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Computer assisted instruction: SuccessMaker™ reading and math

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Abstract

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Computer-Assisted Instruction: SuccessMaker™ Reading and Math

This Graduate Research Paper

Submitted to the

Department of Curriculum and Instruction

Division of School Library Media Studies

in Partial Fulfillment of the Requirements for the Degree

Master of Arts

University of Northern Iowa

By
Melissa M. Haley
August, 2001

This Research Paper by: **Melissa M. Haley**

Titled: **Computer-Assisted Instruction**

has been approved as meeting the research paper requirements for the degree of Master of Arts.

August 15, 2001
Date Approved

Barbara Safford
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Rick Traw
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Aug. 21, 2001
Date Approved

Rick Traw
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Abstract

The purpose of this research was to determine whether the *SuccessMaker*™ reading and mathematics program being used at Collins-Maxwell Elementary School, Collins, Iowa, has increased the reading and mathematics scores. The elementary classroom teachers, the reading teacher, elementary principal, and two student key informants were all surveyed to obtain their opinions of the *SuccessMaker*™ program. Survey results indicated that while most of the teachers felt that this program had been beneficial to the students, they did not feel that computer-assisted instruction should replace classroom instruction.

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Chapter One

Introduction

Background

"There was a time when computers were a luxury item for American schools, but that time has clearly passed" (Bangert-Drowns, Kulik, and Kulik, 1985). Technology is everywhere and is especially abundant in our American schools. Teachers and administrators suggest many reasons for bringing technology into schools. Technology supports thinking processes, stimulates motivation and self-esteem, promotes equity, prepares students for the future, supports changes in school structure, and allows for the exploration of its capabilities (http://www.ed.gov/pubs/EdReformStudies/EdTech/reasons.html).

Along with the increase in technology use in schools comes the demand for educational software to support computer-assisted instruction (CAI). Computer software companies have been quick to offer this type of technology to the school market. Computer-assisted instruction (CAI) is also referred to as computer based instruction, computer managed instruction, or integrated learning systems. Computer-assisted instruction has become an integral component of most school curricula as a means for improving students' academic achievement (http://www.ceap.wcu/edu/Houghton/Learner/Look/CAI.html).

"Iowa schoolchildren's test scores in reading and math have dropped for the fourth straight year" according to the Iowa Department of Education (Boshart, 1999). Reading proficiency has steadily dropped from 71.6% in 1993-95 to 68.6% in 1997-99 for fourth grade students and from 73.6% in 1993-95 to 71.3% in 1997-99 among

eighth graders. Eleventh graders have dropped from 79.1% in 1993-95 to 76.4% in 1997-99. Iowa's math proficiency has slipped as well from 74.6% in 1993-95 to 71.5% in 1997-99 for fourth graders, from 76.6% in 1993-95 to 75% in 1997-99 for eighth graders, and from 82.3% in 1993-95 to 81.4% in 1997-99 for eleventh graders (Boshart, 1999). While any wise educator understands that test scores are but one measure of student learning, all educators need to know if computer-assisted instruction does as it claims, raise test scores. This research will investigate the improvement in test scores of one program in one school district in one grade level.

SuccessMaker

In an attempt to increase scores in the areas of reading and mathematics, many schools use computer software as a way to supplement classroom instruction. At Collins-Maxwell Elementary School, Collins, Iowa, the school administration decided in 1997 to purchase the *SuccessMaker* ™ reading and mathematics program from Computer Curriculum Corporation (CCC). It was the hope of the school administration that purchasing this program and integrating it into the regular curriculum would result in improvement in the reading and mathematics scores on the Iowa Tests of Basic Skills. CCC (Computer Curriculum Corporation) is one company that claims to have made great strides in integrating computer software to improve test scores in reading and mathematics. CCC is a leading provider of educational software and services for K-12 schools. Computer Curriculum Corporation's purpose is to deliver measurable achievement in learning for students and learners of all ages. Currently, more than ten million students have used Computer Curriculum Corporation's software. Computer Curriculum Corporation products are installed in

over 16,000 classrooms in all fifty states as well as Canada, the United Kingdom, Japan, Australia, and New Zealand (http://www.ccclearn.com /company/overview/index.html). *SuccessMaker* ™ software serves the entire spectrum of K-12 learners with over fifty courses in reading/language arts, mathematics, science, ESL (English as a Second Language), and Bilingual education. Computer Curriculum Corporation develops and implements standards-based learning solutions combined with tools to continuously and quantifiably measure results against national and state standards. Teachers can assess and adjust curriculum at the district, school, and student level. Computer Curriculum Corporation also offers a Professional Services team to help schools identify and implement "best practices" in computer-based curriculum solutions in the classroom. The *SuccessMaker* ™ program allows customizable enrollment options for individualized instruction, includes assessment tools to measure student, group and class progress, and has printable reports to show administrators and parents how the student is progressing in the program. *SuccessMake*r ™ offers a challenging, engaging, multimedia learning environment that is self-paced, helps to develop critical-thinking skills, and has computer-based tutorials. *SuccessMaker* ™ curriculum is aligned to National and State standards and standardized testing (http://www.ccclearn.com /company/overview/index.html).

