S PE-400 RESEARCH PROJECT: IMPROVING READING/WRITING SKILLS

	#13	#14	#25	#21	#15	#19	#20	#22	#23	#24	#26	#28	#29
GRAMMO J.	100 95	100 80	100 90	100 80	95	95	100 90	85	100 80	85	90	80	100
JACKMAN M.	90	90	100 85	100 80	90	100 85	95	100	100	90	95	100	95
MORRIS S.	100 90	100 80	100 90	100 100	95	90	100	95	95	100	100	90	100 80
PERI C.	90	90	100 90	85	100 80	90	85	100 100	100 90	85	90	85	100 80
GRAMMO A.	95	90	100 80	95	90	100 85	95	95	90	100 80	100	85	85
FLEICHER J.		85%											

SUPER COMPUTER STUDENT

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SUPER COMPUTER STUDENT

SLE 400
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Very nicely presented!

Course grade A

SPE 400 Project

Improving Writing/Reading Levels

1. PROJECT OBJECTIVE/FOREWORD

The objective of this research/project was to 'improve' the existing levels of language skills, in particular spelling skills, in a given population sample. In the following pages it will be seen how this was stated in terms of a variety of behavioral objectives. The measured changes concerned an academic behavior rather than an attitudinal one. It also provided some experimental feedback on the use and impact (measured and weighted to the possible extent) of computers in the learning process. The ultimate stage of this research effort - out of the scope of this particular paper - would have been the design and implementation of a full computerized English Lab Programme for the school's population. Being the sample size "small" and a very short time framework, it is necessary to point out that although statistical tools were used in the project the aim was to formalize the sample behavior measurements (description /analysis/evaluation) rather than imply inferences/ extrapolate conclusions for the rest of the population. The selection of individuals to be monitored was simply based on the availability of subjects that offered the highest observable frequencies and had time for the project. Throughout the process the main motif was be to reinforce work or ACTION (perform, do,) .vs. inactivity or passivity. Although the testing/screening was performed on 'regular' students, the procedures implemented are thought to be usable with hearing-impaired individuals, save for the oral reinforcement aspects. Health-impaired as well as speech-impaired learners might also profit from this study. So will so-called 'non-native speakers' and ESLers. Besides English, any other language could have been used as well. In fact, a very short mini-project using 20 German words was added as an appendix.

2. BRIEF OVERVIEW

Before proceeding the following definitions are included for reference/to have common grounds:

- teaching — controlling the environment to effect learning
- learning — a change in behavior
- behavior — any measurable/countable/observable external or internal act (w/beginning and end) of an organism

Basically, the BEHAVIOR to be studied/measured/reinforced was providing the correct (spelling) answer to words pertaining to an N-word list. This was implemented in a variety of ways:

1. the student was asked to select (by pressing the right key) one of three spelling alternatives presented to him/her by a computer program (please see program descriptions) (MECC SPELLING Vol.2);

2. the student was asked to write them down on a piece of paper;

3. the student was asked to type in self-made short fragments USING at least given number of them and checking them against a spelling checker program (BANK STREET SPELLER)

4. the student was asked to unscramble words from the list. (MAGIC SPELLS)

In order to CONTROL the environment/TEACH the desired behavior the following tools/aids were used:

- an Apple II series computer
- a base software library
  - Bank Street Writer
  - Bank Street Speller
  - MECC Spelling Volume 2 (customizable)
  - MECC's Readability Levels
- additional pieces of software to provide project flexibility/further stimuli
  - Word Wizards
  - Spelling Bee Games
  - Magic Spells
  - MECC Spelling Volume 1
  - English: Parts of Speech
  - The Nystrom Write Steps Series
  - Oh, Deer
  - The Secrets of Science Island
  - MECC Social Studies Volumes 2 & 6
- a wall chart with red dots (stickers)
- an oral reinforcement schedule
- reinforcement schedule charts

The use of a microcomputer permanently reinforced the correct results on a fixed one-to-one ratio schedule (that is, for every correct spelling choice it would issue a reinforcement message like 'That's right', 'Super!'). It also helped maintain a high level of base reinforcement schedule. At the same time it was used to keep track of progress, an accompanying wall chart also provided a fixed ratio schedule but in a many-to-one relation (several behaviors one reinforcing red dot). The oral reinforcement scheme (action: praising) was featured using several variable ratio schedule schema. Modeling when noticed was reinforced right on the spot (FR1).

