DOCUMENT RESUME

ED 398 905 IR 018 111

AUTHOR	Johnson, Jacqueline S.
TITLE	Adaptation and Implementation of Curriculum for a High School Special Education Computer Science Class.
PUB DATE	Jun 96
NOTE	91p.; Masters Practicum, Nova Southeastern University.
PUB TYPE	Dissertations/Theses - Practicum Papers (043) -- Tests/Evaluation Instruments (160)
EDRS PRICE	MF01/PC04 Plus Postage.
DESCRIPTORS	*Computer Literacy; *Computer Science Education; Computer Software; Computer Uses in Education; *Curriculum Development; Curriculum Guides; Data Processing; High Schools; Instructional Effectiveness; Instructional Materials; Keyboarding (Data Entry); *Learning Disabilities; Pretests Posttests; Required Courses; Special Classes; *Special Education; Spreadsheets; Word Processing

ABSTRACT

A curriculum was developed to address the needs of a high school special education computer science class. Class members included both resource-room learning disabled and the more severely learning disabled, and the project aimed to help them fulfill the school district requirement of the completion of a one-semester computer class prior to graduation. The project objectives were to develop a curriculum for the course which received 90% acceptance by a committee of administrators and teachers, and to improve both student computer literacy skills and computer application skills by 50%. The curriculum was developed based on research of existing curriculums and available materials at the site, such as text, computers, and software. It included keyboarding, word processing, database, and spreadsheet skills. The curriculum was implemented using auditory and visual modes with paper/pencil and hands-on activities, with review and reinforcement activities. All objectives were met for the target group. Appendices include a needs assessment survey, an interview and rating scale form for the staff, computer literacy and applications pretests and posttests, a sample study guide and outline, and the developed curriculum. (Contains 17 references.) (Author/SWC)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☐ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.

● Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

ED 398 905

ADAPTATION AND IMPLEMENTATION OF CURRICULUM FOR A HIGH SCHOOL SPECIAL EDUCATION COMPUTER SCIENCE CLASS

by

Jacqueline S. Johnson

A Practicum Report

Submitted to the Faculty of the Abraham S.Fischler Center for the Advancement of Education of Nova University in partial fulfillment of the requirements for the degree of Master of Science.

The abstract of this report may be placed in a National Database System for reference.

June/1996

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Jacqueline Johnson

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

IR018111

BEST COPY AVAILABLE

Abstract

Adaptation and Implementation of Curriculum for a High School Special Education Computer Science Program. Johnson, Jacqueline S., 1996. Practicum Report, Nova University, Abraham S.Fischler Center for the Advancement of Education.
Descriptors:High School/Computer Science/Computer Application/Computer Curriculum/Learning Disabled/Severe Learning Disabled/Special Programs/Special Education/Resource Room.

A curriculum was needed developed to address the needs of a high school special education computer science class. The school district requirement is for a one semester class for graduation from high school. The class consisted of resource room learning disabled students and special program (more severely learning disabled) students. The objectives were to design a curriculum for a one semester course for the high school special education computer science class which has a 90 percent acceptance by a committee composed of administrators and teachers. The second and third objectives involved implementing portions of the curriculum to improve both student computer literacy skills and computer application skills by 50 percent. The curriculum was developed based on research of current curriculums in use and available materials such as text, computers, and software at the site. The curriculum was implemented using auditory and visual modes with paper/pencil and hands on activities. Review and reinforcement activities were included. All objectives were met for the target group. Appendices include a rating scale of curriculum for staff,an administrator interview form for curriculum,curriculum critique form,pretest and posttest for computer literacy,pretest and posttest for computer applications,sample study guides and outlines,and the developed curriculum.

Authorship Statement

I hereby certify that this paper and the work it reports are entirely my own. When it has been necessary to draw from the work of others,published or unpublished,I have acknowledged such work in accordance with accepted scholarly and editorial practice. I give this testimony freely, out of respect for the scholarship of other professionals in the field and in hope that my own work, presented here, will earn similar respect.

Jacqueline S Johnson
Student's signature

Document Release

Permission is hereby given to Nova University to distribute copies of this applied research project on request from interested parties. It is my understanding that Nova University will not charge for this dissemination other than to recover the costs of duplicating,handling,and mailing of the materials.

Jacqueline S Johnson
Student's signature

6/24/96
date

NOVA UNIVERSITY
Abraham S. Fischler Center
for the Advancement of Education

OBSERVER'S VERIFICATION FORM

Verification of Practicum Activity

Dear Observer:

Practicum students in Nova's M.S. and Ed.S. programs are asked to provide external verification that the project activities reported in their final practicum documents took place as described. You have been designated an observer to fulfill this confirmation function by the student named below. On this sheet, then, please write a note attesting to your knowledge of the project activity described in the final practicum report to which this will be attached. (Note that you are not asked to evaluate or make judgments about the quality of the project.)

Practicum Title Adaptation and Implementation of Curriculum for a High School Special Education Computer Science Class

Student's Name Jacqueline S. Johnson

Project Site Western High School Date June 4,1996

Observer's Name Thomas Khamis *please print* T. Khamis *please sign*

Observer's position Teacher Phone #(702) 799-4080

Observer's comment on impact of the project (handwritten):

Project will greatly change the methods and materials used in the computer class. Doable projects were more used. Students were more involved in the class.

Table of Contents

page
Title Page....................................i

Abstract....................................ii

Authorship Statement/Document Release................iii

Observer's Verification..........................iv

Table of Contents..................................v

List of Tables....................................vii

Chapters

I. Purpose..1

II. Research and Solution Strategies................10

III. Method..23

IV. Results..32

V. Recommendations..............................40

Reference List....................................42

Appendices

Appendix A: Needs Assessment Survey................45

Appendix B: Structured Interview Questions.........47

Appendix C: Evaluation of Curriculum for Special Education Computer Science Class Critique Form.........................49

Appendix D: Computer Literacy Pretest..............53

Appendix E: Computer Applications Pretest..........58

Appendix F: Computer Literacy Posttest.............60

Appendix G: Computer Applications Posttest.........65
Appendix H: Sample Outline and Study Guide.........67
Appendix I: Proposed Curriculum....................74

List of Tables

Table 1: Responses of Seven Special Education Staff to Needs Assessment Survey on the Need For Special Education Computer Science Curriculum............. 5

Table 2: Responses by Administrators to Structured Interview Questions on the Need for a Special Education Data Processing Curriculum.................. 6

Table 3: Summary of Reviewers Critique of Curriculum.......................... 34

Table 4: Pretest and Posttest Results for Computer Literacy for Students in the Special Education Computer Science Class.......................... 36

Table 5: Pretest and Posttest Results for Computers Applications for Students in the Special Education Computer Science Class........................ 38

CHAPTER I

Purpose

Background

The community where the project to develop a special education computer science curriculum was carried out was located in the Southwestern United States. There were both urban and rural areas having a population of nearly 1,000,000 people. The population was somewhat transient.

A majority of the area's jobs are in the service industry. The area is experiencing significant job growth and a substantial increase in population. Both skilled and unskilled labor is in demand.

The school district is one of the ten largest in the United States. It was having to accommodate an increased growth rate of seven and six-tenths percent. The district covered 7,910 square miles and included urban and rural components. The school population was around 65 percent white and 35 percent minority. There are 184 schools. One hundred and twenty-seven are elementary (grades kindergarten through fifth), 27 middle school (grades sixth through eighth), and 24 are senior high schools (grades ninth through twelfth).

Students in the district performed at or above the national average on standardized tests with mathematics being higher than reading or language. Twelfth grade students are required to pass state-developed proficiency tests in mathematics, reading, and language.

The drop-out rate is around ten percent and is influenced by the availability of jobs that provided adequate starting wages. A high credit requirement for graduation is thought to deter students who have failed classes.

Students have opportunities for accelerated classes, vocational schools, non-traditional high school programs, and remedial programs. The district offers campuses for the sciences, arts, technologies, and tourism. Additionally, a full range of special education services are available for all areas of challenge including resource rooms, specialized programs, special campuses, second language programs, and regular classroom support for mainstreamed students.

The school where the practicum project was done is a senior high school located in a facility that is over 30 years old. The enrollment is half that of other district senior high schools and the population was around 1,885.

