). Their findings revealed that less than half of the teachers used the reports on a regular basis. "This low level of report usage means a potentially important aid in keeping track of student performance, and individual needs is being wasted" (p. 18).

Van Dusen and Worthen's (1992) findings revealed the following pattern: nearly three-fourths of the teachers surveyed believed that the ILS should be used as a supplement. One research question that guided this study was the following: What strategies do teachers employ to integrate the use of the ILS with classroom curriculum?

During the observations, the researcher looked for ways that teachers integrate ILS use with a classroom curriculum. Only three references to classroom activities by teachers were observed. The results from this study suggested that a pattern of minimal integration of ILS use with a classroom curriculum existed. Patterns within the data suggest the ILS within this school setting is being used as a supplement as opposed to an integrated part of the basic curriculum.

Areas of Disagreement – Observation data were analyzed for patterns related to teachers doing the following: serving as a resource, actively monitoring students, using ILS reports, and connecting ILS work of students to classroom curriculum. None of these patterns were found to be in disagreement with Van Dusen and Worthen's (1992) guidelines for effective ILS use.

Presentation and Analysis of Data from Interview Questions

This section of Chapter IV presents the responses from each teacher regarding the interview questions that were used in the study. Each major interview question as well as the probing questions are presented and followed by the responses of each of the five teachers in this study. Analysis of data follows each major interview question.

Interviews were used as a means of data collection. Interview questions were designed to investigate the views of the teachers regarding their involvement with the ILS, integration of the ILS with classroom curriculum, and staff training regarding the use of an ILS.

Interview Question One

The first question of the interview was designed to elicit each participant's overall view of the ILS program. Question one was as follows: How would you describe the effectiveness of an Integrated Learning System (ILS) on student learning? (a) What do you consider to be the strengths, if any, of the ILS program? (b) What do you consider to be the weaknesses, if any, of the ILS program? (c) Were you involved in the initial decision to implement an ILS program?

Presentation of Data – Question One – Teacher One described the effectiveness of the ILS as another mode of learning and saw it as positive for students who are visual/auditory learners. She considered the strength of the program to be its spiraling effect. She described this effect as assessing the students and moving them to a higher or lower level as needed.

Teacher One considered one weakness of the ILS program to be in the sequencing of skills. She commented that accelerated students encounter new concepts on the ILS before they are introduced in the classroom. She gave the example of tens and ones. She stated that the concept was not explained well enough on the ILS for most students to work the problem without manipulatives before it was introduced in the classroom. Teacher One stated she tries to address this need through small group or whole group instruction when this occurs.

Teacher One was asked if she was involved in the initial decision to implement an ILS program. She stated she was not involved in the initial decision to implement an ILS but served on the core committee after the system was in place.

Teacher Two described the ILS as "an effective teaching tool if there is a teacher to provide instruction when students get to something new that they don't understand." She thought the ILS was good at reinforcing what students had been taught as well as extending the student's knowledge, but that students needed extra instruction when they encountered new concepts. She considered a strength of the ILS to be "that all students can be working at their own level." She liked the teacher reports generated by the ILS.

Teacher Two considered a weakness to be in the one format presentation. She stated that "if they don't get the instruction in that format, they need a teacher there to try and approach it from a different angle to relate it to things." She also stated that she was not involved in the decision to implement the ILS but was part of the core group once the program was implemented.

Teacher Three considered the program to have some good information but considered the ILS program monotonous. She stated she believed that student scores on the ILS were not accurate. The students in her class who attended a reading lab as low readers showed high scores on the ILS. She believed this was because the skills were isolated and not applied. She believed the program "gave students time on the computer to learn the keyboard and use of the computer mouse, but not a whole lot else." However, she stated that she did not know if that could be considered a strength of the program.

Teacher Three believed a weakness of the ILS to be that it was monotonous. She stated she was not involved in the decision to implement the ILS. When asked if she would have liked to have been involved in the decision to implement an ILS, she replied "No." However, after the system was in place, she was part of the core group.

Teacher Four considered the effectiveness of the ILS to be in reviewing of skills that have been taught. She believed a strength of the ILS to be that "all the skills that are on the program are reviewed until mastered." She did not consider the program to have any weaknesses except perhaps with the hardware. She stated that sometimes the hardware did not work properly. Teacher Four was not involved in the decision to implement the program and was not part of the core group after the system was in place.

Teacher Five stated that she feels the program is a very good program. She liked the fact that "each child can work at their own individual pace." She believed the math and reading of the ILS program correlated with the school's curriculum. She considered a strength of the ILS to be in its use as another tool for student learning. She believed that most of the students enjoyed working on the computer. She considered the fact that students had access to clicking out of a program before they were finished to be a weakness. Teacher Five stated she was at the school site when the program was implemented, but she was not part of the core group.

Analysis of Data – Areas of Agreement – Van Dusen and Worthen (1992) did not specifically address how teacher views relate to ILS use. Therefore, the data was analyzed for patterns of agreement among the participants in this study. Four of the teachers expressed positive comments regarding the use of an ILS even though they were not involved in the decision to implement an ILS. Positive comments regarding the ILS included: positive experience for students, a tool for student learning, individualized pacing for students, and skills review. Three of the teachers stated a one-format program to be a weakness of the ILS.

Analysis of Data – Areas of Disagreement – Van Dusen and Worthen (1992) believed that effective use of the ILS required teacher "buy-in" (p. 20). Their results indicated that less than 3% of teachers were involved in the decision to buy an ILS. They believed this low level of participation by teachers contributed to a non-commitment to see the program succeed. Data from this study suggest that most of the teachers were positive about the ILS even though they were not part of the decision-making process.

It should also be noted that Teacher Three believed the ILS program to be monotonous. She stated the program provided the students with some time on the computer and practice using a computer mouse, but not a whole lot else. She was not part of the decision-making process to purchase the ILS. When asked if she would have liked to have been part of the process, she replied "No."

Interview Question Two

The second and third questions pertained to teacher involvement with the ILS. Question two was as follows: How would you describe the role of the teacher during an ILS lab session? (a) Describe what a typical lab session would be like for you. (b) What do you do during an ILS lab session if you observe a student having difficulty understanding a particular skill? (c) What do you do during the time that students are not signaling with their blue cups? (d) How is the seating arrangement in the ILS computer lab determined for your class? (e) Does the seating arrangement ever change?

Presentation of Data – Question Two – Teacher One described the role of the teacher as one of "management of the program." Management of the program included

helping students log in on the computers and assisting students with problems. She described a typical session as students working on their own program in reading, math, and language. As each student signals with a blue cup, she offers assistance. If she observes a student having difficulty understanding a particular skill, she tries to "explain it in a different way from the computer." During the time that students are not signaling for assistance, Teacher One stated that "she is usually walking back and worth to make sure that they're actually doing what they're supposed to be." She checks to "make sure they are in the right program, working to their benefit, and not wasting time." She considers the role of the teacher to be more of a management role. She stated the students do not have assigned seating in the ILS computer lab. If an adjustment in the seating arrangement occurred, it was related to students who were too talkative, excessively noisy, or needed a lot of help. She stated she "might put them in the (computer) room where it's easier for them to be seen in all parts of the room."

Teacher Two described the role of the teacher as an active role. She stated "this program isn't designed for teachers to go and sit and grade papers or do anything else other than just circulate and help kids as they have difficulty and trouble shoot." She believed the ILS lab could really use two teachers with 20 students in order to be able to circulate and meet student needs. She described a typical session as helping students to log in on the computers, motivating students by setting goals, helping with computer glitches, and giving "students one-on-one instructions as they encounter new concepts or concepts they don't remember from the classroom." She also stated she ran reports each session in order to see what type of accuracy the students were having. As she observes students having difficulty on the computer, she offers assistance by trying to relate it to

how it was taught in the classroom. For example, if students were having difficulty with tens and ones, she would relate it to how they had counted groups of straws during calendar time in the classroom. While students are not signaling for assistance, she stated she walks around and makes sure that students are on task by trying to redirect and refocus them.

During ILS sessions, Teacher Two stated that she uses an alternating boy-girl seating arrangement. She seats students who are having difficulty in the middle section of the computer lab in order for her to conveniently assist them. Teacher Two also commented that she makes modifications in the seating arrangement throughout the year as needed.

Teacher Three described her role during the ILS computer session as a monitor. She considered this role to be "basically checking to make sure that the students are working." As she observes students having difficulty, she stops the program and gives them other examples that are not on the monitor in order to show them what to do. She stated even though she attempts to explain it in a different way, the student doesn't always understand it "because their mental age is too young for the skill." She commented that the "skill keeps popping up and popping up because they keep getting it wrong, and the child's frustrated." Teacher Three stated they go over the skills that are on the computer in class in order to give more practice, "but again, if they're not ready, that's not going to work." She gave an example of students progressing in their math concepts to where they were comparing several bar or line graphs at the same time. The students were asked such questions as "Which months show less rainfall? or Which one grew steadily higher?" She believed that

> They don't really understand. You can sit there and show them and tell them the answer, but it's a difficult concept for them. Some of them can get it like the brighter kids, and the low ones, they're clueless. That's frustrating and then they feel dumb.

During the time that the students are not signaling, Teacher Three walks around to monitor the students' work. She says she prints student scores at times so she can see what problems they are having. She expressed concern that her students go to the ILS lab session directly from lunch and recess. Often the students will need to leave the ILS lab setting in order to go to the bathroom. She stated that "if they go, then they don't have time to finish the program. They have to exit out early, and it doesn't give them a score, so they get a zero. It's not an accurate score." Teacher Three stated she does not use assigned seating of students in the ILS lab.

Teacher Four considered her role in the ILS computer lab to be a facilitator. She viewed this role as one that helps students who are having problems such as not hearing on the headphones and giving assistance in rewording questions as a means of further explanations. She stated she tries to relate it to classroom activities. She described a facilitator as "walking around and there to be needed."