Implementation at Collins-Maxwell Elementary School

The *SuccessMaker*™ reading and mathematics software used at Collins-Maxwell Elementary emphasizes the development of basic skills and concepts and promotes the use of higher order thinking skills. Students in grades K-5 partake in

four sessions of *SuccessMaker*™ each week. The students spend approximately nine minutes on reading and nine minutes on mathematics in each session. The reading courses for K-5 students are Reading Readiness (RR), Initial Reading (IR), Reader's Workshop (RW), and Reading Investigations (RI). The mathematics course for all K-5 students is Math Concepts and Skills (MCS). Prior to beginning the *SuccessMaker*™ program each school year, the classroom teacher enters the student's name and current reading and mathematics level. The current reading and mathematics level is taken from the Iowa Grade Equivalent (IGE) on the previous school year's Iowa Tests of Basic Skills. Three months are subtracted from the starting level to accommodate for knowledge that may have been lost during the summer months. Kindergarten students are entered as 0.0, the beginning level of zero years and zero months. The computer software monitors the student's progress and adjusts the levels accordingly so the students can work at their own levels.

Additional Technology Learning Programs

In addition to the *SuccessMaker*™ program, many other companies offer computer-assisted instructional software as well. Accelerated Reader™ and Scholastic Reading Counts™ are two software programs that are widely used in schools. Both of these programs allow students to read at their own pace and level and then test their reading comprehension on each selection. Some other companies that produce mathematics and reading software include Tutorsystems™, Gamco™, Compu-Teach Educational Software™, and Neufeld Learning Systems Inc.™. Each of these software programs takes a slightly different approach to computer-assisted instruction. Tutorsystems™ and Compu-Teach Educational Software™ both offer

software that allows the learner to work at their own pace and level while learning skills in reading, grammar, and mathematics. Gamco™ provides software to improve skills in mathematics, reading, writing, and language arts, while Neufeld Learning Systems Inc.™ offers software strictly to improve mathematics skills.

Description of Problem

Computer software programs are being used to address the need to improve reading and mathematics scores.

Research Questions

1. Has the *SuccessMaker*™ program been effective at improving the reading and mathematics scores of Collins-Maxwell Elementary students, Collins, Iowa?
2. Do teachers perceive that *SuccessMaker*™ has been beneficial to the students?
3. Do administrators perceive that *SuccessMaker*™ has been beneficial to the students?
4. Do students perceive that *SuccessMaker*™ has been beneficial to them?

Purpose Statement

The purpose of this research is to investigate whether the *SuccessMaker* ™ reading and mathematics computer software program being used at Collins-Maxwell Elementary School has increased the reading and mathematics scores.

Definitions

Computer-assisted Instruction (CAI)-Programmed instruction utilizing an electronic computer as the principal medium of instruction. Instructional material is presented

on a terminal under computer control and student responses are processed by the computer. The Facts on File Dictionary of Education. (1988).

Computer Managed Instruction-Use of the computer to select materials, schedule, test, prescribe, and maintain student records. The Facts on File Dictionary of Education. (1988).

Iowa Tests of Basic Skills (ITBS)-General achievement tests for grades three through eight which are widely used in elementary schools for measuring student attainment levels in reading, arithmetic, spelling, language, science and social studies. The Facts on File Dictionary of Education. (1988).

Metropolitan Achievement Tests, Seventh Edition (MAT)-A comprehensive system of norm-referenced and criterion-referenced tests of achievement that is group-administered and measures performance in grades K to 12. Tests are provided in the content areas of reading comprehension, mathematics, language, social studies, and science. The Facts on File Dictionary of Education. (1988).

Stanford Achievement Tests-A norm-referenced and criterion-referenced test that measures skill development in vocabulary, reading comprehension, mathematics, spelling, language, social studies, and science. There are six levels which cover grades one to nine. The Facts on File Dictionary of Education. (1988).

SuccessMaker ™-a reading and mathematics computer software program produced by the Computer Curriculum Corporation (CCC)

Assumptions

The researcher assumes that data are available for the study and that the findings of this research can be presented as a case study.

Limitations

The data collected for this research will come from interviews and surveys of administration and teaching staff at Collins-Maxwell Schools and Iowa Tests of Basic Skills test scores, and the *SuccessMaker* ™ scores. Therefore, the results of this study cannot be generalized. This research is limited to a specific computer-assisted instructional software program and its measured success against standardized test scores. The researcher understands that standardized test scores are but one indicator of student learning.

Significance

Knowing whether computer reading and mathematics software programs increase scores is important for several reasons. First, classroom time is very valuable and needs to be used as effectively and efficiently as possible. Second, most schools, especially those in small rural areas, have limited budgets and need to make purchases that are cost-effective. Third, if scores are not improving with the increase of technology use then alternative approaches must be sought.

Chapter 2

Literature Review

Research on computer-assisted instruction (CAI) explores the impact of CAI on student achievement within different curricular areas, the comprehension differences of CAI versus teacher and/or text instruction, and whether implementation of CAI is effective for all students.