Ninth grade students in this school lagged slightly behind the district averages in reading, mathematics, and language on standardized tests. The number of students who passed the state's twelfth grade proficiency tests were equivalent to the overall district percentages. Slightly fewer students took the American College Test (ACT) and the Scholastic Aptitude Test (SAT) in the school than in the district. Student scores were not significantly different between the school and the district on both the ACT and SAT.

The author is licensed by the state to teach elementary education (kindergarten through eighth grade), special education resource room (kindergarten through twelfth grade) and has an endorsement to teach computer applications. The author holds a bachelor of science degree in special education with minors in elementary education and mathematics. The author was assisting and/or monitoring several students in the special education computer science class.

Permission was secured from the school administration and the current instructor to design and implement a curriculum for the special education computer science class.

Problem Statement

Course content for the special education computer science program focused on keyboarding, word processing, database, and spreadsheets using the ClarisWorks software. The instructor provided assignments from regular education materials and self-created materials. There are enough computers in the lab to allow a one to one match of students and computers.

The target group for the study was a special education class in computer science education in a resource class. Resource classes are departmentalized and comprised of students with moderate learning disabilities or emotional handicaps. Students rotate from teacher to teacher each period. Students with more severe disabilities are allowed to take the class with an aide available to help. There were 16 students in the class with an even split between students in the resource program and students from the severely learning disabled program.

Students were in the class because the district requires one-half credit (one semester) of computer science education to graduate with a regular diploma. The district has no set curriculum for computer science education nor does the school.

Students in the computer class had a wide range of ability and achievement levels. Stanine scores on standardized achievement tests were three or less. According to the individual education plans and psychological reports students had achievement scores in reading, mathematics, and language ranging from kindergarten through sixth grade.

According to a needs assessment survey (Appendix A:45), responded to by seven of the nine special education teachers, a need for a set curriculum in computer applications for special populations was seen. The respondents indicated the curriculum needed to address both the academic goals of the students and to prepare them with skills for entry level jobs requiring some computer literacy.

Table 1

Responses of Seven Special Education Staff to Needs Assessment Survey on the Need for Special Education Computer Science Curriculum

Question	Responses:	
	Yes	No
Need for a curriculum for the special education data processing?	7	0
Would a special education students' academic skills be enhanced by a curriculum?	7	0
Would students' job skills be enhanced?	7	0

During structured interviews (Appendix B:47) with the four building administrators, a need was indicated for a computer applications curriculum that would improve written communication skills for students in their area of challenge through the use of computer applications. Students needed to be able to recognize and correct problems using the computer. A more vocational and life skills approach to instruction was favored by the administrators. Desired curriculum units included practice in data entry, programs teaching personal financial planning, units teaching problem solving and following directions, and the use of calculator functions.

Table 2

Responses by Administrators to Structured Interview Questions on the Need for a Special Education Data Processing Curriculum

Question	Responses: Yes	No
Need for a curriculum for special education computer science class?	4	0
Would a curriculum enhance students' academic skills?	4	0
Would a curriculum enhance students' job skills?	4	0

Additionally, students in the computer science special education class did not seem motivated to learn the skills being taught. This was seen to be a problem with the basic curriculum being used. Most students began the assignments but encountered problems reading the instructions or finding their way into the computer functions needed to accomplish a task. At that point, students discontinued working until they received one-to-one assistance. With only one teacher and occasionally one additional helper the students sometimes had a significant wait time for help. The unstructured time then resulted in inappropriate horseplay and acting out behaviors. Other students who were working sometimes became distracted and joined in. Few assignments were completed.

The discrepancy identified was that there was no curriculum for the special education computer science program that met the needs of the students typically found in that program, and there was a need for a curriculum to be designed that met the needs of the special education population where they could learn useful skills for future jobs and experience success. This practicum project developed and implemented a curriculum for special populations that addressed this discrepancy.

Outcome Objectives

The objectives for this practicum project involved designing a computer science curriculum to use for special education populations, implementing the curriculum to improve computer literacy and implementing the curriculum to improve computer application knowledge.

The proposed objectives were...

1. Within the first three weeks of this practicum project the author will develop a specialized computer application curriculum for high school special education students with a 90 percent acceptance of confidence as measured by a peer review critique form.(Appendix C:49)

2. By the end of this 12 week practicum project the 16 high school special education students will demonstrate a 50 percent increase in basic computer literacy skills as measured by a teacher made pretest and posttest. (Appendix D:53) (Appendix E:58)

3. By the end of this 12 week practicum project the 16 high school special education students

participating in this practicum will demonstrate a 50 percent increase in computer application knowledge as measured by a teacher developed pretest and posttest. (Appendix F:60) (Appendix G:65)

CHAPTER II

Research and Solution Strategy

The use of computers has become an integral part of daily life in the work setting, schools, and in many homes. Students who are not able to perform simple functions and activities on the computer limit their employability and their choices of classes at the secondary level.

In a survey of 109 secondary schools and 19 post secondary schools in an area of a 250 mile radius of Memphis, Tennessee it was found that 97 percent of the schools offered courses using computers. Additionally, 89 secondary schools offered some type of programming course. (Boyce et al, 1988)

Three hundred and twenty-five businesses in the same area around Memphis were surveyed. Thirty-eight percent of businesses used packaged software. Keyboarding skills were required in 48 percent of the firms for entry level positions. Data entry personnel were used by 62 percent of the employers surveyed. (Boyce et al)

The Boyce study determined that there was an appropriate match in the geographical area between secondary school curriculum/courses and community employer needs. The students who participated in computer applications courses opened up a number of possible job opportunities for themselves.

As the world becomes more aware of the technology that exists even other countries are looking at the role of computer curriculum in society and schools. Soviet educators are being encouraged to evaluate the uses of computers to enhance the process of learning and joining with the information revolution world wide. Computer instruction is being coordinated with the mathematics and science curriculum. The goal is for students to become better computer users and to improve their academic skills in mathematics and science. (Kuznetzov, 1991)

Even in areas and smaller and more remote from the major world markets in countries such as the Fiji Islands the government initiated a Computer Education Center. The center investigated the means for introducing a computer curriculum into secondary schools. Their approach was to introduce computer science studies into the mathematics curriculum. (Prasad, 1991)

Moursund (1993) said that computer literacy skills could be categorized in a number of different ways. He referred to a "generic tools approach" (Moursund, 1993:3) using databases, graphics, spreadsheets, telecommunications, and word processing. These types of programs could be implemented in a number of different subject areas. Moursund (1993) gave as an example application software for a specific subject area such as music, art, or desktop-publishing. Computer programming was another model he suggested where computer literacy skills could be enhanced using programming languages such as Pascal, BASIC, or HyperCard. (Moursund, 1993)

Yet another route to computer literacy and computer curriculum was through an analysis unit. This type of course would use materials in which reading, discussing, and/or writing would be done on the past development of computers, current uses, and the effect of computers on society. This course might not use computers at all. (Moursund)

Moursund's Problem-Solving Models for Computer Literacy combined all of the types of computer literacy. Computer applications were brought into use in problem solving exercises and the ethics of the given situation are discussed.

Of relevance to special education curriculum were discussions of student's attitudes toward computers. Moursund suggested that students frequently believe they have a certain amount of ability that cannot be changed.

Students also believe that problem solving is something done only in math class. Moursund suggests that the aim of a computer literacy course is to change these student attitudes to the mind set of knowing that they are better at solving some types of problems than others, and that they are intelligent enough to learn to solve other kinds of problems. They need to be willing to spend the time to learn.

The Mississippi State Department of Education (1988) has developed the Standardized Curriculum for Business Technology which includes in the curriculum business training, information processing, business computer applications, and computer programming technology I and II. The course in business computer applications investigates safety, data management, word processing, spreadsheets, integrating applications, graphics, automated accounting, computerized filing, financial applications, and an introduction to BASIC programming language. No mention was made in the document of adaptations or considerations of special educations student's needs.