During a typical ILS lab session, Teacher Four stated that students work through their "individualized program of reading, math, and language arts." Students work in each area for approximately ten minutes. While they are in the ILS lab, Teacher Four answers questions and helps with equipment problems. Students receive stickers during the lab session if they get 100% on their work. If she observes students having difficulty during the lab session, she and the student listen to the directions again. She then restates the question without giving a hint as to what the answer is. During the time that students

are not signaling for assistance, Teacher Four said she just "walks around to let them know she's around if they need help." She watches for students who are not working and stands behind them to get them back on task. She stated she "mainly facilitates around the room, lets them work on their own, and is there to direct them." Teacher Four stated she doesn't use any particular seating arrangement during the ILS computer session.

Teacher Five views her role in the ILS lab as one who "walks or stands in an area where they can see every child. If the students need help, they are to signal and the teacher will walk over to help that child." She described her role as "getting them back on track, to make sure they understand, and make sure they are hearing well with the headphones."

During a typical ILS session, Teacher Five stated that students do not have an assigned computer. Students sit down, type in their name and number, and get started. If they have any problems, they are to signal with their blue cup on the computer. They are to work on each section of reading, math, and language. After they work through all of these sections, students are allowed to go over and have a seat whenever their time is completed. If she observes a student having difficulty, she has them take off their headphones so they can listen to the question together. Teacher Five has the student explain what he/she heard so she can make sure the directions were clearly understood. If students do not understand the question, she attempts to explain it in a different way. When the students are not signaling, she observes the students. Teacher Five stated she watches to see if the students are on task and taking care of the computer equipment. She stated she did not use a seating arrangement. However, she commented that some

students are not allowed to sit together, and they are aware of this as they go to the computer lab.

Analysis of Data – Areas of Agreement – Van Dusen and Worthen's (1992) studies revealed that to use an ILS to its maximum potential, teachers must be involved with the students as they are working on the ILS. Teacher involvement included teachers acting as a resource to students and actively monitoring students. Their studies revealed patterns that showed that "few teachers actively monitored student progress and only reacted when students signaled that they needed help" (p. 18).

The responses to question two were analyzed for patterns related to active monitoring. All five teachers viewed their roles as one of resource who should be there to give student assistance as well as to help with any equipment problems. Teachers described their roles with the ILS and students as follows: management, active, monitor, facilitator, or observer. Three of the five teachers stated that when students are not signaling for assistance, they are involved in the following: observing, standing or walking where they can be seen if students need help, and monitoring to make sure they are working. These are patterns that are reflective of a resource person. Results from this study revealed that three out of five teachers were not involved in active monitoring. This pattern matches Van Dusen and Worthen's (1992) pattern regarding active monitoring. This finding agrees with Van Dusen and Worthen's (1992) conclusions that few teachers are actively involved with students as they work on the ILS.

Analysis of Data – Areas of Disagreement – Teacher Two actively monitored students while they worked on the ILS. She described her role as helping students to log onto the computers, motivating students, setting goals, helping with computer glitches, giving assistance to students through one-on-one instructions as they encounter new concepts or concepts they don't remember from the classroom, and printing reports each session to check for student accuracy. Teacher Two was observed actively monitoring during observations of the ILS sessions. Teacher One also was observed during the observation phase of this study as actively monitoring her students. The patterns regarding active monitoring for these two teachers did not match the patterns of active monitoring found by Van Dusen and Worthen (1992).

Interview Question Three

The third question was asked to determine the level of teacher involvement with ILS through the use of reports. The file management system can be used to print student scores for each session (Today's Session Report), overall strengths, weaknesses, and progress level of students (Course Report), and Custom Reports that can print reports in reading and math such as grouping reports, grouping by strands or progress level, learning groups, total gains, and parent letters.

Question three was as follows: How do you use the student reports generated by the ILS management system? (a) Which reports, if any, do you use? (b) How often do you access student reports? (c) Are the reports easy for you to use? (d) Do you ever have to adjust the level of the program for the student? (e) Do you conduct conferences with students and/or parents regarding the students' performance on the ILS?

Presentation of Data – Question Three – Teacher One stated that she prints a Today's Session Report every session to check on the students' progress. She uses Custom Reports to print a parent letter regarding the students' progress every nine weeks to accompany their report card. She runs another report about every two weeks "that shows how many problems the child was in, so many sessions, and how many minutes they stayed on the session." She stated this report shows the strengths and weaknesses of a child. She uses this report to determine if "they need a little bit more practice, or some enrichment." Teacher One believes the reports are "very accessible, and they are easy to use." She stated there are other reports available, but they are not the ones that she uses. At times, Teacher One has to adjust the level of the program for the student. For example, if a student is struggling in the initial reading level, she will "put them back in reading readiness for awhile." She commented that she had a first grader who was working at a fifth grade level in math on the ILS. The student began really struggling with the problems, so she changed her placement to problem solving in third grade in order to provide her with math in a different area. Teacher One stated that she uses the Parent Letter Report to discuss student progress with the parents at parent-teacher conference time.

Teacher Two stated she uses the Today's Session Report "to see how many questions they answered that day and to check for student accuracy." She says she uses the Parent Letter Report at report card time. Occasionally, when she knows a student is having difficulty with accuracy, she will "run a report to see which strands specifically they are having difficulty in, and then try and address it in small groups in the classroom." She uses the Today's Session Report with each lab session, the Parent Letter Report once

every nine weeks, and the other report (regarding strands) periodically. "It may be once every couple of months." She believes the reports are easy to use, but at times it is difficult to locate information on the exact strand. She stated that "You have to go into several different areas and cross reference, and then find out what the strand's symbol means. Then you go in a book and look what that strand covers." She commented "there should be a way where you can just print it out, and it would tell you specifically which skill they are having difficulty in without having to cross reference to a book."

In regard to adjusting a student's level, Teacher Two stated at the beginning of the year every student is placed at first grade, first month, and "then if they are having difficulty the program can take them back or take them forward if they are doing all right." Occasionally, she will place a student at a lower level if they are having difficulty in order to give them more success. She stated she did that more during the first year the school had the ILS than what she does now. For new student placement on the ILS, she just observes them and makes an estimate as to where she should place them.

Teacher Two goes over the Parent Letter Report with parents at conference time twice a year. Other than conference time, she just answers parent questions as they arise. She stated they "probably spend two to three minutes discussing it in conferences twice a year." In regard to conferencing with students about their work on the ILS, Teacher Two stated that she encourages them by giving them a sticker after they return to class if they did really well on the ILS. "For those kids who are having difficulty or I see they are clicking time out or whatever, I will pull them aside and talk with them individually about that."

Teacher Three stated she sends home the Parent Letter Report once a month. However, she believes her assessments in the classroom give a "better picture of them of what we are doing in the classroom." She has an aide work with the students on skills related to the classroom and does not use the other scores on the Parent Letter Report. She stated she tells parents that the score on the letter is "one piece of the child's day - one time - maybe it's accurate, maybe it's not." When Teacher Three was asked if she uses any other reports, she says there is one report that breaks down the skills to show what weaknesses the students are having. She or the aide will then work with "small groups of students who are having the same kind of problems and reinforce those out of the lab." She believed the reports are easy to use.

Teacher Three was asked about adjusting a student's level on the program. She stated they have to put them on a first grade level at the beginning of the year.

> We are required to do that whether they were up to first grade level or not from kindergarten. So they start at first grade, and its left like that for the rest of the year. So, that's a requirement. We have no choice.

Teacher Three stated they were "told in their (ILS) workshop not to do that, but we're doing it. It's not used properly."

Teacher Three was asked if she conducts conferences with students and parents regarding ILS performance. She stated she sends home the Parent Letter Report, and if she gets a note from the parent she will call them back.

Teacher Four responded to the question by stating that she uses "the reports to check and see what grade level the child is on for the different subject areas." She says that reports can be used with the report cards to review with parents. Teacher Four indicated that the reports reflect student strengths and weaknesses so teachers can provide

more help. She stated that if a student has a weakness, she could put them on that subject a little longer to give more practice. She commented that some students are slower thinkers. Therefore, they have not completed as many problems and may need a little extra time to get though the exercises by doing additional sessions. Teacher Four says she can have the aide work with the student by using games or just reading. She commented she could look at the reports and make some games to put in the learning centers.

Teacher Four stated she uses the Parent Letter Report and a report at the end of the year. These reports show the students' grade level as well as where they began initially and where they finished at the end of the year. She commented "those are the scores that we send with them in the next school year for the next grade level. It gives a pretty accurate account." She stated the reports were easy to use.

When Teacher Four was asked about adjusting a student's program level, she stated she has only adjusted the level for a couple of students. For example, one student was not able to begin the first grade year in the initial reading level, so he was placed in reading readiness. She commented that she started some very good readers at a third grade level. She explained this process as a "kind of touch and feel sort of thing. Okay, let's see if they can do this, and I'll put them in at a certain level that might be above first grade. If they seem to do okay with it and are very comfortable, then I'll let them go through it."

Teacher Four was asked if she conducts conferences with students and/or parents regarding student performance on the ILS. Teacher Four stated she conducts conferences with parents twice each year.

Teacher Five stated every nine weeks she prints the "parent letter that goes home to the parents to see where their child is and what level they are on in reading and math." She tries to run the Parent Letter Report at four or five week intervals just for herself in order to see where the students are working. She stated she does not use any of the other reports. She believed the Parent Letter Report was easy to use.

In regard to adjusting the level of the ILS program for students, Teacher Five says she begins everyone on the same level at the beginning of the year. After she gets to know the students and what kind of levels they are on, she will adjust their levels to where they need to be working. As the students make gains, she relies on the ILS program to move them on to the next level.

When asked if she conducts conferences with students and parents regarding student performance on the ILS, Teacher Five stated she has a meeting with parents two times each year. These are the two regularly scheduled teacher/parent conference times.