Impact of CAI

Middleton and Murray (1999) examined the relationship between levels of technology implementation in the classroom and standardized test scores in reading and mathematics. They used the *Levels of Technology Implementation Instrument (LoTi)*, developed by Christopher Moersch in 1994, to determine the level of technology being used in fourth and fifth grade classrooms in fifteen schools in a large South Carolina school district. To determine student achievement, they used the *Metropolitan Achievement Tests: Seventh Edition (MAT7).* After administering the *LoTi* to fourth and fifth grade teachers, the researchers categorized the teachers by those who used a high level of technology in their classroom and those who used little or no technology in their classroom. Once the teacher's level of technology implementation was identified, the researchers compared the standardized test scores of the students to determine if there were significant differences between academic achievement of the high level teachers' students and the little or no technology teachers' students. Their findings showed that the level of technology used had a significant effect on the academic achievement of the fifth grade students in mathematics, but not on the fourth grade students. This was true for the reading

academic achievement of the students as well. The fifth grade students showed greater academic achievement as technology usage was higher in their classrooms than in the fourth grade classrooms. Middleton and Murray concluded that technology does have a significant effect on student achievement (109-114).

Another study conducted by Christmann, Badgett, and Lucking (1997), evaluated the effectiveness of CAI on student achievement in various curricular areas. The researchers reviewed over one thousand studies and selected twenty-seven which met their four predetermined criteria for meta-analysis. The criteria included studies that: Were conducted in secondary schools: Included quantitative results: Were of an experimental, quasi-experimental, or correlational research design: and Had sample sizes with a minimum of twenty students in the experimental control groups. The researchers separated the studies into the following categories: significant positive, where the CAI group achieved statistically significantly higher gains than did the group exposed to traditional methods of instruction; significant negative, where the group exposed to traditional methods of instruction achieved statistically significant gains over the group exposed to CAI; and no significant difference, where neither group exposed to CAI or traditional instruction achieved statistically higher gains. The results of the studies showed that CAI appears to be more conducive to academic achievement than does traditional instruction (281-296).

A study conducted by Erdner, Guy, and Bush (1998) also explored the impact of CAI on student achievement. They studied the impact of CAI reading instruction on first grade students for one academic year. Eighty-five first grade students enrolled in two elementary schools in North Central Oklahoma were sampled. The students

were divided into an experimental group and a control group. The students in the control group were taught reading using the traditional classroom method, while the students in the experimental group were taught reading using the traditional classroom method supplemented with CAI. The experimental group students received sixty minutes per week of computer-assisted instruction in reading. Each computer lesson was designed to meet the individual needs of the student. All students were tested at the beginning of the school year using the *CTBS* (*Comprehensive Test of Basic Skills*) and then retested at the end of the school year. When compared at the beginning of the school year, there were no significant differences in reading skills between the control group and experimental group. The study concluded that CAI is a viable supplement to traditional reading instructional practice (369-386).

CAI Versus Teacher/Text

Middleton and Murray (1999), Christmann, Badgett, and Lucking (1997), and Erdner, Guy, and Bush (1998) conducted studies that showed that technology has a significant effect on student achievement, but one may question how students comprehend material when they learn from computer-assisted instruction (CAI) rather than a teacher and/or text environment? Reinking (1988) studied the reading comprehension of students using CAI compared to the traditional teacher and/or text method of reading instruction. Along with previous research, he investigated whether texts presented electronically would affect reader's passage preference, their estimation of their own learning and the time taken to read the text, and whether these factors would contribute to comprehension differences. Thirty-three fifth and sixth grade students read expository passages on a printed page and three passages on the

computer. When reading passages on the computer, students were given four options for assistance and could choose: a less technical version of the passage, definitions of key vocabulary, additional background information, and the main idea of each paragraph in the passage. After reading each passage the students answered six multiple-choice comprehension items. The results of the research showed that comprehension increases when a computer is used to expand reader's options for acquiring information from text or to control their processing of text (484-498).

Another study conducted in a rural southern junior high school showed similar results to Reinking's study. Potter and Small (1998) studied a school of nine hundred junior high school students. The school had a need to improve reading scores and chose to use computer-assisted instruction along with teacher instruction. The language arts classes met for ninety-five minutes each day. During this time, seventy-five minutes were spent in the classroom with the teacher giving instruction in grammar, reading, writing, and literature. Twenty minutes were spent each day using the reading software from Computer Curriculum Corporation (CCC).

Results of the study showed that after two years of teacher and computer-assisted instruction, the students made significant gains in reading, language, and writing as measured by the California Test of Basic Skills and the Stanford Achievement Test (383-387).