A curriculum guide for a course entitled Business Computer Applications I was developed for the Texas Education Agency. Topics in this guide included an introduction to computer related concepts, word processing, spreadsheets, database management, computer communications (to include telecommunications, computer graphics, desktop publishing, and business application software.), and social implications of computers. An appendix dealt with methods and materials for special needs students. The authors contended that the nature of business education employees a variety of learning styles and therefore modification may not be necessary. Modifications were primarily geared toward presenting materials in both auditory and visual modes, providing increments in units, review, repetition, pairing students with a peer, moving from simple to more complex, and allowing extra time. Recommendations were made for accessing counselors and special education teachers for additional help so instruction is provided in an integrated setting. (Patton and Murray, 1991)

Special student needs in computer courses are discussed in the New York City Board of Education publication (1986) of curriculum for the LOGO language. This curriculum for LOGO was designed for all grade levels kindergarten through senior high school. Using an electronic chalkboard where all students can see on a monitor how a technique is done may be used before students actually go to a computer station to work. Individualized software was used to provide activities at the students level. Problem solving was suggested to encourage special needs students to be more active in the language process. A need to provide both visual and auditory instruction was addressed particularly because working at a computer is an extremely visual activity.

The Association for Computing Machinery (ACM) with the Institute of Electrical and electronic Engineers-Computer Society (IEEC-CS) developed suggestions for computer science course curriculum. (1992) There are six models suggested by the ACM report. Applications can be used to address computer science education as well as applications plus programming. Yet another approach blends applications, computer science topics, and programming. Other methods include the use of projects in programming, apprenticeship, and advanced placement (AP) computer science. (Merritt et al, 1992)

An outline for a one semester introductory computer science course by Carol E. Wolf included such topics as algorithms, word processing, Logo, historical and societal impact of computers, ASCII code, chips, gates, circuits, and programming with Pascal.(Merritt et al)

In Secondary Special Education: A Guide to Promising Public School Programs (Warger and Weiner, 1987) computer technology trends in special education were discussed. For special learners computer use allowed a decrease in distractions, simplified steps and repetition, overlearning, modeling/demonstrating of skills or activities, prompts and cues, and reinforcement. At the secondary level special students especially are trying to be independent and in charge. Computer use allowed students to increase skills in both areas.

Part of California's Tri-County Consortium for Special Education integrated computers into all special education classrooms. Focus was on transition and independent learning activities to include working in the community. (Warger, Weiner)

Computers are used in special education classrooms as teaching aides. Students used them to learn keyboarding or to write simple programs in Kentucky's East Carter Special Education Department. Special students could also take special classes in business skills where computers were incorporated. (Warger and Weiner)

A major objective of Michigan's Resource Room at Caledonia High School was for students to obtain skill in using computer technology. To this end computers were used by students to acquire basic skills as well as for vocational training programs. (Warger and Weiner)

A computer curriculum was used at a technical school in Missouri by the Cross-Categorical Learning Resource Center. Skills in using the computer for academics as well as computer training were provided. The program's objective was to mainstream the students into society and provide career development. (Warger and Weiner)

The Jericho Secondary Learning Center in New York provided a special computer literacy program. Their aim was to move students into the regular education setting. (Warger and Weiner)

A computer usage program was one of the facets to a program employed by Maine in the Entrepreneurship-Transitional Training from the Classroom to the World of Work. Included in the curriculum were activities such as inputting financial and other types of records into the computer. (Warger and Weiner)

Massachusetts' Center for Occupational Awareness and Placement (COAP) operated in partnership with the Merrimack Special Education Collaborative. COAP was a simulated business environment which incorporated a software development company. Students used computers for drill/practice and business simulations. A number obtained jobs where they used computers at work. A few went on to work in high technology areas using computers. (Warger and Weiner)

While special education students may benefit from slight modifications to materials and systems used in regular education programs there are ready-made systems and programs available that are specifically designed to meet or do meet the needs of special populations. Many of the programs are application based simulations such as office procedures, keyboarding, accounting, filing, customer records, billing, inventory, and payroll. Other software has been developed to provide a more step-by-step introduction to applications such as typing, BASIC programming, accounting, and alphabetizing. (Florida State University, Tallahassee, 1988)

Research has been done with special education populations to determine if vocabulary can be better taught using computer assisted instruction (CAI) with a visual mode only or an auditory added to the visual. In addition the intelligibility of synthesized versus digitized speech was considered. Results indicated that a combination of visual with auditory was probably more effective. Digitized speech output appeared to be more effective but further studies would need to be done. (Hebert and Murdock 1994)

In a report on computer-supported writing for students with writing deficits Hunt-Berg et al (1994) suggested that there were a number of computer software features coming on the market that would be useful to special student populations. Talking word processors provided auditory feedback which allowed the writer to monitor the writing process. This included speech synthesis, pronunciation editing, and visual highlighting of words to be read. Spell checking functions allowed spelling to be corrected. Some software combined the spell checking feature with suggested correct spellings to be selected. Others carried it a step further allowing a search for correct spelling on a letter by letter basis and modifying root words when adding prefixes and suffixes. Word cuing and prediction features allow access to expanded vocabularies, correction of word tense, automatic capitalization and punctuation, and precoded abbreviations used to type longer frequently used phrases. Text organization and grammar correction were other useful features.

Speech output by computers has assisted special population students with auditory cues for learning vocabulary and language. It is a prompt that can be removed when no longer needed. Computers have also aided learning for special students who are strong visual learners. (Meyers, 1994)

Teaching programs for students with learning disabilities are thought to need several factors. Learners should control much of the learning process in that the program does not perform the tasks the learner needs to master. Students need to be challenged and curious about the subject matter being taught through computer interaction. Students must understand why an error was made. Graphics have sometimes been found to facilitate learning for special populations depending on the task, content, and learner characteristics. Consistent placement of functions on the screen helped students focus more on the task at hand and less on where to find the function. (Larsen, 1995)

Raskind, Herman, Torgesen (1995) suggested that using word processing software to compensate for academic deficits seems to have resulted in improved skills. More research needs to be done on how much remediation occurs with the use of computer technology to assist special population students.

Special education student's needs within the area of computer education are provided for in a number of different ways. Some schools develop curriculum and programs specifically for special populations. Other plans use the general education curriculum and make modifications and adaptations for special populations. Still other schools and curriculum guides do not feel the need for changes in the curriculum for special populations. A few of these do refer to using basic practices typically employed in teaching students with special needs.

Computer applications are taught and used in a variety of settings. Computer classes themselves maybe within a computer science department. Other schools teach computer skills within the science and/or mathematics department. Yet another strategy is to have computers available and utilized within every classroom. A number of schools provide for computer applications to be taught under the business education department.

Using application computer software appears to have the added benefit of improving special population student's academic performance. Furthermore, it offers the advantage of visual and auditory modes of learning. These improved skill appear to be transferred to paper pencil tasks.

Solution Strategy

The solution strategy for this practicum borrowed from a number of the programs reviewed in this chapter to fit within the constraints imposed by the school facility and district and state regulations and policies. At this time computer science education was a one semester course. ClarisWorks was the software available to be used on the computer, and it was at the discretion of the other teachers as to whether computers were accessed in any other areas of the curriculum. Computer curriculum and computer use was also dependent upon computer and computer laboratory availability which was limited. It was not possible to purchase new software or new equipment at this point.

Initially, in this computer science practicum, a curriculum was developed for special education populations. The designed curriculum was one semester long. Suggestions were made for students who would remain in the class for a second semester.

During the first three weeks of the practicum the curriculum was developed by the author and evaluated by staff members to include teachers, aides ,and administrators.

The final ten weeks of the practicum featured sections of the curriculum were implemented in the high school special education computer science class. Students in this program were given pretests designed by the author. The pretest measured knowledge of computer literacy concepts and knowledge of computer application.

Students experienced a variety of situations for learning and practicing skills in computer science literacy and applications. Both visual and auditory techniques were used to present materials, practice skills and use software. Student's progress was measured using an author developed posttest for computer literacy concepts and an application exercise.

CHAPTER III

Method

During the time this practicum was implemented a curriculum was developed for the special education computer science class. The curriculum was critiqued by a committee of staff and administrators from the special education department who have been directly involved in the special education computer science class. Selected parts of the designed curriculum were implemented for ten weeks.