Analysis of Data – Areas of Agreement – Teacher involvement with the ILS system is important if maximum benefits from the program are to be achieved. According to Van Dusen and Worthen (1992), teacher involvement includes the use of reports generated by the ILS management system. Their studies revealed a common pattern found in the ILS lab is the lack of teacher use of system-generated reports. Their results revealed that "less than half of the teachers use these reports on a regular basis. This low level of report usage means that a potentially important aid in keeping track of student performance, and individual needs is being wasted" (p. 18).

Teacher responses to question three were analyzed for patterns related to report use, program adjustment, and student/parent conferences. With the exception of the use of the Parent Letter Report which is discussed under areas of disagreement, Teacher One used the Today's Session Report for each lab session and "runs a report once about every two weeks that shows how many problems the child was in, number of sessions, and strengths and weaknesses of a child." Teacher Two used the Today's Session Report for each lab session and occasionally the "strand" report if she observed a child having difficulty. Teacher Three used a report that showed student weakness but could not remember the name of the report. Teacher Four used one report at the end of the year, and Teacher Five did not use any other reports.

Three of the five teachers did not use reports on a regular basis throughout the year. These results suggest a pattern of limited use of reports. This finding agrees with Van Dusen and Worthen's (1992) findings that "less than half of the teachers use these reports on a regular basis" (p. 18). It should also be noted the ILS generates several types of reports. Some of the other reports offer more information regarding student progress than the Today's Session Report that records the number of problems worked and number worked correctly. This finding suggests that possible weaknesses in a student's learning process are not being readily identified through the use of the ILS.

The number of times that teachers adjust the level of the program for students is relatively low. Reasons for this could be due to teachers feeling that they cannot change the level, that the computer will make the adjustment totally, or that there is little need to adjust levels.

When teachers were asked if they conduct conferences with students and parents regarding student progress, most teachers responded this was done through the Parent Letter Report every nine weeks and during parent-teacher conferences two times each year. Four of the teachers did not acknowledge conducting any conferences with students regarding their work on the ILS. These results suggest that a low-level use of ILS reports contributes to few program adjustments and limited student/parent conferences with the teacher.

Analysis of Data – Areas of Disagreement – The Parent Letter Report was used by all teachers in the study on a regular basis. This report is required to accompany student report cards every nine weeks by the building principal. This may account for the frequency of use by all of the teachers in the study. However, Parent Letter Reports give the students' current level of progress, initial placement, and achievement gains. This report does not reflect any strengths or areas of difficulty of the students. Other reports on the ILS appear to offer more information regarding student performance.

It should also be noted that statements were made regarding a student's initial placement at the beginning of the school year. Some of the teachers stated that students are placed on a first grade level initially. Teacher Three believed that the students' level of program was not to be adjusted after initial placement. However, other teachers acknowledged adjustments to program levels. There appears to be some misconceptions related to teachers being allowed to change or adjust program levels for students.

Interview Question Four

Questions four and five were related to integration of the ILS with classroom curriculum. Question four asked the following: In your opinion, how do you view the ILS program as it relates to the regular classroom curriculum? (a) Do you view the ILS program as part of the regular curriculum or as supplemental? (b) Do you think students should receive a grade for their performance on the ILS?

Presentation of Data – Question Four – Teacher One stated the ILS "relates very well to what we're teaching and the skills we are introducing in first grade." She commented that many times her students will signal with their cup and say "This is what we did yesterday," or "This is what we're studying about." Teacher One believed it was "really nice for them to see it taught in a different way, in a different manner." Teacher One considered the ILS to be "a good form of supplement."

Teacher One was asked if she thought students should receive grades for their ILS performance. She did not think students should receive a grade for working on the ILS since "a report card shows up after each subject area and lets them know for each day's session how well they did."

Teacher Two viewed the ILS as part of the regular curriculum. She considered it as a reinforcement of classroom curriculum and computer literacy. She believes "computer literacy should be a major component of any educational system in our society today." Teacher Two did not believe students should receive a grade in their ILS work. She stated she does not know everything they are being told on the computer and cannot "know when they are having every difficulty unless they signal" to her for help. She

believed the students would be at a disadvantage if they did not understand something or were the type of student who did not ask questions. Therefore, she believed that it would not be fair to give students a grade.

Teacher Three stated the ILS contained some of the state requirements for reading and math skills, but "it doesn't have someone explaining on the computer exactly what they are suppose to do." She described the ILS as talking to the student in a monotone voice with no emotion. Teacher Three considers the ILS to be part of the regular curriculum because "we are required to go whether we want to or not. You don't have a choice about it." In her opinion, students should not receive a grade on the ILS because "it's not an accurate score."

Teacher Four stated that the ILS "runs very closely to our curriculum in the classroom. It's an excellent review. The correlation is pretty close." She considered the ILS to be supplemental. Teacher Four believed that students should not receive a grade for their ILS work.

Teacher Five stated that the ILS correlates with the classroom curriculum for the most part and allows students to "excel even into second and third grade level work." She considered the ILS to be supplemental. Teacher Five did not think the students should be given a grade for their work on the ILS because "it's just like another tool for teaching. She believed some of the students' performance on the computer may not be what it is in the classroom." Some students may do well in the classroom and in reading groups, but score low on the computer.

Analysis of Data – Areas of Agreement – Van Dusen and Worthen (1992) referred to integration as "the consolidation and synthesis of information from the ILS and the classroom" (p. 19). They viewed the ILS as an extension of the basic curriculum and not a supplement to classroom learning. Their studies revealed the following patterns regarding integration of the ILS and classroom curriculum.

Van Dusen and Worthen (1992) found that integration appeared to be influenced by the belief of most teachers that the ILS should be mainly used as a supplement. Their studies found only a few schools used student performance on the ILS in grading student work or reporting student progress to parents.

In this study, four of the teachers viewed the ILS as a great reinforcement, an excellent review, and related to classroom curriculum. The results of this study revealed the following patterns. Three of the five teachers considered to ILS to be supplemental. All of the teachers believed that students should not receive grades regarding ILS work. Reports to parents concerning student performance were limited. These patterns followed those patterns found by Van Dusen and Worthen (1992).

Teachers reported in earlier statements that parents were basically informed each nine weeks with the Parent Letter Report in the student's report card. Teachers also used this parent letter during parent-teacher conferences two times each year. However, one should keep in mind that the Parent Letter Report only states students' levels of performance and not their strengths and weaknesses. This finding agrees with Van Dusen and Worthen's (1992) studies that few schools use student performance on the ILS in grading student work and reporting progress to parents.

It was the opinion of Van Dusen and Worthen (1992) that "when teachers and students are not held accountable for what students are learning on the ILS, it tends to de-emphasize the value of the ILS experience" (p. 19). Evidence of a possible lack of accountability was revealed in this study through limited reports to parents and low usage of reports by teachers. Teacher responses during interview question three also suggested a lack of teacher-student conferences. Four out of five teachers did not report conducting conferences with students regarding their ILS performance. See Appendix H for summary of teachers' views regarding the integration of the ILS with classroom curriculum.

Analysis of Data – Areas of Disagreement – Two of the teachers' views did not agree with the pattern found in Van Dusen and Worthen's (1992) studies. One teacher viewed the ILS as a great reinforcement and part of the classroom curriculum. She considered the use of an ILS to be part of computer literacy that should be part of any educational system. Another teacher considered the ILS as part of the curriculum because they were required to go and did not have a choice.

It should also be noted that in the previous question, Teacher Four stated that the students' ILS performance scores were sent to the next grade level for the upcoming school term.

Interview Question Five

The fifth question was designed to investigate the integration of the ILS with classroom curriculum. Question five was as follows: How do you use the management

system of the ILS to change and resequence lessons within the program to match the objectives of your classroom curriculum? (a) What do you do if you observe on student reports that a student is low in a particular area?

Presentation of Data – Question Five – Teacher One stated the only modification she makes in regards to a change in lessons within the ILS program to match classroom objectives is to modify her classroom lessons. She gives an introduction or short discussion to several students who may be having difficulty with a skill on the ILS that has not been introduced yet in the classroom. When she observes on a report that a student has a low area, she will work with that student in the classroom using manipulatives, give additional seat work papers, and adjust learning centers. She commented she can also go to the ILS and print the reports "that tell you exactly what their deficiencies are. You can pull those up, and it gives you worksheets so you can pull those up too." Students with low performance areas on the reports receive instruction in the classroom through small or whole group lessons in reading or math.

Teacher Two stated that she does not use the management system to change and resequence lessons on the ILS. If students are having difficulty in a particular area as observed on the reports, Teacher Two stated she attempts to group two or three students with the same difficulty for additional instruction. She provides additional help through small group presentations or reinforcement through whole-group class instruction.

Teacher Three stated she does not use the management system to change and resequence lessons. She commented "No, we cannot do that." She stated the computer keeps them leveled and is responsible for that. If she observes a low area on a report, she

will try and go over it in class. She will work either in small groups or individually "depending on whether other students are having the same problem." Teacher Three believes the ILS is not clear in giving directions. She stated that working with students in small groups or individually does not mean they are going to understand it that way either, but it does help some students.

Teacher Four commented that she does not use the ILS management system to change or resequence lessons. She noted, however, that sometimes she sees a particular skill presented in such a way that it gives her an idea for a lesson or activity that she can use in the classroom. If she notices that students are having difficulty in a particular area, Teacher Four stated that she attempts to address it in learning centers or on the board in the classroom.

Teacher Five responded that she does not use the ILS management system to change or resequence lessons. If she notes a low area of student performance, she commented she would "probably take a look at the child and see how they are doing in the classroom." She believed "if there is a problem on the computer, there is probably a problem in the classroom with performance." Therefore, she would contact the parents to discuss any weaknesses. See Appendix H for summary of teachers' views regarding ILS integration with classroom curriculum.