The reinforcement mix operated in several modes:

- reinforcements were featured at different stages

- reinforcements were tried at the same time

- changed dynamically, since migration was to go from a rich start to a leaner combination

Each stimulus used was categorized/identified/recorded as being positive, negative or aversive (which ALSO were included). Besides, a qualification whether they were primary or secondary - most of them - was included.

Again, some more definitions must be included to assure that the key terms used are clearly identified:

- population: all members of a defined group
- schedule: a plan for reinforcements
- operant rate: normally occurring rate of a behavior
- baseline: a MEASURED operant rate
- sample: a subset from a given population

The first day of activities each student was asked to work /score on a set of five selected computerized spelling drills. In measuring the baseline, the current specific behavior/response level was obtained. The next step was to start using the reinforcers to reach a certain response level (i.e. the level of spelling mastery). The words to be used in the project were measured to be 9-10 thru 16 college on the Dale-Chall scale. Therefore the level of difficulty was gradually increased from one session to the another. In total, thirteen drills were featured ranging from 9-10 Dale Chall reading level up to 16 (college). However, particular attention was paid throughout to the subset of the 'core' five original drills. The process was extended along four weeks. At the end of each week a photocopy of the red dot chart - depicting the weekly progress - was made and scores were numerically recorded, thus giving rise to the matrices to be found on the following pages. The matrices show the student scores as percentages. If a student, say, would spell correctly 16 out of 20 words it would be awarded a 16/20 * 100 score (i.e. 80). This translation was automatically done by the computer.

The students were then asked to score on all thirteen drills. "Good" or "bad", scores were written on the wall chart. If they attained an 80 % as measured by the computer program they would be given a red dot enabling them to move on to raise performance on other drills. Successful scores were entered at the RIGHT UPPER corner of the square using BLACK ink. Students were initially promised that whoever completed his/her chart row with red dots, plus "surviving" (i.e. scoring 100%) a testing set of three consecutive drills elected at random was to be

awarded three periods of free computer activities using software pieces of their choice (i.e. Print Shop, Oh Deer, etc.). This reinforcer was simply mentioned at the beginning and not used thereafter to 'drive' the students. (It was not reiterated). Intermediate reinforcers (silver plated stickers) were used to encourage students that having completed the row of red dots weren't able yet to survive the last requirement. Students scoring 100% but failing to complete three drills on a row were still rewarded by writing IN RED the 100% scores achieved on the LEFT UPPER corner of the drill's square. The main reinforcer throughout was the graphical system consisting of the wall chart and stickers.

3. BASELINE MEASUREMENT (Initial assessment/Pre-testing)

The first day of activities each student was asked to work/score on a set of five selected computerized spelling drills. In measuring the baseline, the current specific behavior/response level was obtained. Scores were numerically recorded, thus giving rise to the following matrix. The matrix shows the student scores as percentages. If a student, say, would spell correctly 16 out of 20 words it would be awarded a 16/20 * 100 score (i.e. 80). This translation was automatically done by the computer.

BASELINE MEASUREMENT

Date: May 26th 1986

	MECC's Spelling Vol. 2				
Drill Number	#11	#15	#21	#25	#13
Reading Level (Dale-Chall)	9-10	16	9-10	9-10	11-12

Scores:

							MEAN	INDIVIDUAL STD. DEV.	MED.A	MED.B
	grade									
Karl	(11)	75	75	75	90	70	77	7.583	75	75
Erika	(10)	65	90	80	85	70	78	10.368	80	80
Carey	(10)	80	95	100	90	85	90	7.906	90	90
Martin	(10)	70	75	85	80	60	74	9.618	75	75
Greg	(10)	30	65	60	80	55	58	18.235	60	60
GROUP	MEAN	64	80	80	85	68				
	STD.DEV.	19.81	12.25	14.58	5	11.51				
	MEDIAN A	70	75	80	85	70				
	MEDIAN B	70	75.25	80	85	69.75				

Notes: The number in parentheses after the name is the individual's school grade, e.g. Karl is in eleventh grade, Erika is in tenth grade, and so on.