Week One

Week one involved the developing of a curriculum for the special education computer science class. The curriculum was determined by and created based on the recommendations made by staff in the needs assessment survey and by the administrators in the structured interview. In addition the computer applications curriculum in the Clark County School District "Guide to Secondary Curriculum" (1981) was reviewed. Goals and objectives were developed and materials/methods were written. A list of suggested topics, methods, and materials was created for students remaining in the class for a second semester.

Week Two

Administrators and teachers informally reviewed the rough draft of the proposed curriculum for the special education computer science class. A decision was reached to design the curriculum in the same format used in the "Senior High 9-12 Special Education Curriculum" handbook (1980) using topics with goals and objectives and suggesting methods and materials.

A proposed curriculum was finalized. A copy of the curriculum (Appendix I:74) was passed out at the site to the administrator in charge of special education, the special education facilitator, all of the specialized program teachers, all the resource room teachers, and the special programs aide who regularly works in the computer class with the special programs students. All were given a copy of the critique form to fill out and bring to the meeting with them the following week.

Week Three

A committee met a the beginning of the week to discuss the proposed curriculum for the special education computer science class. In attendance at this meeting were the site administrator for special education, the special education department facilitator, one specialized programs teacher, one resource teacher (math and science), and the specialized program aide who assists in the resource computer class. The current teacher of the special education computer science class did not attend the meeting but turned in a filled in critique form. No other critique forms were received.

Actual classroom implementation began in week three. Students in the special education computer science class were given a pretest for computer science literacy. (Appendix D:53) Students were also given a database application for computer applications pretest. (Appendix E:58) Special programs students had the literacy test read to them by the teacher aide so that ability to read would not be a factor in the test taking. The computer applications pretest instruction sheet was read and clarified as necessary for all students.

Students reviewed word processing by composing a letter to a friend on the computer. Students took lecture notes on select terms in the area of history of computers.

The lecture/note taking process was unsatisfactory. Students had no concept of outlining even when topic categories are stressed. A number of students were unable to physically write at a pace satisfactory for getting the key terms.

Week Four

Students continued word processing by making their own list of ten items to be purchased at the supermarket. They had access to grocery ads collected over the past several weeks.

Lecture covered data input devices. Samples such as bar codes, ATM cards, checks, and keyboard were shown.

Modifications to the lecture and note taking process were made in week four. Students were given a preprinted outline of topics to take notes on. (Appendix H:67) This was handed in at the end of the period. Students who had taken notes to the best of their ability were given a photocopy of the teachers notes along with their own copy the next class day.

An oral review of computer history terms and concepts was conducted.

Week Five

Students continued with word processing by composing and then word processing a letter to the principal giving their opinion of and suggestions for improving the attendance policy. Students who completed acceptable letters turned them in to the principal.

Student's lecture centered around how computers process data, types of computer code, fields, and records. Students did much better taking notes and learning terminology using the outline guide.

A review of history of computers and input devices was done using team competition. Teams were selected by the instructor to be balanced for abilities.

Week Six

Students wrote a paragraph on a topic of their choice. They word processed their writing and, with help, edited the compositions for grammar and used the spell check function. Students were allowed to turn these into the appropriate English teachers for credit.

The lecture topic and discussion for the week concerned data output and uses of data output. Students examined samples of printed output for the different qualities of printers available.

Again, students reviewed concepts for history of computers, input devices, and how computers process data using a team competition.

Week Seven

Students were reintroduced to databases, fields, and records. Students began gathering data to construct their own database. Most chose to do a list of friends with addresses and phone numbers.

Lecture involved a discussion of the uses of computers in today's world. This included the topics of accounting, inventory, sales, word processing, spreadsheets, database, and graphics.

Members of the curriculum critique committee met to discuss the progress made in achieving the activities set out for this practicum project. It was noted that all activities had been accomplished to this point. The special program teacher and the teacher's aide that assist in the special education computer class observed that the students were on task and accomplishing more hands on tasks. The committee agreed to note at this time that 7 of the 9 specialized program students have or will be attending a special off-campus program for three weeks. They will be missing 3 weeks of presentations and activities that they may not catch up on which may influence the outcome of the objectives being met for this practicum project. No modifications were suggested to address this issue.

Week Eight

Students finished creating and entering data into their personal database. Students then selected a field to meet a condition. The records were printed that met the selected condition.

Student lecture and discussion continued for computers in the world today. Areas addressed were graphics, telecommunications, and product testing. Students reviewed all terminology and concepts previously covered. Students competed in 3 teams. Teams were allowed to use their notes for the first part of the competition. The second half of the competition was done without notes.

Week Nine

Students were taught the concept of problem solving and algorithms in computer programming. They learned how PRINT and END statements are used in BASIC programming language. Students were introduced to accessing RUN from the menu bar. The four math operation symbols and the use of quotation marks were demonstrated. Students were given an opportunity to practice with paper and pencil and corrections were done on the samples as a group in class.

BEST COPY AVAILABLE

Students then entered sample programs and ran them to see how the commands worked. Students were also given a program to run that would generate a syntax error to observe what happens. Trouble shooting syntax errors was discussed and practiced.

Lecture covered the newest and future uses of computers such as car engine efficiency, anti-lock brakes, suspension, and maps; computers in factories such as robots and CAD/CAM; computers on board aircraft and air traffic control; and computers in medicine such as computer imaging and SMART cards.

Week Ten

BASIC programming language was continued with students writing their own short programs to da a math calculation with addition of REM statements. Students learned to access the LIST command from the menu bar.

Lecture continued on computers at work including digitized phone messages, auto dialing, instant tellers, banks, law enforcement, sports, space, navigation, and school. Students practiced reviewing terms learned in this practicum using team competition both with and with out notes.

Week Eleven

Students continued in the BASIC programming language by learning CLS the command to clear the screen. Students were asked to create a program to print a square using the plus (+) symbol. This proved quite challenging to them because they had difficulty thinking in terms of what they would need to print line per line.

Further lecture was dropped at this point. Review was conducted on all terms and concepts taught in this practicum. The five seniors remaining in the class took the literacy posttest and the application posttest as this was their last week.

Week Twelve

Students reviewed concepts and terms in the history of computers, input/output devices, processing data, types of computers, uses of output, computers in the world today, and computer use in the workplace. A study guide (Appendix H:67) was provided, and students reviewed from this guide. The remaining seven students took the posttest in computer literacy (Appendix F:60) and computer application. (Appendix G:65)

CHAPTER IV

Results

During the first three weeks of the practicum a curriculum was developed for the special education computer science class. The curriculum followed the format that the school district uses for special education curriculum with topics, goals, objectives, and suggested methods and materials.

A committee of six administrators and staff members met during the third week of the practicum to review the proposed curriculum. On the committee was the special education administrator for the school site who is in charge of evaluating and reviewing the special education programs and classes. The special education facilitator is the person, who works with the counselors to determine which students may need the services of the special education computer science class instead of a regular class, was also on the committee. A special program teacher and the special program teacher aide helped evaluate the curriculum. They had both assisted special program students in the special education computer science class and helped resource students as time permitted in the last two years. They are aware of the needs of both special programs and resource students in the computer science class. The current teacher of the special education computer science class, who had taught this class for the last two years and was working on a master's degree in computer science, helped evaluate the curriculum. The special education teacher for the resource math and science classes reviewed the curriculum.

The evaluation committee used the Evaluation of Curriculum for Special Education Computer Science Class Critique form (Appendix C:49) developed by the author to review the curriculum. The form contained seven questions about whether the curriculum was viable to increase student's knowledge of computer applications and literacy; addressed the necessary areas of curriculum; gave appropriate emphasis to each area; addressed special education students strengths and weaknesses; provided introductory level job skills; provided support to improve academic performance; and was understandable. Reviewers chose a one to seven rating on a Likert scale to rate each area with one being least positive or no and seven being most positive or yes. Room was provided for additional comments.

Average ratings on each question on the Evaluation of Curriculum for Special Education Computer Science

Class Critique ranged from 6.7 to 7.0 as shown on the Summary of Reviewer Ratings Chart. (Table 3) The criteria for success on objective one of this practicum to have and acceptance level of 90 percent for the proposed curriculum for the special education computer science class. As seen in Table 3, the acceptance level was 98 percent.