Analysis of Data – Areas of Agreement – One of the research questions used to guide the study was: What strategies do teachers employ to integrate the use of the ILS with classroom curriculum? In this study, integration of the ILS with classroom curriculum was investigated as follows: (1) teachers relating classroom experiences to students as

they worked on the ILS, and (2) teachers resequencing ILS lessons to correspond with classroom curriculum. Observations of ILS sessions suggested that teachers relating classroom experiences to students as they worked on the ILS was minimal. Responses to question five were analyzed for patterns related to resequencing ILS lessons. Data revealed that none of the teachers used the resequencing feature of the ILS.

Van Dusen and Worthen's (1992) studies investigated the use of resequencing lessons and found the following pattern: "less the 25% of the teachers made use of these tailoring features on a frequent basis, and another 25% never did" (p. 19). Patterns of ILS use regarding the resequencing of lessons match the patterns found in Van Dusen and Worthen's (1992) studies. This finding along with the observations conducted during ILS sessions suggest that integration of ILS use with a classroom curriculum is minimal.

Since none of the teachers resequenced ILS lessons, it is possible that they are not aware of this feature or schedules do not allow teachers time to make ILS adjustments. Low level of teacher computer skills could also have been a factor. The self-evaluation survey of basic computer use revealed that three of the teachers in this study considered their basic computer operation skills to be below mastery level, and two teachers rated their file management skills below mastery.

One area of integration of ILS use with a classroom curriculum was identified in the teachers' responses as to what they do if they observe low student performance on the ILS reports. Three teachers responded with references to working with students in small or whole group instruction in the classroom. Individual instruction to students and use of learning centers was also acknowledged. This finding suggests that some integration does exists between use of the ILS and the classroom; however, the existence is minimal.

Analysis of Data – Areas of Disagreement – Teacher One commented that when she observes low student performance on the reports, she uses the ILS to identify the specific deficiency. She then uses the ILS management system to locate corresponding worksheets.

Interview Question Six

The sixth question asked the teachers to describe the training they received regarding the use of the ILS computer program. Question six was as follows: How would you describe the training you received regarding the use of the ILS program? (a) Describe the features of the ILS management system that you are comfortable using? (b) How did the staff training prepare you to effectively use the reports generated from the management system? (c) How did the staff training prepare you to effectively use the ILS with your classroom curriculum? (d) Describe any area of the ILS program that you feel additional training would be beneficial.

Presentation of Data – Question Six – Teacher One believed they were not trained properly. She believed that more training was needed. She described the training as a hurry up and get into the program approach. They were allowed to take notes. She stated the training had taken place approximately three years ago, and she believed the training was conducted in half-day sessions. The training involved lectures from the trainer and practice on the computer doing "step by step things that we needed to do to run reports." Teacher One stated the training did not provide enough time to explain each part of the report. She believed that a difficult part of the training was due to not having seen a

student go through the program. Teacher One stated this situation made it hard to know what information was important, and how it related to the program.

In order to effectively use the reports after training, Teacher One continued to make phone calls to the ILS company and trainer as well as ask fellow teachers for assistance. She believed that training in this area was not adequate and refresher courses should have been provided. She believed it would have been helpful to have a day's session to just review especially since new teachers were coming in each year. After many phone calls to the ILS company and trainer, Teacher One feels fairly proficient in the program. She can print the Today's Session Report, Parent Letter Report, and the report (Course Report) that shows the student's overall performance: percentages, gains, and missed questions. She was comfortable enrolling students and adjusting a student's program.

When asked to describe any area of the ILS where additional training would be beneficial, Teacher One stated that refresher courses are needed every year. She believed the program is updated yearly, and refresher courses would allow teachers to remain informed.

Teacher Two thought the training was good but "wished it had been taught in a smaller group setting." The ratio was about 20 teachers to one trainer. The trainer "couldn't possibly get to all of us and address our concerns." She believed, however, since she was part of the core group that her training was adequate. She stated that other teachers as well as herself had to do a lot on their own time. "It placed a lot of responsibility on the core group teachers to make sure that they knew how to approach it (the ILS) and use their time after school to become familiar with the system." She stated

she spent a lot of time on her own trying to absorb it all and see if she remembered what she had learned.

Teacher Two was comfortable enrolling students in the ILS, enrolling students in the different courses, modifying courses to meet the needs of students, and setting time frames. She was comfortable running the Parent Letter Report, Course Report, Gains Report, and Customs Report. Teacher Two believed the training really helped in understanding the Course Report. She thought the trainer explained this report well. She thought as far as the other reports were concerned, she had to explore those on her own.

When asked how the staff training helped to effectively use the ILS with a classroom curriculum, Teacher Two believed the training did not address this at all. She did not remember that issue being brought up at all in the training other than helping students with difficulty through the use of small group instruction or going over it in class. She did not remember any connections being made regarding the use of the ILS to match a classroom curriculum.

Teacher Two stated that "additional training in the reports would be helpful." She also commented that she would like to see the program updated and modified in order to address computer glitches and allow more freedom in the program. She expressed a desire for the reports to be more user friendly so that mentor teachers could assist new teachers quickly.

Teacher Three described the training she received as "okay." She thought the trainer was good. However, she described the training as being two or three all-day sessions. She believed that "it's too much information at one time in one day." She

stated if "sessions would have been spread out throughout the year, it may have been easier." She thought that training sessions needed to be ongoing.

In describing the features she can comfortably use, Teacher Three stated she can print the report that tells what the students are doing and where they are having problems (Course Report). She can also print the Parent Letter Report and the summary of key information report. She stated by looking at the report, one can see if the student is not working quickly. She believed "that's why their score's low and not because they don't know it." She was concerned that the computer gives a certain time to work the problem and after that a little alarm clock goes off, and it's marked wrong. She stated, "That didn't mean they didn't know it." When asked if the computer can be set for kids to have longer time, she replied

> Yes, but the longer they take on a question, they won't get through early enough to finish each section. It'll take them twice as long for them to get through a program or session before they can move up which I guess they actually shouldn't move up if they don't know it.

When asked how the staff training helped to effectively use the reports, Teacher Three believed the trainer gave them the information, but she did not remember half of what the trainer said. She stated she attempted to use the manuals (provided in the media center). However, some of the things she wanted to do, she didn't have time to do it. It was difficult. Teacher Three stated that

> You take so much home, and you work during the day, and you don't have time. It's like you're working with the kids. You don't have time to go through all that. I don't place a great importance on that grade, so I guess I feel guilty a little bit but not too much.

When asked how the staff trainer helped her to effectively use the ILS with the classroom curriculum, Teacher Three stated she did not remember it if she did. When

asked in what areas of the ILS computer program would additional training be beneficial, Teacher Three stated she

> could go through the whole thing again, and I could sit and listen. It's like I've got some knowledge already, and it's like if I hear it again I'll pick up more information now because I've had time to practice what she taught. I've got the basic skills, and I can go from there and learn some of the higher level things that it can do.

When asked if she thought the school should consider adding more staff development training with this program, she stated "In theory, yes. I mean, if they want to do it right, yes. But I don't like the program so I don't care if they do or not."

Teacher Four described the training as a couple of workshops using a question and answer format "where we could sit down and go through the management system just to kind of get an idea in how things go and work if we had any questions." When asked if the training made her feel comfortable in using the program, she commented she was fairly comfortable. However, she stated "that maybe after a while I could have really used another training session. So maybe there's not really enough because there are some other questions that come up that I'm not sure about." She thought additional training on reading the reports would be helpful.

When asked what features of the ILS she was comfortable using, she stated she was really comfortable using the Parent Letter Report and reading it to parents. She also commented that she believed the training prepared her to effectively use the reports generated by the ILS.

In considering how effective the training was regarding the use of the ILS with the classroom curriculum, Teacher Four stated the training did not really address it. "There wasn't training available with that. I think it's just up to the individual teacher to see

what they can do." She did believe that training related to this area would be beneficial. When asked if there is anything in the overall use of the program in which teachers could benefit from further training, Teacher Four stated "No."

Teacher Five stated she could have used more training regarding the ILS. She commented "I'm not really computer literate, and I felt like I could have used some more training because at the time I was just learning how to use a mouse." She went on to say that "sometimes it takes me two or three times before something soaks in; so I felt like training could have been a little longer, a little more lengthy, or a little more knowledgeable." She stated she would have liked some follow-up sessions to answer a few more questions. When asked what features of the ILS management system she was comfortable using, Teacher Five replied she "can now comfortably do the Parent Letter, but that's taken three years."

When asked how the training helped in learning how to effectively use the reports, Teacher Five stated "they may have gone over it, but the way I learned it was through some of the other teachers from the core group." They set down with her several times until she was able to do it.

When asked if training helped in learning how to effectively use the ILS with classroom curriculum, Teacher Five thought they talked about it a little. She stated the trainer talked about some different programs they could use to go along with their units or lessons, but she had not done that. Teacher Five was asked to describe any area of the ILS program in which she thought additional training would be beneficial. She replied by saying

> the whole program. I would like to have a touch up on the whole program, everything on it. A lot of times, not so much now but when students were having complications, it's frustrating for the teacher when you have two or three that are having complications, and you're trying to help one and can't figure out what the problem is. So I would just like to have a whole training session over the whole area again.

Analysis of Data – Areas of Agreement – One of the research questions guiding the study was: How do teachers view the training they received concerning the effective use of an ILS? It should be noted that specific data regarding the amount of training that each teacher in this study received was not available since the initial training took place approximately three years prior to this study. However, three of the teachers were part of the core group and received extra training in how to enroll students in the ILS and run reports generated by the ILS. The other two teachers were not part of the core group and received less training.

Van Dusen and Worthen's (1992) studies revealed these patterns: (1) teachers and administrators believed that staff training should include basic instruction about the system, (2) ways to integrate the ILS into the classroom curriculum, and (3) teacher use of reports. In this study, teacher responses to question six were analyzed for patterns related to staff training.