As it can be seen in the matrix there are some individuals that already have a 'good' standing (i.e. showing a score greater or equal to 80 % in some drill, for example Erika seems to be good at spelling). The idea of the project was to IMPROVE/RAISE their level of performance (i.e. show an increment)

All names are fictitious.

As it can be seen two different 'medians' are included:

MEDIAN A

Median A is just the number selected by the following procedure:

1. arrange the scores in ascending order (from lowest to highest)

2. being the number of scores odd, the median (labeled MEDIAN A) is the middle score
   e.g. 70 75 75 75 90 =¿ med A = 75

This procedure is to be used when the number of observations is relatively small and the data are not grouped in class intervals.

MEDIAN B

The second median is to be used when it is of interest to group the scores in class intervals. The formula foundations can be found in (Hinkle, Wiersma, Jurs pp. 36-37).

Median B was computed using the following formula :

$$\text{Mdn B} = \text{lower exact limit} + (N * 0.5 - Cf) / f_i$$

where

ll = lower exact limit of the interval containing the N * 0.5 score

N = the total number of scores (5 in our case)

Cf = the cumulative frequency of scores below the interval containing the N * 0.5 score

f_i = frequency of scores in the interval containing the N * 0.5 score

The last four columns indicate the individual's mean, standard deviation and the median. We need these initial scores in order to have a measure of the individual's progress at the end of the observation period. (INDIVIDUAL ACHIEVEMENT)

The last four rows help us DISCRIMINATE the individual's standing against her/his peers.

Scores were issued by the computer as a percentage:
for example 80% means student pressed the right key in 16 out of 20 occasions.

4. Subsequent Measurements

WEEK ONE MEASUREMENT

Date: May 29th 1986

	MECC's Spelling Vol. 2				
Drill Number	#11	#15	#21	#25	#13
Reading Level (Dale-Chall)	9-10	16	9-10	9-10	11-12

Scores:

								INDIVIDUAL		
	grade						MEAN	STD. DEV.	MED.A	MED.B
Karl	(11)	80	95	80	90	85	86	6.52	85	85
Erika	(10)	90	90	80	85	90	87	4.47	90	89.667
Carey	(10)	80	95	100	90	90	91	7.42	90	90.25
Martin	(10)	70	80	85	80	70	77	6.71	80	79.75
Greg	(10)	30	65	60	80	95	66	24.34	65	65
G R O U P MEAN		70	85	81	85	86				
STD.DEV.		23.45	12.75	14.32	5	9.62				
MEDIAN A		80	90	80	85	90				
MEDIAN B		79.75	90	80.25	85	89.75				

Notes: The number in parentheses after the name is the individual's school grade, e.g. Karl is in eleventh grade, Erika is in tenth grade, and so on.

All names are fictitious.

As it can be seen the two different 'medians' are also included.

The last four columns indicate the individual's mean, standard deviation and the median. We need these scores in order to have a measure of the individual's progress at the end of the observation period. (INDIVIDUAL ACHIEVEMENT)

The last four rows help us DISCRIMINATE the individual's standing against her/his peers.

Scores were issued by the computer as a percentage:
for example 80% means student pressed the right key in 16 out of 20 occasions.

WEEK TWO MEASUREMENT

Date: June 5th 1986

MECC's Spelling Vol. 2

Drill Number	#11	#15	#21	#25	#13
Reading Level (Dale-Chall)	9-10	16	9-10	9-10	11-12

Scores:

	grade						MEAN	INDIVIDUAL STD. DEV.	MED.A	MED.B
Karl	(11)	80	95	80	90	85	86	6.52	85	85
Erika	(10)	90	90	80	85	90	87	4.47	90	89.667
Carey	(10)	80	95	100	90	90	91	7.42	90	90.25
Martin	(10)	90	80	85	80	90	85	5	85	85
Greg	(10)	90	90	60	80	95	83	13.96	90	89.75

GROUP						
	MEAN	86	90	81	85	90
	SID.DEV.	5.48	6.12	14.32	5	3.54
	MEDIAN A	90	90	80	85	90
	MEDIAN B	89.67	90.25	80.25	85	90

Notes: The number in parentheses after the name is the individual's school grade, e.g. Karl is in eleventh grade, Erika is in tenth grade, and so on.