CAI Effectiveness

The main purpose for using computer-assisted instruction (CAI) is to increase achievement scores for all students as the instruction is adapted to individual learners (Mevarech, 1993, 451). Research has questioned the effect of CAI on low achievers

versus high achievers. Mevarech set out to examine the differential effects of cooperative and individualized computer-assisted instruction (C-CAI vs. I-CAI) on mathematics achievement, the amount of invested mental effort (AIME), academic recognition, and social acceptance of high and low achieving students. Mevarech studied third grade students from two Israeli public schools. The students drilled and practiced mathematics using the Integrated Instructional System (TOAM), which is the Hebrew acronym of practice and diagnosis with computers. The Israeli Center of Educational Technology based upon the Computer Curriculum Corporation (CCC) System developed the Integrated Instructional System. The Integrated Instructional System covers elementary school mathematics from first through eighth grade and includes the topics of the four basic operations of whole numbers, fractions, and decimals, equations, word problems, weights, and measures. The students Mevarech studied had been using this system since second grade. Using the paper-administered Arithmetic Achievement Test (AAT), developed in 1985 by the Israeli Ministry of Education, and the TOAM assessment procedure, mathematical achievement was assessed. The TOAM procedure was used at the beginning and end of the study to assess students' achievement in mathematics. AIME (Amount of Invested Mental Effort) was assessed at the beginning, middle and end of the study by a short questionnaire. Along with AIME, Interpersonal Relationships were assessed prior to and at the end of the study using the Interpersonal Relationships Assessment Technique (IRAT) developed by Cohen and Schwarzwald, 1982. This scale assessed students' willingness to engage in activities with each classmate.

The research showed that low achievers tended to benefit more in C-CAI settings than in I-CAI settings. In a cooperative-computer-assisted instruction (C-CAI) environment, the groups were small enough so low achievers could receive instant help from their peers, discuss their errors, and try new strategies as suggested by other members of their cooperative group (Mevarech, 1993, 452).

Another study on the effectiveness of CAI was conducted by Saracho (1982). She studied 256 3rd, 4th, 5th, and 6th grade Spanish-speaking migrant children. The students were studied in two groups, 128 students each, with one group receiving CAI to supplement instruction and the second group serving as a control group. The CAI group participated in a program designed by CCC (Computer Curriculum Corporation). All of the students studied were Spanish-speaking migrants with similar socioeconomic backgrounds and similar achievement levels. Data was gathered using the Comprehensive Tests of Basic Skills to measure basic skills in reading, language, and mathematics, a teacher questionnaire to collect demographic information, and the SAI (Student's Attitude Instrument) to survey the students' attitudes toward the CAI program.

Students in the treatment group were introduced to new concepts in the classroom and given examples of the new concepts. After receiving this instruction the students would practice the new concepts on lessons on the computer and the computer would assess their level of understanding and produce a printout for the teacher. The level of difficulty increased with the student's level of comprehension.

The result of the study indicated that the use of CAI as a supplement to regular classroom instruction improved the achievement levels in reading, language

arts, and mathematics. The students who were not exposed to CAI looked more favorably upon it than those who were actually using CAI (201-219).

Summary

Research about computer-assisted instruction (CAI) has shown that it does indeed positively affect reading and mathematics scores. CAI allows students to work at a level and pace which is comfortable to them. When used appropriately, the computer will enhance the existing curriculum by providing and managing the instruction of individual students (Lepper, 1985; Mitzel, 1972; Wang and Sleeman, 1993).

Chapter 3

Methodology

The purpose of this research is to investigate whether the *SuccessMaker* ™ reading and mathematics computer software program being used at Collins-Maxwell Elementary School has increased reading and mathematics scores.

Method of Research

The site of this case study will be Collins-Maxwell Elementary School. Twelve classroom teachers, grades kindergarten through five, a reading teacher, an administrator (the elementary principal), and two key informants (a fourth grade class representative and a fifth grade class representative) will be given surveys regarding the implementation of the *SuccessMaker*™ program.

The case study methodology was selected for this research because a case study has the "ability to deal with a full variety of evidence-documents, artifacts, interviews, and observations" (as cited in Yin, 1994, p. 8). A case study also "...tries to illuminate a decision or set of decisions: why they were taken, how they were implemented, and with what result" (Yin, 1994, p. 12). In a case study, data can be collected from numerous resources including documentation, interviews, direct observation, documentation, and physical artifacts.

A limitation of the case study methodology is that it provides little basis for scientific generalization, but case studies "...are generalizable to theoretical propositions and not to populations or universes" (Yin, 1994, p. 10).

Population

For the purposes of this research, the 2000-2001 fifth grade class at Collins-Maxwell Elementary School will be used. The fifth grade students have been using the *SuccessMaker* ™ program for the past two and a half years and comparing their scores over the two years will show the amount of improvement. Only students who have attended Collins-Maxwell Elementary continuously since the 1998-1999 school year will be included. Special education students will be excluded from the research. as they do not complete the Iowa Tests of Basic Skills.The population consists of twenty-five students, twelve males and thirteen females.

Data Collection

The data for the case study will be collected by using the test results from the Iowa Tests of Basic Skills from the 1999-2000 school year. The Iowa Grade Equivalent (IGE) in reading and mathematics will be recorded for each student, and compared, as will the *SuccessMaker*™ reading and mathematics scores. Data will also be collected for the 1999-2000 school year and the 2000-2001 school year from the scores of the *SuccessMaker*™ program. In addition to this data, surveys will be given to the elementary principal, the reading teacher and the teaching staff, grades kindergarten through five, to obtain their opinions and observations of the implementation of the *SuccessMaker*™ program. The surveys will consist of multiple-choice items as well as some items which will require justification of the response. Since the *SuccessMaker*™ program was implemented in the middle of the school year when the present fifth grade students were in third grade, their end of the year *SuccessMaker*™ scores will be collected from their fourth and fifth grade years

only. The 2000-2001 fifth grade class did not complete the Iowa Tests of Basic Skills for the aforementioned year so only their reading and mathematics scores for the 1998-1999 school year and 1999-2000 school year can be collected. Two key informants will also be interviewed; one representing the fourth grade class and one representing the fifth grade class.