Table 3

Summary of Reviewers Critique of Curriculum

Reviewer	Scores							
	Question							
	1	2	3	4	5	6	7	
A	7	6	7	7	7	6	7	
B	7	7	7	7	7	7	6	
C	7	7	7	7	7	7	7	
D	7	7	7	6	7	7	6	
E	7	7	7	7	7	7	7	
F	7	7	7	7	7	7	7	
Total	7	6.8	7	6.8	7	6.8	6.7	
Total approval for questions								48.1
Average approval for questions								6.87
Percent average approval								98%

Objectives two and three dealt with the students in the special computer science class achieving a 50 percent increase in computer literacy knowledge and a 50 percent increase in computer applications performance as measured by an author developed pretest and posttest after selected portions of the proposed curriculum were implemented for ten weeks. In the results of the pretests and posttests a number of factors affecting the data must be looked at. The project began with a class containing nine special programs students and seven resource class students. Before the posttests were administered at the end of implementation,two special programs students and one resource student had left the the class and could not be tested. Additionally,one resource student did not show up to take the literacy posttest and one resource student did not take either the literacy or the application posttests. The special programs teacher and aide that assist students in the special education computer science class did extra review with the special programs students outside of the computer class period which affects their scores. Seven of the nine special programs students were gone from the class for a period of three weeks to attend a special program off campus. These students were provided with copies of the lecture notes they had missed and reviewed them both with the class and with their special programs teachers. Special programs students had both the pretest and posttest for computer literacy read to them by the teacher aide as most of them are very low readers. This is consistent with the way tests have previously been done with them and is also part of the modifications for test taking as written in their individual education plan. All students had the instruction sheet for the computer application pretest and posttest read to them and clarified.

TABLE 4

Pretest and Posttest Results for Computer Literacy for Students in the Special Education Computer Science Class

Student	Literacy Pretest	Literacy Posttest	Percent Increase
A	-	-	0
B	1	-	0
C	7	51	628
D	27	56	107
E	5	56	1020
F	5	38	600
G	1	50	4900
H	1	7	600
I	4	9	125
J	0	-	0
K	8	44	450
L	6	-	0
M	19	47	147
N	5	18	260
O	4	-	0
P	4	32	700

The results for each student are reported in Table 4, Pretest and Posttest Results for Computer Literacy for Students in the Special Education Computer Science Class. The table shows that the students who were in the class at the time of posttesting and who showed up to take the test all achieved increases of over 50 percent in computer literacy which was the minimum criteria to meet objective two for this practicum of increasing computer literacy by 50 percent.

Computer application was evaluated on the basis of could the student produce a finished product that met the criteria for the assignment. No credit was given for partial assignments on either the pretest or the posttest for computer applications. No students were able to complete the pretest assignment for computer applications as shown by Table 5, Pretest and Posttest Results for Computer Applications for Students in the Special Education Computer Science Class.

All students, who were still in the class and who took the posttest for computer applications, were able to meet the criteria of a completed assignment giving them an increase in computer application knowledge of over 50 percent which was the criteria to meet objective three of increasing computer application knowledge by 50 percent.

Table 5

Pretest and Posttest Results for Computer Applications for Students in the Special Education Computer Science Class

Student	Application Pretest	Application Posttest	Percent Increase
A	0	-	0
B	0	-	0
C	0	1	100
D	0	1	100
E	0	1	100
F	0	1	100
G	0	1	100
H	0	1	100
I	0	1	100
J	0	-	0
K	0	1	100
L	0	1	100
M	0	1	100
N	0	1	100
O	0	-	0
P	0	1	100

- did not take test

While all students met the objectives of increasing their computer literacy skills this does not mean that every student met what would be the criteria for passing the special education computer science class as some of the students were quite low at the beginning of this practicum. Computer application skills are more easily acquired probably due to the more concrete and hands on nature of the tasks.

CHAPTER V

Recommendations

The development and implementation of this project to design a curriculum for a special education computer science class could be continued and suggests other areas for investigation. The staff recommended other areas of curriculum be developed in the realm of life skills as the software is procured for theses activities. Successful implementation of a computer science curriculum is affected and influenced somewhat by the type of software used. Selection of software for curriculum is an important ancillary area for exploration.

Several committee members, who evaluated the proposed curriculum (Appendix I:74), would like to see the proposed curriculum reevaluated over the next two school years as innovations in methods and materials are attempted. Methods and materials for teaching are impacted by the available software and the configuration of the computer lab. Computers may be set in rows or be spaced along the walls around the room. Desk areas without computers on them may or may not be available for lecture or instruction that does not directly involve the use of the computer.

Further work and refinement will be done on the developed curriculum for the computer science special education program. The curriculum may then be submitted to the school district for consideration for inclusion in the curriculum guide for special education as the recommended curriculum for the computer science class. The author will assist other teachers with incorporating computers and computer science curriculum into their content area classes. Training or in-service may be conducted for staff at this or other sites on the development and use of the curriculum, methods, and materials presented in this practicum project.

REFERENCE LIST

Boyce, Jeanann S., et al. "Action Research in Business Education." Business Education Forum, February 1988, pp. 23-29.

Clark County School District, Department of Curriculum and Instruction. "Secondary Education Curriculum Guide." (Clark County School District Publication No. 7684-062000.) Nevada,1981.

Clark County School District, Department of Curriculum and Instruction. "Senior High 9-12 Special Education Curriculum." (Clark County School District Publication No. 7684-084000.) Nevada,1980.

Florida State University, Tallahassee. Center for Instructional Development and Services. "Microcomputer Programs for Business Education Occupations. A Bibliography." ERIC Clearinghouse on Handicapped and Gifted Children , 1988, ERIC ED 809 241.

Hebert, Bobbie M., and Jane Y. Murdock. "Comparing Three Computer-Aided Output Modes to Teach Vocabulary Words to Students With Learning Disabilities." Learning Disabilities Research and Practice, Fall, 1994, pp. 136-141.

Hunt-Berg, Mary, and Joan L. Rankin. "Ponder the Possibilities: Computer Supported Writing for Struggling Writers." Learning Disabilities Research and Practice ,Fall 1994, pp. 169-178.

Kuznetsov, E. I., "A New Type of Specialist Is Needed." Soviet Education. March 1991, pp. 15-23.

Larsen, Steen. "What is "Quality" in the Use of Technology for Children With Learning Disabilities?" Learning Disability Quarterly, Spring 1995, pp. 118-129.

Merritt, Susan et al, "September 1992 Draft ACM Model High School Computer Science Curriculum." Photocopy, n.d.

Meyers, Aura F., "Access and Meaning: The Keys to Effective Computer Use by Children with Language Disabilities." Journal of Special Education Technology, Spring 1994, pp. 257-273.

Mississippi State Department of Education, Jackson. "Standardized Curriculum for Business Technology." ERIC Clearinghouse on Handicapped and Gifted Children, 1988, ERIC ED 344 379.

Moursund, David. "Problem-Solving Models for Computer Literacy: Getting Smarter at Solving Problems. Teacher Lesson Plans." ERIC Clearinghouse on Handicapped and Gifted Children, 1993, ERIC ED 367 287.

New York City Board of Education, Brooklyn, N.Y. "LOGO K-12." ERIC Clearinghouse on Handicapped and Gifted Children, 1986, ERIC ED 318 443.

Patton, Jan, and Darlena Murray. "Business Computer Applications I. Curriculum Guide [and] Simulation [and] Test Bank." ERIC Clearinghouse on Handicapped and Gifted Children, 1991, ERIC ED 350 482.

Prasad, B.S. "Constraints of Expanding Computer Education: The Case of the Fiji Islands." ERIC Clearinghouse on Handicapped and Gifted Children, 1991, ERIC ED 353 125.

Raskind, Marshall H., Kenneth L. Herman, and Joseph K. Torgesen. "Technology for Persons With Learning Disabilities: Report on an International Symposium." Learning Disabilities Quarterly, Spring 1995, pp. 175-183.

Warger, Cynthia L., and Bluma B. Weiner. "Secondary Special Education: A Guide to Promising Public Programs." ERIC Clearinghouse on Handicapped and Gifted Children, 1987, ERIC ED 291 207.