The results of this study revealed that four out of the five teachers reported a need for further training. Comments from teachers about the training included: too much information was given at one time, training was hurried and rushed, and training should have occurred throughout the year. Two teachers stated they had to spend a lot of time on their own to learn the program. These findings suggest that initial training was not

sufficient. Schools must consider additional training throughout the period of implementation so that teacher needs may be addressed.

Four of the teachers agreed that training did not address how to integrate the ILS with the classroom curriculum. This was a significant finding. Insufficient training related to integration will hinder maximum use of the ILS.

Four teachers described the training in use of reports as follows: (1) training did not provide enough time to explain reports, and too much information was given at one time. This finding is significant and suggests that attention needs to be given to the way that training is conducted. Results from the self-evaluation survey by teachers revealed that teachers exhibited different levels of basic computer use and file management. These results suggest that ILS training may be influenced when teachers have limited computer skills. For example, Teacher Five considered herself to be computer illiterate and stated she was just learning how to use the computer mouse when she received ILS training. She also commented about being frustrated in the ILS lab when students were having complications and not being able to help them.

Teachers were asked in what areas of the ILS was further training needed. One teacher suggested further training in use of reports. Two teachers stated they had a need for further training in the whole program. One teacher stated she would like to see the teachers discuss the reports they use as well as the way they use the reports. This finding suggests that training in ILS use was insufficient for most of these teachers.

Van Dusen and Worthen (1992) concluded from their studies that successful implementation of any program requires sufficient training in order to obtain the desired results. The responses from question six suggested that the teachers did not believe they

received sufficient training as evidenced by the various teacher responses regarding training in the ILS, use of reports, and lack of information in how to effectively integrate the ILS with classroom curriculum.

Van Dusen and Worthen (1992) also made two assumptions from their studies regarding staff training:

> (1) the teachers who will be most effective in implementing the ILS are those with the greatest familiarity and comfort level with the computer; and (2) increasing computer literacy and decreasing computer anxiety for teachers with those specific needs should raise the overall quality of implementation in that school. (p. 20)

The results of the Self-Evaluation For Basic Teacher Computer Use Survey revealed that three of the five teachers rated themselves below mastery level in basic computer operation. Two teachers rated themselves below mastery level in file management. This finding is significant and suggests that schools should consider the current level of computer use by teachers when conducting staff training and address accordingly. The level of a teacher's computer skills may affect the outcome of staff training.

Analysis of Data – Areas of Disagreement – Teacher Two described the training as good and believed that being on the core group provided her adequate training. On the self-evaluation of computer use, this teacher also rated herself at mastery level in computer use in eight out of ten areas. However, she commented that she spent a lot of time on her own after the training trying to absorb it all and seeing if she remembered what she had learned. As for training in use of reports, this teacher believed the Course Report was explained very well, and she explored the other reports independently.

Teacher Five commented that she believed the trainer had discussed integration. She stated the trainer presented some different programs they could use to go along with some of their units and lessons. However, she had not used them.

When asked about describing any area in which further training was needed, Teacher Four stated there were not any areas needing further training. However, this same teacher responded earlier in the interview that she could use another training session especially in reports.

Interview Question Seven

The seventh question was asked to investigate the teachers' views regarding the benefits of on-going meetings. Question seven was as follows: Does your school conduct regular meetings to address concerns and needs of the teachers regarding the use of the ILS program? (a) In what ways do you believe that teachers could benefit from meetings held regularly to address concerns regarding the use of the ILS?

Presentation of Data – Question Seven – Teacher One responded that the school does not conduct regular meetings to address teacher concerns related to the ILS. She believes regular meetings would allow teachers to share ideas. Teachers could "share ways to access different reports and ways that the computer could be fully utilized." She believes "each teacher probably knows more about one area than they do in another on the computer, and if we could all pull that together, it would make a more conducive program for our children."

Teacher Two stated regular meetings do not occur. She believes regular meetings would allow teachers to learn about the various ways that teachers are using the ILS. Teachers could address computer problems. She also stated that regular meetings would allow teachers to share what they know about the ILS such as the use of reports. She believes this would help with communication. She also stated she would like to see some other programs added to the computer in order to give the students some variety.

Teacher Three stated she did not believe they had regular meetings. She commented that the principal asked recently if there were any ways to make the ILS more effective or improve it. She said that was "the first question we have had all year long" regarding the use of the ILS. Teacher Three stated she believed biweekly meetings would be beneficial. She suggested that teachers could sit down at the computer and work through the ILS. She thought this would be a better way to learn about the ILS than just talking about it. Teacher Three believed that teachers hearing other teachers talking about the ILS as they were on the ILS would also help.

Teacher Four stated they held regular meetings in the beginning but not recently. She remembered meetings occurring five to seven times basically during the first year. Teacher Four did not believe that regular or monthly meetings would be necessary. She suggested that meeting "one time in the fall and one time in the spring would be good."

Teacher Five stated the school does not hold regular meetings. She believed regular meetings would be "a big help because that way we could talk about what needed to be done or who needed help." She suggested that if they all met, teachers could help each other out or contact someone from the computer company to come and have another workshop.

Analysis of Data – Areas of Agreement – This question was asked in order to gain the teachers' views regarding the use of regular meetings. Van Dusen and Worthen (1992) did not really address this issue. However, Cook (1994) suggested that a staff development plan "must not only include formal training by outside consultants, but also opportunities for teachers to work together, coaching each other on relevant problems, and creating a supportive collegial work environment" (p. 67).

Four out of five teachers agreed that regular meetings would allow teachers to share information with each other, aid communication, allow for hands-on practice in using the ILS, and assistance for those teachers needing additional help. This finding suggests a willingness by most of the teachers in this study to work together to improve their use of the ILS. Most of the teachers agreed that regular teacher meetings would be beneficial.

Analysis of Data – Areas of Disagreement – Teacher Four did not believe that regular or monthly meetings would be necessary. She suggested that "one time in the fall and one time in the spring would be good."

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Chapter V will present the major points of this study, report the findings and conclusions, discuss recommendations for further study, and provide final comments.

Summary

This study investigated the current use of an Integrated Learning System (ILS) within an elementary school two years after implementation. An interpretative case study outlined by Merriam (1998) was designed to compare the use of an ILS by teachers with the previous research findings of Van Dusen and Worthen (1992) in order to determine if the ILS was being used to its maximum potential. Observations, interviews, and a self-evaluation survey of basic teacher computer use were used to examine the use of an ILS by teachers in three areas: (1) teacher involvement with the ILS, (2) integration of the ILS with classroom curriculum, and (3) staff training in use of the ILS.

A study of this kind is important, especially in the area of technology, in order to determine if ILSs are being used more effectively today within a school setting compared to its use ten years ago. Schools that implement an ILS should "undertake and report on their own studies of its effectiveness, thereby increasing the body of research in the use of integrated learning systems in a school environment" (Alifrangis, 1990, p. 23). In

addition to adding to the body of research, the results of this study can be shared with other schools who are contemplating the purchase of an ILS in order that effective implementation and use of an ILS might be achieved.

Finally, this study is significant to schools who are currently using an ILS. The results of this study can be used to evaluate the strengths and weaknesses related to the current use of their program. Further needs of teachers regarding maximum use of an ILS can be identified and addressed. An investigation into the use of any program should lead to its improvement and effective use that will ultimately benefit students in their endeavor to become successful learners.

Chapter I presented previous findings of ILS use which contributed to the need for further research. It presented (1) an introduction of literature that revealed mixed findings regarding the use of an ILS, (2) the research findings of Van Dusen and Worthen (1992) that facilitate or impede implementation of an ILS, (3) the need to conduct research regarding the current use of an ILS based on these previous research findings, and (4) how research is needed in order that ILSs can be used to their maximum potential. Chapter I also included a brief summary of each chapter in this study.

Chapter II discussed a review of the literature and research regarding the use of an integrated learning system. The literature was presented in three sections: (1) ILSs: Its Advantages and Disadvantages, (2) ILS and Its Effectiveness, and (3) Van Dusen and Worthen's (1992) Guidelines For Effective ILS Use.

Chapter III presented an explanation and description of the research study. It included the (1) rationale for the design and methodology of the study, (2) theoretical framework, (3) qualifications of the researcher, (4) participant criteria and selection,

(5) setting, (6) organization of the study, (7) data collection process, (8) data analysis procedure, and (9) validity and reliability of the study.

Chapter IV included the presentation of the data collected through a self-evaluation survey, observations, and interviews with participants. Chapter IV also presented the analysis of the data through the use of pattern-matching logic (Yin, 1994). Patterns within the data from this study were compared to the patterns found in Van Dusen and Worthen's (1992) findings. Areas of agreement and areas of disagreement within the patterns were established and discussed.

Findings and Conclusions

Van Dusen and Worthen (1992) concluded from their research findings that in order for the use of an ILS to reach its maximum potential, the following three components must be implemented: (1) teacher involvement with the ILS, (2) integration of the ILS with the classroom, and (3) staff training in the use of an ILS. Based on these three components, the findings of this study suggested that the ILS is not being used to its maximum potential. The following research questions guided this study:

1. How do teachers view their roles as facilitators of an ILS program?
2. What strategies do teachers employ to integrate the use of the ILS with classroom curriculum?
3. How do teachers view the training they received concerning the effective use of an ILS?

Teacher Views as ILS Facilitators

In order to investigate how teachers viewed their role as facilitators of an ILS, teachers were observed while they conducted ILS sessions. Observations of the teachers during ILS sessions revealed that all teachers responded very well to the students as a resource person; however, only two out of the five teachers were involved in active monitoring of students. ILSs were never intended to be used in isolation. Active monitoring provides teachers with opportunities to interact with students and relate ILS experiences to classroom activities that will enhance integration of a curriculum. Active monitoring provides teachers with first-hand knowledge regarding the way that students are interacting with the ILS.