Procedures

Several factors need to be addressed when considering the gathering of data. Only completed Iowa Tests of Basic Skills scores will be evaluated. Scores from students who did not complete all aspects of the test, due to absence, will be excluded from the data set. Students who have been absent from school for five or more days per year during any of the three years studied will be excluded from the data set. School days lost to inclement weather will not be a factor as they are included in the school calendar and are made up as necessary. Student confidentiality will be maintained at all times. Student scores will be assigned a letter. The students' names will not be included in any of the information.

Reading and mathematics scores from the 1999-2000 Iowa Tests of Basic Skills will be collected. Scores for the *SuccessMaker*™ program will be collected from the 1999-2000 and 2000-2001 school years. Cover letters and surveys (Appendices A, B, and C) will be sent to the classroom teachers of grades kindergarten through five as well as to the reading teacher, and Administrator. They will be given two weeks to complete and return the surveys. In addition to the surveys, interviews will be conducted with any teachers who indicate extreme positions on the survey.

Chapter 4

Data Analysis

In order to evaluate the results of the *SuccessMaker*™ program at Collins-Maxwell Elementary School, a comparison of test results was completed. In addition to the comparison of test results, surveys were sent to the twelve classroom teachers of grades kindergarten through fifth, the reading teacher, and the elementary principal. Interviews were conducted with two key informants, a fourth grade class representative and a fifth grade class representative. The comparison of test results, surveys, and interviews were conducted in order to answer the following questions:

1. Has the *SuccessMaker*™ program been effective at improving the reading and mathematics scores?
2. Do teachers, administrators and students perceive that the *SuccessMaker*™ program has been beneficial to learning?

ITBS and *SuccessMaker*™ Results

Tables one through seven show the test results for the students from the Iowa Tests of Basic Skills and the *SuccessMaker*™ program. The third grade *SuccessMaker*™ scores were not available and the students did not take the Iowa Tests of Basic Skills in the fifth grade. Tables six and seven show all of the available reading and mathematics scores for the students from the third grade through the fifth grade. When comparing the reading scores, it shows that nine out of twenty-five students had lower reading scores in the *SuccessMaker*™ program at the end of the fifth grade. Two of the students had growth of almost four grade levels at the end of their fifth grade year. The math scores showed similar results with six students having

lower scores in the *SuccessMaker*™ program at the end of fifth grade. The grade level growth was not as significant in math with three students showing two and a half grade levels of growth and one student showing three grade levels of growth. In all but two instances, the *SuccessMaker*™ scores are higher at fourth grade than the ITBS scores and there is more than half a year of growth.

Table five shows the data paired in an effort to show the improvement or growth of each student. These tables show that while there is some evidence to suggest that the *SuccessMaker*™ program may help to improve the reading scores, the math scores may actually be decreasing with the use of this program. The data and results are not strong enough however, to claim statistical significance about the effectiveness of this program.

Table 1: Iowa Tests of Basic Skills 3rd Grade January 1999

STUDENT	ITBS Reading	ITBS Math
A	2.2	2.5
B	3.1	3.8
C	6.2	4.6
D	2.1	1.2
E	4.4	3.8
F	4.1	3.8
G	4.4	4.2
H	3.8	3.3
I	1.9	1.9
J	5.9	4.3
K	4.6	3.8
L	4.6	3.8
M	2.5	2.1
N	4.9	4.6
O	5.4	4.0
P	5.6	4.9
Q	2.8	2.8
R	4.5	3.2
S	5.8	4.3
T	1.5	1.5
U	3.5	3.4
V	4.4	3.4
W	4.6	3.6
X	3.0	3.8
Y	2.3	1.7
Mean	**3.924**	**3.372**
Median	**3.8**	**2.8**
Mode	**4.5**	**3.8**
Max	**6.2**	**4.9**
Min	**1.5**	**1.2**

Table 2: Iowa Tests of Basic Skills 4th Grade January 2000

STUDENT	ITBS Reading	ITBS Math
A	3.9	2.7
B	3.9	3.3
C	6.4	4.4
D	2.6	2.4
E	3.9	4.4
F	6.7	6.5
G	5.6	7.6
H	4.6	4.0
I	2.8	2.4
J	5.3	6.5
K	5.5	3.6
L	3.5	4.0
M	3.2	3.3
N	6.1	5.7
O	5.1	4.6
P	6.4	6.4
Q	5.1	3.8
R	5.2	4.3
S	6.5	6.6
T	2.3	3.4
U	5.9	5.3
V	4.0	6.4
W	6.7	5.7
X	4.4	5.8
Y	2.3	3.2
Mean	**4.716**	**4.652**
Median	**5.1**	**4.4**
Mode	**6.7**	**7.6**
Max	**6.7**	**7.6**
Min	**2.3**	**2.4**