APPENDICES

APPENDIX A

NEEDS ASSESSMENT SURVEY

Needs Assessment Survey

1) Do you see a need in the special education department for a standardized curriculum for a data processing class? ___ yes ___ no

2) Would special education student's academic skills be enhanced by a data processing curriculum?
___ yes ___ no

3) Would special education student's potential job skills be enhanced by a data processing curriculum?
___ yes ___ no

4) What data processing skills would the students you work with benefit from that you would like to see included in the curriculum?

5) What other skills do your students need that you would like to see addressed in a data processing curriculum?

APPENDIX B

STRUCTURED INTERVIEW QUESTIONS

Structured Interview Questions

1) Do you see a need in the special education department for a standardized curriculum for the data processing class?

2) Would special education student's academic skills be enhanced by a data processing curriculum?

3) Would special education student's potential job skills be enhanced by a data processing curriculum?

4) What skills do you think should be taught in a data processing class for special populations?

5) What other issues should be considered in developing a data processing curriculum?

APPENDIX C

EVALUATION OF CURRICULUM FOR SPECIAL EDUCATION COMPUTER SCIENCE CLASS CRITIQUE FORM

EVALUATION OF CURRICULUM
FOR SPECIAL EDUCATION
COMPUTER SCIENCE CLASS
CRITIQUE FORM

Circle a number from one to seven with one being very little or no and seven being very much or yes.

1. Does the proposed computer science curriculum for the special education computer science class represent a viable plan to increase special education student's computer literacy and computer application knowledge?

   1 2 3 4 5 6 7

2. Does the proposed curriculum address all of the areas of a computer science curriculum that you feel need to be addressed in the special education computer science class? If no, what topics/areas should be added or deleted?

   1 2 3 4 5 6 7

3. Does the proposed curriculum for the special education computer science class give appropriate emphasis to each topic to be addressed? If no, suggest changes.

   1 2 3 4 5 6 7

4. Does the proposed curriculum address the deficits and strengths of the students typically found in the special education computer science program? If no, what changes would you propose?

   1 2 3 4 5 6 7

5. Does the proposed curriculum address introductory skills that special education students might need to be employable in a job requiring basic computer skills? If not, what should be added/deleted?

   1 2 3 4 5 6 7

6. Does the proposed curriculum provide special education students with skills and techniques to be used to supplement or improve performance in other classes? If no, what would you add or delete?

   1 2 3 4 5 6 7

7. Is the curriculum easy to understand and follow? If not, please identify and make suggestions to improve parts that are unclear.

1 2 3 4 5 6 7

APPENDIX D

COMPUTER LITERACY PRETEST

COMPUTER LITERACY
PRETEST

NAME:________________________________

A Matching

Match the letter of the definition to the term. (1 pt. each)

1. ____ WYSIWYG
2. ____ binary code
3. ____ bit
4. ____ byte
5. ____ manual
6. ____ data
7. ____ processing
8. ____ information
9. ____ alphabetic
10. ____ numeric
11. ____ daisy wheel, dot matrix, & laser
12. ____ micro computer
13. ____ text processing
14. ____ data processing
15. ____ baud
16. ____ chat mode
17. ____ ROM
18. ____ RAM
19. ____ LAN
20. ____ ASCII
21. ____ field
22. ____ record

A. single switch that can be on or off
B. facts
C. number system using 0 and 1
D. What you see is what you get
E. facts that have been handled and are now in a useful form
F. series of bits, stores number or letter
G. by hand
H. working with or handling facts
I. handling numbers such as inventory
J. A, B, C, ...
K. same as personal computer
L. 1, 2, 3, ...
M. handling letters and reports
N. types of printers
O. read only memory
P. random access memory
Q. Code agreed upon and used in computer programs
R. item of data
S. bits per second
T. local area network
U. set of related fields
V. communicate directly with another person using a computer

B. Multiple choice:

Write the letter of the best answer by the number. (1 pt. each)

___23. The parts of the computer processing unit are called___.

A. screen, keyboard, printer
B. arithmetic/ logic, control, primary storage
C. mouse, disk, screen
D. scanner, magnetic tape, information center

___24. Computers store information using binary code. Each bit is tested to see if it is ___

A. up/down
B. in/out
C. on/off
D. None of the above

___25. A byte is made up of ___ bits.

A. 1
B. 4
C. 6
D. 8

___26. The two types of computers are___

A. digital and analog
B. IBM and Apple
C. Laser disk and floppy disk
D. fast and slow

___27. An analog computer processes data by ___

A. adding
B. counting
C. multiplying
D. measuring

___28. A digital computer processes data by ___

A. adding
B. dividing
C. measuring
D. counting

___29. The two types of data computers handle are ____

A.alphabetic/numeric
B.useful/useless
C.true/false
D.none of the above

____30. Output can be used to ___
A. send a bill
B. store data
C. send a check
D. both A and C
E. both A and B

____31. You need a computer, modem, software, and a telephone line for___

A. data processing
B. word processing
C. telecommunications
D. spreadsheets

____32.The newest device for storing extremely large amounts of information such as an encyclopedia is a ___

A. video machine
B. magnetic tape
C. floppy disks
D. CD-ROM disk

____33.A LAN ___

A. Allows people in the same office to communicate with each other easily
B. allows people in an office to type letters more rapidly
C. allows people to work at home
D. allows two people to work at the same computer

C. Short Essay.

Write brief answers to the following questions.

1. List five output devices. (5 pts.)

____

____

____

____

____

2. Give two examples of analog computers. (2 pts.)

____

____

3. List the three steps in the data processing cycle. (3 pts.)

____

____

____

4. List five input devices. (5 pts.)

____

____

____

____

____

5. List five uses of microcomputers. (5 pts.)

____

____

____

____

____

6. List five positive affects computers have on your life.(5 pts.)

____

____

____

____

____

APPENDIX E

COMPUTER APPLICATIONS PRETEST

COMPUTER APPLICATIONS
PRETEST

Background: You are creating a list of friends you have sent Christmas cards to. You are going to store that list in the computer along with whether on not you received a card from them.

1. Create the following database using the categories and the data given. Save the assignment as "computer applications pretest".

   Categories : Name, Address, City, State, card(Y/N)

   John & Mary Tate
   123 Sand Ct.
   Las Vegas, NV 89104
   Card received

   Sally Green
   136 N. 4 St.
   Salt Lake City, UT 79804
   Card received

   Sid Jones
   7447 Ranger Wy.
   Glendale, AZ 85321
   No Card received

   Greg & Jenny Allen
   2379 S. Fork Pl.
   Las Vegas, NV 89110
   Card received

   Joe & Sue Abba
   1247 Pebble St.
   New York, NY 00657
   No card received

2. Sort for the field cards with "yes" (Y). Select name, address, city, state, and zip code for those records.

3. Print the fields and records requested.

APPENDIX F

COMPUTER LITERACY POSTTEST

COMPUTER LITERACY
POSTTEST

NAME:______________________________

A) Matching

Match the letter of the definition to the term. (1 pt. each)

1. ___ byte
2. ___ binary code
3. ___ bit
4. ___ text processing
5. ___ manual
6. ___ alphabetic
7. ___ processing
8. ___ information
9. ___ WYSIWYG
10. ___ numeric
11. ___ daisy wheel, dot matrix, & laser
12. ___ micro computer
13. ___ baud
14. ___ data processing
15. ___ data
16. ___ chat mode
17. ___ record
18. ___ RAM
19. ___ LAN
20. ___ ASCII
21. ___ field
22. ___ ROM

A. single switch that can be on or off

B. facts

C. number system using 0 and 1

D. What you see is what you get

E. facts that have been handled and are now in a useful form

F. series of bits, stores number or letter

G. by hand

H. working with or handling facts

I. handling numbers such as inventory

J. A, B, C, ...

K. same as personal computer

L. 1, 2, 3, ...

M. handling letters and reports

N. types of printers

O. read only memory

P. random access memory

Q. Code agreed upon and used in computer programs

R. item of data

S. bits per second

T. local area network

U. set of related fields

V. communicate directly with another person using a computer

B) Multiple choice:

Write the letter of the best answer by the number. (1 pt. each)

____23. The parts of the computer processing unit are called___.

A. screen, keyboard, printer
B. arithmetic/ logic, control, primary storage
C. mouse, disk, screen
D. scanner, magnetic tape, information center

____24. The two types of computers are___

A. digital and analog
B. IBM and Apple
C. Laser disk and floppy disk
D. fast and slow

____25. An analog computer processes data by ___

A. adding
B. counting
C. multiplying
D. measuring

____26. Output can be used to ___
A. send a bill
B. store data
C. send a check
D. both A and C
E. both A and B

____27. You need a computer, modem, software, and a telephone line for___

A. data processing
B. word processing
C. telecommunications
D. spreadsheets

____28. Computers store information using binary code. Each bit is tested to see if it is ___

A. up/down
B. in/out
C. on/off
D. None of the above

____29. A byte is made up of ___ bits.

A. 1
B. 4
C. 6
D. 8

____30.The newest device for storing extremely large amounts of information such as an encyclopedia is a ___

A. video machine
B. magnetic tape
C. floppy disks
D. CD-ROM disk

____31.A LAN ___

A. Allows people in the same office to communicate with each other easily
B. allows people in an office to type letters more rapidly
C. allows people to work at home
D. allows two people to work at the same computer

____32. A digital computer processes data by ___

A. adding
B. dividing
C. measuring
D. counting

____33. The two types of data computers handle are ____

A.alphabetic/numeric
B.useful/useless
C.true/false
D.none of the above

C) Short Essay.