It is possible that unless teachers have actually viewed an ILS facilitator actively monitoring students, they may not be aware of what their role as an ILS facilitator actually involves. Staff training must specifically address the need for teachers to actively monitor their students. Training should also include teachers viewing schools where ILSs have been successfully implemented.

Interviews were also conducted with participants as a means in which to investigate how teachers viewed their roles as facilitators of an ILS. A significant finding from this study suggested that the views of the teachers regarding their roles as facilitators of an ILS influenced the level of teacher involvement with the ILS. Interview questions revealed that one teacher viewed her role as active, and one teacher viewed her role as one of management. These teachers were observed working with students in between student signals during ILS sessions and printing reports at the end of each ILS session.

Three teachers viewed their role as either a monitor, observer, or facilitator. These three teachers described their role as helping students only when needed and did not print reports at the end of the ILS session.

Teachers who considered their role to be active and one of management were more involved with the ILS than teachers who viewed their role as facilitator, monitor, or observer. These teachers received similar ILS training, yet each teacher described her role differently. Future staff training should incorporate specific guidelines that address the roles of teachers as they actively work with students during ILS sessions.

According to Van Dusen and Worthen's (1992) guidelines, the role of the facilatator of an ILS also includes teacher involvement with the ILS. Another significant finding from the study suggested that teachers who exhibit a greater level of mastery in basic computer skills appear to have greater involvement with the ILS. Results from the self-evaluation survey revealed that Teacher One rated herself at mastery level in seven out of ten areas. Teacher Two rated herself at mastery level in eight out of ten areas. These teachers were observed actively monitoring their students during ILS lab sessions and printing reports at the end of ILS sessions.

Teacher Three and Teacher Five rated themselves below mastery in eight to nine areas respectively. Although Teacher Four rated herself above mastery in five out of ten areas, her below mastery level in computer operations may have contributed to a lower level of involvement with the ILS. These teachers did not actively monitor their students during ILS sessions and did not print reports at the end of each session.

The significance of this finding is that computer skills of teachers vary. Schools must address this issue when implementing computer programs. Schools should consider

staffing a full time technologist who could aid teachers in ILS use during the training period. Additional on-going training sessions could also be offered to teachers as a means of helping them to become more familiar with basic computer operations. As teachers become more proficient in basic computer use, they could assume more responsibility for teacher involvement with the ILS.

Teacher involvement with the ILS includes teachers using ILS reports on a regular basis. This study revealed that reports from the ILS were used on a very limited basis. This finding suggested that valuable information regarding a student's strengths and weaknesses is being wasted. This low level of report usage could be the result of inadequate training. Teacher responses to interview questions regarding staff training in use of ILS reports revealed that teachers believed the training did not take enough time to explain reports. Schools must include specific training designed to assist teachers in effectively using ILS reports. On-going training must be provided until teachers become proficient in accessing needed ILS reports. Teachers could also work together after school to engage in hands-on experiences regarding the accessing of all ILS reports.

Strategies Regarding ILS Integration

The second research question guiding the study was used to investigate the strategies that teachers use to integrate the ILS with classroom curriculum. In this study, integration of the ILS with classroom curriculum was investigated as follows: (1) teachers relating classroom experiences to students as they worked on the ILS, and (2) teachers resequencing ILS lessons to correspond with classroom curriculum. Results from this study suggested that integration in ILS use with classroom curriculum was very limited.

Data from observations of teachers working with students during ILS sessions revealed only three occasions when a teacher referred to an activity from the classroom as a way of giving further explanation to students needing assistance on the ILS. Findings from this study also revealed that most teachers viewed the ILS as supplemental, believed grades should not be given, and conducted limited teacher-parent conferences and teacher-student conferences. This evidence suggested the possibility of the ILS as being regarded as a separate entity from the classroom curriculum. Therefore, if the ILS is viewed as a separate entity, integration of curriculum is hindered. If the ILS is viewed as a separate entity apart from the larger curriculum, then optimal educational benefits for students will not be achieved.

Staff training is needed to address the importance of using the ILS as a part of the school's basic curriculum in order that integration can be achieved. Teachers need to be provided specific guidelines that model strategies for effective integration. Teachers should have regular meetings to brainstorm additional methods and activities that will enhance the use of the ILS with classroom curriculum.

Schools may decide that grades for young students working on an ILS is inappropriate. However, this study revealed a lack of teacher-student conferences regarding ILS performance. Teacher-student communication is vital to a student's overall learning process and communicates to the student that what they are doing is worthwhile. Therefore, the number teacher-student conferences should be increased.

The second research question was also used to guide the investigation of integration strategies used by teachers to meet classroom objectives. Findings from this study revealed that none of the teachers used the ILS management system to change or

resequence lessons within the program to meet classroom objectives. The file management system of this ILS program allows teachers to program short lessons related to particular reading and math skills. These skills can be matched with those being introduced in the classroom. This same ILS feature can also be used to address specific student needs identified through ILS reports. When teachers do not adjust ILS programs to match classroom objectives, integration of curriculum is hindered as well as limited.

The teachers in this study were asked how the staff training regarding ILS use helped them to effectively use the ILS with the classroom curriculum. Most of the teachers stated the training did not prepare them in how to use the ILS with classroom curriculum. Integration of the ILS with classroom curriculum is hindered when teachers do not receive sufficient training in how to effectively use and adjust ILS programs to match classroom objectives. Teachers need the opportunity to become familiar with the ILS program and its features. Optimal use of these ILS features will be reduced unless teachers receive on-going training until they can comfortably use the ILS management system to meet student and classroom needs.

In order for integration to occur, teachers must receive adequate training regarding effective strategies for integration. According to Blickhan (1992), it is important for teachers to bridge what is occurring in the classroom with the student's ILS experience on a regular basis. Research suggests that students gain the most from computer experiences if they are reinforced with specific concrete activities (Haugland, 1992). Teachers should use hands-on materials in the classroom to teach a particular concept and then continue developing the concept through ILS format using the ILS resequencing feature. For example, as students are learning how to count money in the classroom as a hands-on

activity, follow-up lessons could be programmed on the ILS regarding the counting of money as a way to integrate the ILS and classroom curriculum. This type of strategy could be used through small-group instruction or one-on-one tutorials.

Teacher Views Regarding ILS Training

The third research question was used to investigate how teachers viewed the training they received in ILS use. A significant finding regarding staff training was revealed through teacher descriptions of training they received in ILS use. Teacher comments regarding training included (1) too much information was given at one time, (2) training was hurried and rushed, (3) training should have occurred throughout the year, and (4) teachers had to spend a lot of time on their own to learn the program. Staff training must be carefully designed to meet the needs of teachers. Training must be on-going throughout the time of implementation in order for teachers to become familiar with an ILS program.

Training that presents too much information at one time does not contribute to teachers becoming adequately familiar with an ILS system in order to effectively use an ILS to its maximum potential. Training sessions need to be designed to focus on specific aspects of the ILS as opposed to giving an abundance of information in a short amount of time. Data from this study revealed that four out of five teachers reported a need for further training in ILS use. In this study, Teacher Three was a good example of what can develop when teachers are not adequately supported as new programs are being implemented.

Teacher Three rated herself below mastery in basic computer operations. She described her training as "too much information at one time." Daily schedules did not permit her time to read ILS manuals. She stated such problems as students not having time to finish lessons, students being frustrated with difficult lessons, placing all students at first grade level as a requirement, and not being able to adjust programs. At the end of two years of implementation, Teacher Three stated more training was needed, but she didn't like the program and did not care if they had any more training or not.

Teacher Three was placed in the ILS without sufficient computer skills. Without on-going training and support, it appears she was frustrated at the end of two years. Staff meetings could have helped in addressing problems and any misunderstandings that may have existed.

In this study, teacher responses indicated that the use of regular meetings as a support system for ILS use did not occur. Teachers commented they were left on their own to figure out how to use the ILS once initial training was completed. Support systems between training sessions are necessary in order that a teacher's knowledge of the ILS system may be enhanced.

It is worth noting that four out of five teachers in this study agreed that regular meetings would be beneficial. It is a compliment to these teachers that most of them still expressed a willingness to want to work together to improve their use of an ILS two years after implementation.

Future Research, Practice, and Teacher Preparation

This study revealed that the use of an ILS still has not reached its maximum potential. Even almost ten years after Van Dusen and Worthen (1992) identified at least four essential components necessary for ILS use, effective implementation still has not occurred. Schools that implement ILSs must become aware of previous research regarding ILS use in order to effectively and adequately use ILS systems.

If use of the ILS is to reach its maximum potential, specific staff training is crucial. When implementing technology, administrators must be aware of the teachers' current level of technological abilities. Specific staff training must be designed to meet the different levels and abilities of teachers if the ILS is to become a successful part of the school environment. "When teachers are active in identifying their professional development needs–planning a program, selecting trainers and actual implementation–the likelihood of the program being able to affect change is dramatically enhanced" (Lauro, 1995, p. 65).

Teachers who exhibit below mastery levels in computer use and file management cannot be expected to implement technology programs such as an ILS system on their own. Not only must teachers receive initial training in computer use, but regular meetings must be conducted as support systems in order that teachers can become familiar with technology programs and have questions answered during this learning process (Siegel, 1995).

For ILSs to be used to their maximum potential, teachers must receive specific training regarding all of the available features that the ILS management system provides.

Teachers must be able to produce the reports generated by the ILS in order to adequately address student needs and weaknesses. On-going meetings and training must be provided to teachers where ideas and activities can be shared to enhance ILS use.

Integration of the ILS and classroom curriculum is imperative in order that one basic curriculum can be developed. Otherwise the ILS and the classroom will function as two separate entities which is not conducive to overall student learning (Blickhan, 1992; Haugland, 1992). Staff training must be specifically designed to address integration. Training must be designed to instruct teachers in the way that classroom activities can be used to enhance ILS use.