Table 3: *SuccessMaker*™ 4th Grade May 2000

STUDENT	*SuccessMaker*™ Reading	*SuccessMaker*™ Math
A	3.56	2.71
B	5.53	4.31
C	7.08	4.42
D	3.34	3.21
E	6.43	4.35
F	7.03	4.76
G	5.64	4.76
H	6.58	4.25
I	4.64	3.79
J	6.16	5.45
K	7.25	4.8
L	6.78	4.41
M	5.56	3.86
N	6.18	4.93
O	6.92	4.82
P	6.88	4.84
Q	5.06	4.34
R	6.39	4.23
S	7.07	4.86
T	4.44	3.65
U	5.67	4.71
V	5.24	4.15
W	7.03	5.01
X	4.49	3.9
Y	3.91	3.51

Mean	**5.7944**	**4.3212**
Median	**6.16**	**4.35**
Mode	**7.03**	**4.76**
Max	**7.25**	**5.45**
Min	**3.34**	**2.71**

Table 4: *SuccessMaker*™ 5th Grade May 2001

STUDENT	*SuccessMaker*™ Reading	*SuccessMaker*™ Math
A	4.15	2.41
B	5.68	4.71
C	7.41	5.7
D	3.04	3.71
E	7.49	4.87
F	6.17	5.17
G	7.5	5.82
H	6.13	5.31
I	5.91	4.31
J	6.4	6.18
K	7.35	5.08
L	6.55	4.81
M	6.1	4.29
N	6.08	5.85
O	7.48	6.04
P	6.2	5.84
Q	6.14	5.26
R	6.07	4.9
S	6.17	5.53
T	5.34	4.68
U	7.22	5.11
V	6.74	4.74
W	6.18	6.25
X	4.85	4.39
Y	4.01	4.03
Mean	**6.0944**	**4.9996**
Median	**6.17**	**5.08**
Mode	**6.17**	**N/A**
Max	**7.5**	**6.25**
Min	**3.04**	**2.41**

Table 5: Paired Data 4th Grade ITBS & *SuccessMaker*™

STUDENT	Reading	Math
A	-0.34	0.01
B	1.63	1.01
C	0.68	0.02
D	0.74	0.81
E	2.53	-0.05
F	0.33	-1.74
G	0.04	-2.84
H	1.98	0.25
I	1.84	1.39
J	0.86	-1.05
K	1.75	1.2
L	3.28	0.41
M	2.36	0.56
N	0.08	-0.77
O	1.82	0.22
P	0.48	-1.56
Q	-0.04	0.54
R	1.19	-0.07
S	0.57	-1.74
T	2.14	0.25
U	-0.23	-0.59
V	1.24	-2.25
W	0.33	-0.69
X	0.09	-1.9
Y	1.61	0.31

Mean	**1.0784**	**-0.3308**
Median	**0.86**	**0.01**
Variance	**0.97526355**	**1.1385258**
Max	**3.28**	**1.39**
Min	**-0.34**	**-2.84**

Table 6: All Available Reading Scores 3rd Grade Through 5th Grade

STUDENT	3rd ITBS	4th ITBS	4th SuccessMaker	5th SuccessMaker
A	2.2	3.9	3.56	4.15
B	3.1	3.9	5.53	5.68
C	6.2	6.4	7.08	7.41
D	2.1	2.6	3.34	3.04
E	4.4	3.9	6.43	7.49
F	4.1	6.7	7.03	6.17
G	4.4	5.6	5.64	7.5
H	3.8	4.6	6.58	6.13
I	1.9	2.8	4.64	5.91
J	5.9	5.3	6.16	6.4
K	4.6	5.5	7.25	7.35
L	4.6	3.5	6.78	6.55
M	2.5	3.2	5.56	6.1
N	4.9	6.1	6.18	6.08
O	5.4	5.1	6.92	7.48
P	5.6	6.4	6.88	6.2
Q	2.8	5.1	5.06	6.14
R	4.5	5.2	6.39	6.07
S	5.8	6.5	7.07	6.17
T	1.5	2.3	4.44	5.34
U	3.5	5.9	5.67	7.22
V	4.4	4.0	5.24	6.74
W	4.6	6.7	7.03	6.18
X	3.0	4.4	4.49	4.85
Y	2.3	2.3	3.91	4.01

Table 7: All Available Math Scores 3rd Grade Through 5th Grade

STUDENT	3rd ITBS	4th ITBS	4th SuccessMaker	5th SuccessMaker
A	2.5	2.7	2.71	2.41
B	3.8	3.3	4.31	4.71
C	4.6	4.4	4.42	5.7
D	1.2	2.4	3.21	3.71
E	3.8	4.4	4.35	4.87
F	3.8	6.5	4.76	5.17
G	4.2	7.6	4.76	5.82
H	3.3	4.0	4.25	5.31
I	1.9	2.4	3.79	4.31
J	4.3	6.5	5.45	6.18
K	3.8	3.6	4.8	5.08
L	3.8	4.0	4.41	4.81
M	2.1	3.3	3.86	4.29
N	4.6	5.7	4.93	5.85
O	4.0	4.6	4.82	6.04
P	4.9	6.4	4.84	5.84
Q	2.8	3.8	4.34	5.26
R	3.2	4.3	4.23	4.9
S	4.3	6.6	4.86	5.53
T	1.5	3.4	3.65	4.68
U	3.4	5.3	4.71	5.11
V	3.4	6.4	4.15	4.74
W	3.6	5.7	5.01	6.25
X	3.8	5.8	3.9	4.39
Y	1.7	3.2	3.51	4.03