Write brief answers to the following questions.

1. List five uses of microcomputers. (5 pts.)

____

____

____

____

____

2. Give two examples of analog computers. (2 pts.)

____

____

3. List the three steps in the data processing cycle. (3 pts.)

____

____

____

4. List five input devices. (5 pts.)

____

____

____

____

____

5. List five output devices. (5 pts.)

____

____

____

____

____

6. List five positive affects computers have on your life.(5 pt.)

____

____

____

____

____

APPENDIX G

COMPUTER APPLICATIONS POSTTEST

COMPUTER APPLICATIONS
POSTTEST

Background: You are getting married. Invitations have been sent. You need to know how much food to prepare for the reception. Some guests have not responded to the invitations and you will need to call them to see if they are coming.

1. Create a database with the following categories and data.

   Categories: Last name, first name, address, city, state, zip code, telephone, RSVP.

   James & Sue Tower
   1235 N. 71 St.
   Phoenix, AZ 85342
   602-555-1234
   No RSVP

   Bill & Tracy Smith
   475 Box Wy.
   Fargo, ND 65321
   407-555-1789
   No RSVP

   Sam & Felicia Judge
   2223 N. Beach
   Oceanside, CA 95432
   909-555-6492
   Yes RSVP

   Frank & Toni Pace
   7654 Macon Rd.
   Powertown, GA 54231
   574-555-4973
   No RSVP

   Joe & Mary Southy
   4765 Half Moon St.
   Las Vegas, NV 89107
   702-555-4737
   Yes RSVP

2. Sort for "No" (N) in RSVP field.

3. Print name and phone number field for all those who have not responded to the wedding invitation.

APPENDIX H

SAMPLE OUTLINE AND STUDY GUIDE

DATA INPUT

DATA BEGINS:

DATA INPUT:

A. Direct Data Input

B. Stored Data

C. Input Media

- Magnetic tape

- Magnetic disk

- magnetic strips

- MICR

- Touch screen

- OCR

KINDS OF DATA

STUDY GUIDE
SEMESTER EXAM
SPRING 1996
COMPUTER SCIENCE SPECIAL

DEFINE THESE TERMS:

1) Manual

2) bit

3) byte

4) binary code

5) processing

6) data

7) data processing

8) text processing

9) information

10) alphabetic

11) numeric

12) micro computer

13) daisy wheel,dot matrix,laser

14) ASCII

15) WYSIWIG

16) RAM

17) ROM

18) field

19) record

20) baud

21) LAN

22) chat mode

23) three parts of CPU

24) two types of computers

25) analog computers process by ??

26) digital computers process by ??

27) telecommunication requires 4 things

28) a bill and a check are examples of ??

29) CD ROM

30) Name the two types of data.

31) Give 5 uses of microcomputers.

32) Give 2 examples of analog computers.

33) List three steps in the data processing cycle.

34) Name 5 input devices.

35) Name 5 output devices.

36) List 5 positive affects computers have on your life.

APPENDIX I

PROPOSED CURRICULUM
FOR
SPECIAL EDUCATION COMPUTER
SCIENCE CLASS

Special Education Computer Applications

Course Scope

This one-semester course is designed to familiarize students with using a personal computer and selected software as a tool. The computer applications course will enable students to to begin using a computer to assist them with activities in the disciplines of English, social science, science, and mathematics. The course will provide fundamental vocabulary, general knowledge of computers, computer history and development, and introduce career opportunities. Keyboarding, spreadsheets, database, word processing, and
BASIC programming will be introduced. This course will fill the one-half computer credit required for graduation.

Special Education Computer Applications

Goals and Objectives	Methodology
History of Computers	
1.0 Student will describe background development of computers.	Students will be given a study sheet with terminology on it to take notes on.
1.1 Student will define data processing.	
1.2 Student will identify uses of data records.	Match data record need with type of business.
1.3 Students will be able to tell the difference between manual and electronic data processing.	
1.4 Students will name five places computers are used.	
1.5 Students will be able to trace the steps in improved data handling.	Students given: the terms records, alphabetizing, punch cards, vacuum tubes, and silicon chips will be able to put them in order of earliest to latest.
Microprocessor	
2.0 Student will identify microprocessor's parts and their purposes.	Have a microprocessor and accessories available to demonstrate with.
2.1 Students will identify the three parts of a computer system: input device, output device, and central processor.	Students will be given a study sheet with picture of a personal computer with parts labeled.
2.2 Student will identify the three sections of the central processing unit.	
2.3 Student will tell the purpose of each of the three parts of the central processing unit.	Use concrete comparison such as brain waking from sleep, chalkboard to calculate on, and paper to store work on.
2.4 Student will define ROM.	
2.5 Student will identify the keyboard and mouse as input devices.	Have devices available. Demonstrate input.
2.6 Student will identify the video screen and printer as output devices.	Have devices available and demonstrate.

Microprocessor Components

3.0 Student will identify microprocessor components.

3.1 Student will identify the keyboard.

Have a microprocessor and components available. Provide a word list and picture of microprocessor and components to label.

3.2 Student will identify the computer unit.

3.3 Student will identify the video screen.

3.4 Student will identify the printer.

3.5 Student will identify the disk drive.

3.6 Student will identify a floppy disk.

3.7 Student will identify the mouse.

Care and Use of Disks

4.0 Students will learn to care for and use floppy disks.

4.1 Student will learn to keep disks away from temperature extremes, keep clean, handle gently.

Provide each student with their own disk.

4.2 Student will learn to insert and remove disks.

Demonstrate and then allow students to practice.

Software Operating System

5.0 Students will learn to identify and access the basic parts of the software operating system.

5.1 Student will identify the desk top area of the screen.

Demonstrate and point to areas using a visual aid chart, overhead of the actual screen, or having students grouped around a computer.

5.2 Student will identify and use the menu bar.

5.3 Student will be able to create a file folder.

Use tutorial program

5.4 Student will be able to use the edit, format, font, size, style, and view functions of the software.	Use tutorial program.
5.5 Student will be able to open and close windows and applications.	
5.6 Student will use the vertical scroll bar to scroll.	Allow students to scroll hard drive menu.
5.7 Student will minimize and maximize the screen.	

Keyboarding Skills

6.0 Students will learn keyboarding skills.	Use standard typing program or typing tutor program.
6.1 Students will become familiar with letters and symbols on the home row.	Demonstrate and then allow student practice.
6.2 Student will learn the use of the return key.	Demonstrate and then allow student practice.
6.3 Student will learn to single space and double space with return key and the menu bar short cut.	Demonstrate and then allow student practice.
6.4 Student will learn the use of the shift and caps lock keys.	Demonstrate and then allow student practice.
6.5 Student will learn to produce the following symbols: ? . , ; : ! - /	Use standard typing program or typing tutor software.
6.6 Student will develop skill in keyboarding, speed, and control.	

Data Organization

7.0 Student will recognize how data is organized for use.	
7.1 Student will define fields and records.	Student study sheet for notes.
7.2 Students will relate fields to records.	Give student a set of records with labeled fields and have them find specific pieces of data.
7.3 Student will be able to find information in fields and records.	