Teachers must also receive specific training in how to effectively use the ILS management system to correspond with classroom objectives. Teachers should meet on a regular basis to develop strategies that will address student needs through a combination of ILS activities and classroom activities that are supportive of each other. Teachers must receive hands-on skills with computers along with instructional strategies if successful integration methods are to be developed.

Effective staff training is crucial if the use of an ILS within a school environment is to reach its maximum potential. According to Siegel (1995), "sixty percent of schools or districts offer technology staff development only twice a year or less" (p. 48). School funding of technology implementation must not only include the hardware and software but adequate teacher training as well.

This study was significant in two respects. The results strongly suggested that an ILS is still not being used to its maximum potential. The results of this study also say something about the way that staff training should be conducted. The literature regarding

ILS has addressed the need for staff training. However, this study revealed that the manner in which training is conducted should to be specifically addressed. Instead of a general overview of computer programs in which mass information is given in small amounts of time, specific guidelines for training over an extended period of time needs to be developed.

The implementation of technology within the school setting is not easily achieved. Wortman (1996) studied the implementation of an ILS within schools and compared the findings to Fullan's theory on educational change. Findings indicated that schools were not including all teachers in the adoption phase, change in teaching practices took time, and views of the teachers were mixed as to whether new materials would continue to be used.

Mills and Ragan (1998) conducted a study regarding the role of teachers using as ILS in implementing technology as a focus of systematic change. The findings from this study provided evidence that teacher use of an ILS varies. They concluded that "specific operational components of the ILS must be communicated to teachers so they understand what the program looks like when it is fully functioning" (p. 9).

Guidelines regarding specific staff development must be designed to meet the needs of teachers who are implementing an ILS. Specific training sessions must be offered that address the importance of teacher involvement and integration of the ILS with classroom curriculum. It is only through specific on-going training sessions that maximum use of an ILS to assist student learning will be realized.

Recommendations for Future Research

This case study was limited to the views of five female teachers regarding their use of an ILS two years after initial implementation. The findings revealed that the use of an ILS within a school setting is still being used at a very low level. More research is needed to determine adequate strategies for implementation of ILSs. The following suggestions are offered as recommendations for future research:

- Study to explore views of administrators regarding how teachers can be effectively trained to use computer programs.
- Study comparing how many schools have established technology plans and the funding provided for such plans.
- Study using the findings from this study and compare findings to other schools that have implemented an ILS.
- Study to explore the types of training strategies used by schools that have successfully implemented an ILS.
- Study to compare teacher views regarding training received only with initial implementation versus on-going, one-year training which addresses teacher needs.
- Study the way that teacher training affects the manner in which teachers actively monitor students in an ILS session as a resource person.
- Study to determine which teacher strategies produce greater integration of the ILS with classroom curriculum.

- Study to examine the views of kindergarten teachers who use an ILS to determine if ILSs are appropriate for that age level.
- Study to compare the views of female teachers using an ILS with male teachers using an ILS.

Final Comments

This study revealed that almost ten years after Van Dusen and Worthen's (1992) studies, the use of the ILS still has not reached its maximum potential. Findings from this study revealed that three components of effective implementation have been implemented at a very low level. There is considerable cost to school districts when implementing technology programs. Failure to implement these programs adequately and effectively is not a wise investment of school funding.

As we begin the 21st century, schools are seeking ways that can challenge as well as meet the needs of students. Increased use of technology within the school setting will not occur with only a few training sessions provided at the onset of implementation of any new program. Schools must establish yearly goals regarding staff training so that the use of technology will be improved. Specific teacher needs must be identified as well as addressed. Integration of these programs must coincide with a classroom curriculum if learning is to be conducive for all students.

All of these components must be in place before maximum potential of an ILS program can be fully realized. These components must be developed to their fullest before one will be able to investigate the extent in which technology programs actually affect student achievement.

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APPENDIXES

APPENDIX A

INSTITUTIONAL REVIEW BOARD

APPROVAL FORM

OKLAHOMA STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD

Date: November 29, 1999 IRB #: ED-00-179

Proposal Title: "AN INTERPRETATIVE CASE STUDY OF TEACHER VIEWS CONCERNING THE EFFECTIVE USE OF AN INTEGRATED LEARNING SYSTEM"

Principal Investigator(s): Dr. Margaret Scott
Carolyn Gregory

Reviewed and Processed as: Exempt

Approval Status Recommended by Reviewer(s): Approved

Signature:

Carol Olson, Director of University Research Compliance — November 29, 1999 Date

Approvals are valid for one calendar year, after which time a request for continuation must be submitted. Any modification to the research project approved by the IRB must be submitted for approval with the advisor's signature. The IRB office MUST be notified in writing when a project is complete. Approved projects are subject to monitoring by the IRB. Expedited and exempt projects may be reviewed by the full Institutional Review Board.

APPENDIX B

SCHOOL CONSENT FORM

To: Superintendent of Harrah Public Schools
To: Principal of Virginia Smith Elementary

I am seeking to conduct a research study as part of an investigation entitled A CASE STUDY OF TEACHER VIEWS CONCERNING THE EFFECTIVE USE OF AN INTEGRATED LEARNING SYSTEM. The research study is being conducted through Oklahoma State University. The purpose of the study is to investigate the use of an integrated learning systems (ILS) by teachers in order to determine if the ILS is being used to its maximum potential to assist students in beginning reading.

The study will consist of interviews with five teachers who are currently using an integrated learning system. Interviews will take place after the school day. Several observations will take place during the time that teachers are conducting lab sessions with students. Every attempt will be made to not interfere with student learning.

The interviews and observations will be kept strictly confidential and will be available only to the researcher and members of the researcher's doctoral committee. Excerpts from the interviews and observations may be made part of the final research report, but under no circumstances will the name of the participants, school or identifying characteristics be included in this report.

I am seeking your permission to conduct the study in the spring of 2000. This study is in partial requirement of the Doctoral Program at Oklahoma State University. Please sign below if your permission is granted.

_____Date_____(a.m./p.m.)
Signature of Superintendent

_____Date_____(a.m./p.m.)
Signature of Principal

_____Date_____(a.m./p.m.)
Signature of Researcher

APPENDIX C

PARTICIPATION CONSENT FORM

CONSENT FORM

(To be read by participant and discussed with interviewer before the beginning of the initial computer questionnaire. One copy of this form will be left with the participant, and one copy will be signed by the participants and kept by the interviewer.)

I,_____, hereby authorize Carolyn Gregory to perform the procedures described below.

This study is being conducted as part of an investigation entitled AN INTERPRETATIVE CASE STUDY OF TEACHER PERSPECTIVES CONCERNING THE EFFECTIVE USE OF AN INTEGRATED LEARNING SYSTEMS. This research study is being conducted through Oklahoma State University. The purpose of the study is to investigate the use of an integrated learning system (ILS) by teachers in order to determine if the ILS is being used to its maximum potential. Participants will be asked to answer a number of questions. The interview will be taped and transcribed by the researcher. Participants will be observed during ILS lab sessions. The researcher will record the activities of the teacher during the lab sessions. Each participant is asked to complete a self-evaluation questionnaire to establish a level of computer experience.

I understand that participation is voluntary and that I will not be penalized if I choose not to participate. I also understand that I am free to withdraw my consent and end my participation in this project at any time without penalty after I notify the project director. The interview, observation, and questionnaire will be kept strictly confidential and will be available only to the researcher and members of the researcher's doctoral committee. Excerpts from the interview and observation may be made part of the final research report, but under no circumstances will my name, school or identifying characteristics be included in this report.

I may contact Carolyn Gregory at (405) 454-1900. I may also contact Sharon Backer, IRB Executive Secretary, Oklahoma State University, 203 Whitehurst, Stillwater, OK 74078. Phone: (405) 744-5700.

Signed_____ Date:_____Time_____(a.m./p.m.)
signature of participant

I testify that I have personally explained all aspects of this form to the participant before asking him/her to sign it.

Signed_____, Researcher

APPENDIX D

SELF-EVALUATION SURVEY

An Educator's Guide to Evaluating the Use of Technology in Schools and Classrooms - December 1998

CODE 77 Self-Evaluation Rubrics for Basic Teacher Computer Use

Please rate your level of achievement in each of the following competencies.
Circle the number that best reflects your current level of skill attainment.

I. Basic computer operation

Level 1	I do not use a computer.
Level 2	I can use the computer to run a few specific, preloaded programs. It has little effect on either my work or home life. I am somewhat anxious I might damage the machine or its programs.
Level 3	I can set-up my computer and peripheral devices, load software, print, and use most of the operating system tools like the scrapbook, clock, note pad, find command, and trash can (recycling bin). I can format a data disk.
Level 4	I can run two programs simultaneously, and have several windows open at the same time. I can customize the look and sounds of my computer. I use techniques like shift-clicking to work with multiple files. I look for programs and techniques to maximize my operating system. I feel confident enough to teach others some basic operations.

II. File management

Level 1	I do not save any documents I create using the computer.
Level 2	I save documents I've created but I cannot chose where they are saved. I do not back-up my files.
Level 3	I have a filing system for organizing my files, and can locate files quickly and reliably. I back-up my files to floppy disk or other storage device on a regular basis.
Level 4	I regularly run a disk-optimizer on my hard drive, and use a back-up program to make copies of my files on a weekly basis. I have a system for archiving files which I do not need on a regular basis to conserve my computer's hard drive space.

CODE 77 Self-Evaluation Rubrics for Basic Teacher Computer Use

III. Word processing

Level 1	I do not use a word processor, nor can I identify any uses or features it might have which would benefit the way I work.
Level 2	I occasionally use the word processor for simple documents which I know I will modify and use again. I generally find it easier to hand write or type most written work I do.
Level 3	I use the word processor for nearly all my written professional work: memos, tests, worksheets, and home communication. I can edit, spell check, and change the format of a document. I can paginate, preview and print my work. I feel my work looks professional.
Level 4	I use the word processor not only for my work, but have used it with students to help them improve their own communication skills.