Classroom Teacher Perceptions

The table below shows the results of the classroom teacher surveys. While all but one teacher felt that the *SuccessMaker*™ program had been beneficial to the students, comments suggested that they do not all feel that CAI (computer-assisted instruction) is a good way for students to learn. Several of the teachers commented that although they felt *SuccessMaker*™ was a good program, it cannot take the place of classroom instruction. Another concern expressed by the teachers was the fact that often in the math portion of the program the students will be working on skills that have not been covered in the classroom thus causing them to become frustrated. This frustration then carries over into the classroom and makes it challenging for the teachers to teach the same math skills to the students. The teachers also expressed their concern about the implementation of the program with only limited initial training. This situation has since been remedied and training sessions are now being conducted at least two times during the school year. The teachers feel this additional training has helped them use the *SuccessMaker*™ program more effectively.

Table 8: Classroom Teacher Survey

	YES	NO	UNDECIDED	TOTALS
Do students enjoy using the SuccesMaker™ program?	8	0	4	12
Has the SuccessMaker™ program been beneficial to the students?	11	0	1	12
Is CAI (computer-assisted instruction) a good way for students to learn?	9	1	2	12

Reading Teacher and Adminstrator Perceptions

The reading teacher and administrator were also surveyed. They both indicated on their surveys that they felt that the *SuccessMaker*™ program had been beneficial to the students and that scores have improved in reading due to the implementation of the program. The reading teacher indicated that the more opportunities a student has to practice reading the more they improve and for some students a computer reading program offers them more practice time as well as more success because they receive immediate feedback and can work at their own level. She did express concern over the fact that when reading skills are learned using a computer program, the student cannot verbalize as they can when reading with a teacher. She also suggested that while all reading skills seem to be covered in the program, the students cannot learn all of the skills that they need to know when they are only using the program for a limited amount of time each week. Both the reading teacher and administrator feel that the students who enjoy the program the most are those who always strive to be successful in their academics.

Student Perceptions

Three questions were asked to the two key informants who were representatives of the fourth and fifth grade classes. They both stated that they think half of the students in their classes enjoy using the *SuccessMaker*™ program and the other half do not because they find it boring. The fifth grade representative commented that the Talented and Gifted program students seem to really like the math portion of the program as it offers them more challenges than that of the classroom. Both stated that the students tend to prefer the math to the reading but get

frustrated when the math becomes too difficult. Neither informant was sure if this program was helping to improve the reading and math scores of their classmates. They both suggested that if the program was not used so frequently that students might enjoy it more.

Chapter 5

Summary, Conclusions, and Recommendations

Summary

The purpose of this research was to investigate whether the *SuccessMaker*™ reading and mathematics program being used at Collins-Maxwell Elementary, Collins, Iowa, increased the reading and mathematics scores. In addition, the research also investigated whether the teachers, administrators, and students felt that this program was beneficial to learning.

Conclusions

The data collected for this research did not show significant improvements in either the reading or mathematics scores of the students. One reason may be the fact that the mathematics portion of the program becomes increasingly more challenging for students and often gives them problems requiring skills which have not been covered in the classroom. This causes the students to become frustrated and lowers their scores when they either do not complete the problem or complete it incorrectly. While the teachers surveyed indicated that they feel the students overall enjoy the program, the key informants reported that their classmates are divided on this issue. They stated that half of the students enjoy the program while the other half do not. They attribute this to the frustration that the students feel when given a problem they cannot solve and to the overuse of the program.

Another question that was posed for this research was the benefit of computer-assisted instruction. The majority of teachers indicated that they feel computer-assisted instruction is a good way for students to learn, but should not replace

classroom instruction. Comments suggested that students like the opportunity to do work on the computers and it gives them a break from the classroom setting.

When the *SuccessMaker*™ program was first implemented into the curriculum, the teachers were given little training and were not fully aware of the capabilities of the program. They are now receiving more training. They still need time to review all of the courses within the program more thoroughly and in particular, the math concepts and skills course. They need to teach the math skills in the classroom prior to the students being asked to use the skills in the *SuccessMaker*™ program. Feedback from the *SuccessMaker*™ trainer suggested that the students did not make a half year of growth using the program during the 2000-2001 school year. This may be attributed to the fact that the teachers have not received proper training in the program and will hopefully be remedied with the new training.

While it is somewhat disappointing to not see significant improvements in the reading and mathematics scores, it must be remembered that standardized tests are only one measure of student learning.

When looking at the results, one may question if the results are worth the cost of the program.

Recommendations for Further Study

Further studies on the benefits of CAI (computer-assisted instruction) may question if the type of CAI used makes a difference in scores. Research could be conducted to compare similar CAI programs to standardized test scores testing the same skills. Another area of research may be the impact of CAI among the genders.