7.4 Student will define binary number system and tell how it is related to computers.	Provide a model of a circuit board.
7.5 Student will define bit and byte and tell how they are related to data.	Do a sample representation for a letter.
7.6 Student will identify the two types of characters: alphabetic and numeric.	Student will develop code of on/off switches for a letter of the alphabet.
7.7 Define ASCII code and tell why it was developed.	Students will compare their code to that of others in the class.
7.8 Tell the difference between digital and analog counters.	Student will be given pictures of both digital and analog counters to label and read.
7.9 Identify four places analog counters are used.	

Input Devices and Devices

8.0 Student will be able to identify input devices and media and their uses.	Provide samples or pictures of the input media.
8.1 Student will identify use of magnetic tape and disks.	Student will have vocabulary sheet with terms on it to take notes.
8.2 Student will identify the use magnetic strip.	
8.3 Student will identify the use of magnetic ink (MICR).	
8.4 Student will identify the use of touch screens.	
8.5 Student will identify the use of voice input.	
8.6 Student will identify the use of bar codes.	
8.7 Student will interpret a bar code.	Provide student with bar code and code system.

Output Media and Devices

9.0 Student will identify output media and devices and there uses.	Provide samples or pictures of devices or media.
9.1 Student will define menu computers and where they are found.	Provide student a study sheet to take notes on with terms listed.
9.2 Student will identify letters, memos, invoices, checks, and reports as output media.	
9.3 Student will identify the daisy wheel, dot matrix, and laser as printers.	
9.4 Student will define WYSIWYG (wiz-ee-wig) and its relationship to data output.	
9.5 Student will recognize uses of magnetic files for fast access and back-up storage.	

Word Processing

10.0 Student will understand the uses of and use word processing software.	
10.1 Student will define word processing.	Provide study sheet with terms for notes.
10.2 Student will identify the uses of spell checker, moving text, delete, search and replace, single space, double space, font, print, size, document format and margins.	Demonstrate and allow students time to experiment. They should print the results.
10.3 Student will edit a created document using spell checker, moving text, search and changing font, change print size, change margins and print.	Provide a program with spelling errors and give instructions for other changes.
10.4 Student will use "save" and "save as".	Use as word processing is done.
10.5 Student will "open" a saved document.	Use as word processing is done.
10.6 Student will create, word process a paragraph, and print.	Provide students with a current events topic.

10.7 Student will write, word process a business letter, and print.	Students will create a letter that will actually be sent.
10.8 Student will format a document.	Use on created documents.
10.9 Student will use menu bars for edit format, font, size, and style.	Demonstrate and allow students to experiment with and use in documents.
10.10 Student will be able to change and select justification.	Demonstrate and allow students to experiment.
10.11 Student will Use Bold, underline, and plain text.	Demonstrate and allow students to experiment.

Spreadsheet

11.0 Student will understand and use a spreadsheet software template.

11.1 Student will identify three uses of spreadsheets.	Student will have a study sheet to record notes on.
11.2 Student will enter data and formulas in a spreadsheet template.	Student will use teacher generated template and data to formulate a spreadsheet.
11.3 Student will change data in a previously used spreadsheet.	Student will use previous assignment and make changes as directed by the teacher.

Database

12.0 Student will be able to use and create a database.

12.1 Student will be able to name five uses of a database.	Student will have a study sheet to take notes on.
12.2 Students will search a pre-created database for a field and print out the requested fields.	Teacher will provide a database already entered with identified fields and records.
12.3 Student will enter provided data in a database and sort alphabetically.	Student will be given data and fields to enter.
12.4 Students will develop their own records and fields for a database.	Suggestions: Party invitations and RSVP's, list of friend's addresses and phone numbers, list of companies to apply for jobs and responses.
12.5 Student will create their own database with the developed data.	

12.6 Student will sort their database for a select field, and print their results for selected fields.	

BASIC Programming

13.0 Student will create and run simple programs in the BASIC programming language.	
13.1 Student will analyze a problem, state it in clear terms, and find a solution.	Teacher provides problems and class brainstorms.
13.2 Student will learn symbols used for addition, subtraction, multiplication, and division.	Study sheet with terms to take notes on.
13.3 Student will learn to define and use: PRINT, END, RUN, LIST, CLS, REM.	
13.4 Student will learn to recognize and correct syntax errors.	Have student enter short statements, observe syntax errors, and correct. Have students create their own syntax errors and correct.
13.5 Student will learn the meaning of the term GIGO.	
13.6 Student will write a program to print a message and command results.	Give student a program to enter and then let them create their own.
13.7 Student will write a program to print a geometric shape with remark statements.	Discuss how to view a shape as a set of lines left to right. Discuss how to design statements to get that effect.

Special Education Computer Applications

Second Semester Goals

The following is a list of suggested goals to include for students who elect to remain in the Special Education Computer Application course for the second semester.

- Student will word process assignments for other academic classes.
- Student will develop their own spreadsheet.
- Student will develop their own database.
- Student will develop faster and more accurate keyboarding technique.
- Students will create more complex designs using BASIC programming.
- Student will recognize computer use in our world today such as CAD, CAM, MEDLINE, auto dial, digitized speech,interactive video, on line banking, SMART cards, conferencing, on line services, and CD ROM.
- Student will learn what is involved in choosing your own computer.
- Student will research prices for computers and components.
- Student will investigate and discuss social issues in using computers.

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement (OERI)
Educational Resources Information Center (ERIC)

ERIC®

NOTICE

REPRODUCTION BASIS

☑ This document is covered by a signed "Reproduction Release (Blanket)" form (on file within the ERIC system), encompassing all or classes of documents from its source organization and, therefore, does not require a "Specific Document" Release form.

☐ This document is Federally-funded, or carries its own permission to reproduce, or is otherwise in the public domain and, therefore, may be reproduced by ERIC without a signed Reproduction Release form (either "Specific Document" or "Blanket").

##

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement (OERI)
Educational Resources Information Center (ERIC)

ERIC

REPRODUCTION RELEASE

(Specific Document)

JUL 23 1996

JUL 23 1996

✓ I. DOCUMENT IDENTIFICATION:

Title: Adaptation and Implementation of Curriculum for a High School Special Education Computer Science Class	
Author(s): Jacqueline S. Johnson	
Corporate Source: **Nova Southeastern University**	Publication Date: 7/2/96

✓ II. REPRODUCTION RELEASE:

In order to disseminate as widely as possible timely and significant materials of interest to the educational community, documents announced in the monthly abstract journal of the ERIC system. *Resources in Education* (RIE). are usually made available to users in microfiche, reproduced paper copy. and electronic/optical media. and sold through the ERIC Document Reproduction Service (EDRS) or other ERIC vendors. Credit is given to the source of each document, and, if reproduction release is granted, one of the following notices is affixed to the document.

If permission is granted to reproduce the identified document, please CHECK ONE of the following options and sign the release below.

☒ ◀ **Sample sticker to be affixed to document**

Check here

Permitting microfiche (4"x 6" film), paper copy, electronic, and optical media reproduction

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Sample

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Level 1

Sample sticker to be affixed to document ▶ ☐

or here

Permitting reproduction in other than paper copy.

"PERMISSION TO REPRODUCE THIS MATERIAL IN OTHER THAN PAPER COPY HAS BEEN GRANTED BY

Sample

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Level 2

Sign Here, Please

Documents will be processed as indicated provided reproduction quality permits. If permission to reproduce is granted, but neither box is checked, documents will be processed at Level 1.

✓

"I hereby grant to the Educational Resources Information Center (ERIC) nonexclusive permission to reproduce this document as indicated above. Reproduction from the ERIC microfiche or electronic/optical media by persons other than ERIC employees and its system contractors requires permission from the copyright holder. Exception is made for non-profit reproduction by libraries and other service agencies to satisfy information needs of educators in response to discrete inquiries."

Signature: Jacqueline S Johnson	Position: Teacher
Printed Name: JACQUELINE S. JOHNSON	Organization: Clark County School District
Address: 7117 Dramatic Wy Las Vegas, NV 89130	Telephone Number: (702) 656-1667
	Date: 7/20/96

ERIC
Full Text Provided by ERIC

PREV CON