IV. Spreadsheet use

Level 1	I do not use a spreadsheet, nor can I identify any uses or features it might have which would benefit the way I work.
Level 2	I understand the use of a spreadsheet and can navigate within one. I can create a simple spreadsheet which adds a column of numbers.
Level 3	I use a spreadsheet for several applications. These spreadsheets use labels, formulas and cell references. I can change the format of the spreadsheets by changing column widths and text style. I can use the spreadsheet to make a simple graph or chart.
Level 4	I use the spreadsheet not only for my work, but have used it with students to help them improve their own data keeping and analysis skills.

V. Database use

Level 1	I do not use a database, nor can I identify any uses or features it might have which would benefit the way I work.
Level 2	I understand the use of a database and can locate information within one which has been pre-made. I can add or delete data in a database.
Level 3	I use databases for a personal applications. I can create an original database - defining fields and creating layouts. I can find, sort and print information in layouts which are clear and useful to me.
Level 4	I can use formulas with my database to create summaries of numerical data. I can use database information to mail merge in a word processing document. I use the database not only for my work, but have used it with students to help them improve their own data keeping and analysis skills.

CODE 77 Self-Evaluation Rubrics for Basic Teacher Computer Use

VI. Graphics use

Level 1	I do not use graphics in my word processing or presentations, nor can I identify any uses or features they might have which would benefit the way I work.
Level 2	I can open and create simple pictures with the painting and drawing programs. I can use programs like PrintShop or SuperPrint.
Level 3	I use both pre-made clip art and simple original graphics in my word processed documents and presentation. I can edit clip art, change its size, and place it on a page. I can purposefully use most of the drawing tools, and can group and un-group objects. I can use the clipboard to take graphics from one application for use in another. The use of graphics in my work helps clarify or amplify my message.
Level 4	I use graphics not only for my work, but have used it with students to help them improve their own communications. I can use graphics and the word processor to create a professional looking newsletter.

VII. Hypermedia use

Level 1	I do not use hypermedia (HyperStudio), nor can I identify any uses or features it might have which would benefit the way I work.
Level 2	I can navigate through a pre-made hypermedia program.
Level 3	I can create my own hypermedia stacks for information presentation. These stacks use navigation buttons, sounds, dissolves, graphics, and text fields. I can use an LCD projection device to display the presentation to a class.
Level 4	I use hypermedia with students who are making their own stacks for information keeping and presentation.

VIII. Network use

Level 1	I do not use the on-line resources available in my building, nor can I identify any uses or features they might have which would benefit the way I work.
Level 2	I understand that there is a large amount of information available to me as a teacher which can be accessed through networks, including the Internet. With the help of the media specialist, I can use the resources on the network in our building.
Level 3	I use the networks to access professional and personal information from a variety of sources including networked CD-ROM reference materials, on-line library catalogs, the ERIC database, and the World Wide Web. I have an e-mail account that I use on a regular basis.

CODE 77 Self-Evaluation Rubrics for Basic Teacher Computer Use

Level 4	Using telecommunications, I am an active participant in on-line discussions, can download files and programs from remote computers. I use telecommunications with my students.

IX. Student Assessment

Level 1	I do not use the computer for student assessment.
Level 2	I understand that there are ways I can keep track of student progress using the computer. I keep some student produced materials on the computer, and write evaluations of student work and notes to parents with the word processor.
Level 3	I effectively use an electronic grade book to keep track of student data and/or I keep portfolios of student produced materials on the computer. I use the electronic data during parent/teacher conferences.
Level 4	I rely on the computer to keep track of outcomes and objectives individual students have mastered. I use that information in determining assignments, teaching strategies, and groupings.

X. Ethical use understanding

Level 1	I am not aware of any ethical issues surrounding computer use.
Level 2	I know that some copyright restrictions apply to computer software.
Level 3	I clearly understand the difference between freeware, shareware, and commercial software and the fees involved in the use of each. I know the programs for which the district or my building holds a site license. I understand the school board policy on the use of copyrighted materials. I demonstrate ethical usage of all software and let my students know my personal stand on legal and moral issues involving technology. I know and enforce the school's technology policies and guidelines, including its Internet Acceptable Use Policy. I have a personal philosophy I can articulate regarding the use of technology in education.
Level 4	I am aware of other controversial aspects of technology use including data privacy, equitable access, and free speech issues. I can speak to a variety of technology issues at my professional association meetings, to parent groups, and to the general community.

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APPENDIX E

INTERVIEW QUESTIONS

INTERVIEW QUESTIONS

Date:_____ Time: _____
Place of interview:
Tape #
Transcribed by:
Teaching experience:

The following questions pertained to the teachers' overall view of the Integrated Learning System (ILS) program that is currently implemented in their school site.

1. How would you describe the effectiveness of an Integrated Learning System (ILS) on student learning?

   a. What do you consider to be the strengths, if any, of the ILS program?
   b. What do you consider to be the weaknesses, if any, of the ILS program?
   c. Were you involved in the initial decision to implement the ILS program?

The following questions pertained to teacher involvement with the ILS.

2. How would you describe the role of the teacher during an ILS lab session?

   a. Describe what a typical ILS lab session would be like for you.
   b. What do you do during an ILS lab session if you observe a student having difficulty understanding a particular skill?
   c. What do you do during the time that students are not signaling with their blue cups?
   d. How is the seating arrangement in the computer lab determined for your class?
   e. Does the seating arrangement ever change?

3. How do you use the student reports generated by the ILS management system?

   a. Which student reports, if any, do you use?
   b. How often do you access student reports?
   c. Are the reports easy for you to use? If no, explain.
   d. Do you ever have to adjust the level of the program for a student? If yes, explain.

e. Do you conduct conferences with students and parents regarding the students' performance on the ILS? If yes, explain.

The following questions related to the integration of the ILS program with classroom curriculum.

4. In your opinion, how do you view the ILS program as it relates to the regular classroom curriculum?

a. Do you view the ILS program as part of the regular curriculum or as supplemental? Please explain.
b. Do you think that students should receive a grade for their performance on the ILS? Please explain.

5. How do you use the management system of the ILS to change and resequence lessons within the program to match the objectives of your classroom curriculum?

a. What do you do if you observe on student reports that a student is low in a particular area?

The following questions related to the staff training that was provided to the teachers regarding the use of the ILS program.

6. How would you describe the training you received regarding the use of the ILS program?

a. Describe the features of the ILS management system that you are comfortable using?
b. How did the staff training prepare you to effectively use the reports generated from the ILS management system?
c. How did the staff training prepare you to effectively use the ILS with your classroom curriculum?
d. Describe any area of the ILS program that you feel additional training would be beneficial?

7. Does your school conduct regular meetings to address concerns and needs of the teachers regarding the use of the ILS program?

a. In what ways do you believe that teachers could benefit from meetings held regularly to address concerns regarding the use of the ILS?

APPENDIX F

TEACHER SELF-EVALUATION SURVEY

RESULTS

Teacher Self-Evaluation Survey Results

X under each teacher denotes mastery level in that area.

Area	Teacher				
	One	Two	Three	Four	Five
Basic Computer Operation	X	X			
File Management		X	X		X
Word Processing		X	X	X	X
Spreadsheet Use			X		
Database Use					
Graphics Use	X	X			
Hypermedia Use					
Network Use	X	X	X	X	X
Student Assessment	X	X		X	
Ethical Use Understanding	X	X		X	

APPENDIX G

SUMMARY OF OBSERVATION DATA REGARDING

TEACHER INVOLVEMENT WITH THE ILS

Summary Of Observation Data Regarding
Teacher Involvement With The ILS

Participant	Served as Resource	Actively Monitored Students	Printed ILS Reports
Teacher One	yes	yes	yes
Teacher Two	yes	yes	yes
Teacher Three	yes	no	no
Teacher Four	yes	no	no
Teacher Five	yes	no	no

APPENDIX H

SUMMARY OF ILS INTEGRATION DATA

Summary of ILS Integration Data

Participant	View of ILS With Classroom	View of ILS	Views Regarding Grades
Teacher One	believes it relates well to classroom curriculum	supplemental	none should be given
Teacher Two	sees ILS as great reinforcement	curriculum	none should be given
Teacher Three	ILS offers some skill practice, but not a whole lot else	curriculum	none should be given
Teacher Four	excellent review, close correlation to classroom	supplemental	none should be given
Teacher Five	ILS seen as close correlation to classroom curriculum	supplemental	none should be given

Data also suggested the following:

1. None of the teachers used the resequencing feature of the ILS management system to correlate ILS lessons with classroom curriculum.

2. Teachers making references to classroom activities as a means of further explanation to students needing assistance while working on the ILS was very minimal.

3. Some integration was noted between ILS use and the classroom as teachers stated they work with students in small groups or give one-on-one instruction in the classroom if further assistance is needed for ILS work.

VITA[2]

Carolyn Ann Gregory

Candidate for the Degree of

Doctor of Education

Thesis: A CASE STUDY OF TEACHER PERSPECTIVES CONCERNING THE EFFECTIVE USE OF AN INTEGRATED LEARNING SYSTEM

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Education: Graduated from Harrah High School, Harrah, Oklahoma in May, 1968; received Bachelor of Science degree in both Elementary Education and Home Economics from East Central University, Ada, Oklahoma in May, 1972; received the Master of Science degree in Reading and received Reading Specialist certification from University of Central Oklahoma, Edmond, Oklahoma in May, 1976. Completed the requirements for the Doctoral of Education degree in Curriculum and Instruction at Oklahoma State University, Stillwater, Oklahoma in December, 2000.

Experience: Employed by Earlsboro Public Schools as a kindergarten teacher for one year, Choctaw Public Schools as a first and second grade teacher for three years, Harrah Public Schools as a first grade teacher for eleven years and transitional first grade teacher for thirteen years.

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