As one of the key informants interviewed suggested that the males in her class are less interested in CAI than the females. Another area for further exploration is student growth with the use of the *SuccessMaker*™ program and without the use of the program. Further studies may also question classroom teachers and other CAI programs that they use and what their results have been. A final research study could be conducted to determine if there is not significant improvement in the scores, then why is money being spent on the *SuccessMaker*™ program? A final study should be done after the students complete the Iowa Tests of Basic Skills in January 2002 as this will be the first real measure of the impact of the *SuccessMaker*™ program. This study should also be repeated when the students are in eighth grade as that will be their sixth year using the program.

Computer-assisted instruction may not be the best alternative for all students, but with the demand to continue to incorporate technology into the curriculum, teachers will most likely find themselves being encouraged to use more of this type of instruction in their lessons.

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Collins-Maxwell Elementary Principal
Street or PO Address
Community Name and Zip Code

Dear_____:

I am conducting research on computer-assisted instruction and the impact it has on student scores in mathematics and reading. I am focusing on the SuccessMaker® program in particular. I would greatly appreciate your response to the enclosed survey. The information collected from the surveys will be used for my University of Northern Iowa Master's research paper on computer-assisted instruction. All information that you supply will be strictly confidential so please feel free to be honest with your responses.

Please take a moment to answer the survey questions as completely as possible. When you have finished the survey, please return it in the enclosed envelope by (date to be indicated later).

If you should have any questions about this survey, please feel free to contact me.

Enclosed you will find the survey and a stamped self-addressed envelope. Thank you for your time and effort and enjoy the rest of your summer.

Sincerely,

Melissa Haley
408 Woodlawn Street
Maxwell, IA 50161
515-387-8947

SuccessMaker® Administrator Survey

1. In your opinion, how do you think the teachers feel about the implementation of the SuccessMaker® program?

2. How do you think the students feel about the SuccessMaker® program?

3. What is your opinion of the SuccessMaker® program since its implementation into the curriculum?

4. Do you think CAI (computer-assisted instruction) such as the SuccessMaker® program is a good way for students to learn? Why or why not?

Date

Collins-Maxwell Elementary Teacher
Street or PO Address
Community Name and Zip Code

Dear_____:

I am conducting research on computer-assisted instruction and the impact it has on student scores in mathematics and reading. I am focusing on the SuccessMaker® program in particular. I would greatly appreciate your response to the enclosed survey. The information collected from the surveys will be used for my University of Northern Iowa Master's research paper on computer-assisted instruction. All information that you supply will be strictly confidential so please feel free to be honest with your responses.

Please take a moment to answer the survey questions as completely as possible. When you have finished the survey, please return it in the enclosed envelope by (date to be indicated later).

If you should have any questions about this survey, please feel free to contact me.

Enclosed you will find the survey and a stamped self-addressed envelope. Thank you for your time and effort and enjoy the rest of your summer.

Sincerely,

Melissa Haley
408 Woodlawn Street
Maxwell, IA 50161
515-387-8947

SuccessMaker® Classroom Teacher Survey

1. How many years have you used the SuccessMaker® program with your students?

   1 2 3

2. What grade level do you teach?

   K 1 2 3 4 5

3. Do you think the implementation of SuccessMaker® into the curriculum has been beneficial to the students?

   YES NO UNDECIDED

   Why or why not?

4. Do you feel that the students enjoy using the SuccessMaker® program?

   YES NO UNDECIDED

5. What do you like about the SuccessMaker® program?

   What do you dislike about the SuccessMaker® program?

6. Do you think CAI (computer-assisted instruction) such as the SuccessMaker® program is a good way for students to learn? Why or why not?

Date

Collins-Maxwell Elementary Reading Teacher
Street or PO Address
Community Name and Zip Code

Dear_____:

I am conducting research on computer-assisted instruction and the impact it has on student scores in mathematics and reading. I am focusing on the SuccessMaker® program in particular. I would greatly appreciate your response to the enclosed survey. The information collected from the surveys will be used for my University of Northern Iowa Master's research paper on computer-assisted instruction. All information that you supply will be strictly confidential so please feel free to be honest with your responses.

Please take a moment to answer the survey questions as completely as possible. When you have finished the survey, please return it in the enclosed envelope by (date to be indicated later).

If you should have any questions about this survey, please feel free to contact me.

Enclosed you will find the survey and a stamped self-addressed envelope. Thank you for your time and effort and enjoy the rest of your summer.

Sincerely,

Melissa Haley
408 Woodlawn Street
Maxwell, IA 50161
515-387-8947

SuccessMaker® Survey
Collins-Maxwell Elementary Reading Teacher

1. Do you think the implementation of the SuccessMaker® program into the curriculum has been beneficial to the students?

2. Do you think reading scores have improved due to the implementation of the SuccessMaker® program?

3. Do you think students enjoy using the SuccessMaker® program?

4. Do you think CAI (computer-assisted instruction) such as the SuccessMaker® program is a good way for students to learn? Why or why not?

5. Are there any reading skills that you feel the SuccessMaker® program does not include?

Student Interview Questions

1. Do you feel that students like the SuccessMaker® program? Why or why not?

2. Do you think that students are becoming better at reading and math because of the use of the SuccessMaker® program?

3. How could the use of the SuccessMaker® program be improved?