All names are fictitious.

As it can be seen the two different 'medians' are also included.

The last four columns indicate the individual's mean, standard deviation and the median. We need these scores in order to have a measure of the individual's progress at the end of the observation period. (INDIVIDUAL ACHIEVEMENT)

The last four rows help us DISCRIMINATE the individual's standing against her/his peers.

Scores were issued by the computer as a percentage:
for example 80% means student pressed the right key in 16 out of 20 occasions.

WEEK THREE MEASUREMENT

Date: June 12th 1986

MECC's Spelling Vol. 2

Drill Number	#11	#15	#21	#25	#13
Reading Level (Dale-Chall)	9-10	16	9-10	9-10	11-12

Scores:

	grade						MEAN	INDIVIDUAL SID. DEV.	MED.A	MED.B
Karl	(11)	80	95	80	90	95	88	7.583	90	90
Erika	(10)	90	90	100	100	90	94	5.477	90	90.33
Carey	(10)	100	95	100	100	100	99	2.236	100	99.875
Martin	(10)	90	80	85	80	90	85	5	85	85
Greg	(10)	90	90	95	80	95	90	6.124	90	90.25

GROUP						
	MEAN	90	90	92	90	94
	SID.DEV.	7.07	6.12	9.08	10	4.18
	MEDIAN A	90	90	95	90	95
	MEDIAN B	90	90.25	95	90	94.75

Notes: The number in parentheses after the name is the individual's school grade, e.g. Karl is in eleventh grade, Erika is in tenth grade, and so on.

All names are fictitious.

As it can be seen the two different 'medians' are also included.

The last four columns indicate the individual's mean, standard deviation and the median. We need these scores in order to have a measure of the individual's progress at the end of the observation period. (INDIVIDUAL ACHIEVEMENT)

The last four rows help us DISCRIMINATE the individual's standing against her/his peers.

Scores were issued by the computer as a percentage:
for example 80% means student pressed the right key in 16 out of 20 occasions.

ADDENDUM

WEEK FOUR MEASUREMENT

Date: June 19th 1986

MECC's Spelling Vol. 2

Drill Number	#11	#15	#21	#25	#13
Reading Level (Dale-Chall)	9-10	16	9-10	9-10	11-12

Scores:

	grade						INDIVIDUAL MEAN	STD.DEV.	MED.A	MED
Karl	(11)	100	95	100	100	100	99	2.24	100	99.
Erika	(10)	90	90	100	100	90	94	5.477	90	90.
Carey	(10)	100	95	100	100	100	99	2.236	100	99.
Martin	(10)	90	100	85	100	90	93	6.71	90	90
Greg	(10)	90	90	95	100	95	94	4.18	95	94

GROUP					
	MEAN	94	94	96	100	95
	STD.DEV.	5.47	4.18	6.52	0	5
	MEDIAN A	90	95	100	100	95
	MEDIAN B	90.33	94.75	99.67	100	95

5. Procedures

Description and Analysis

The terms and definitions used in this section are taken from Hewett's (Chapter 9) and it was the author's intention to apply/classify/identify each teacher activity in terms of Hewett's wording. Hewett & Forness distinguish three "basic ingredients of good teaching - curriculum, conditions, and consequences."

Basically, the learning task, activity or assigment (CURRICULUM) was spelling regular English words. Students were asked to work on a initial base list of 100 words, which was later expanded to included a total of 260 words. In terms of behavioral objectives, it can be said that students had to show/display the ability of properly spelling all the words in the given list. More precisely, this "proficiency" was measured/monitored in two ways:

- students were asked to use a computer program (i.e. involved PRESSing a key indicating the correct alternative or in Hewett's words, "push(ing) a button on an automated teaching device"); the computer would then issue the score;

- students were asked to write them down on a piece of paper - a "pop quiz" was featured in the third week - the instructor would mark the papers;

It could have been possible to use other ways of carrying out the activity and related measurements as well. This in fact, is what Hewett refers to as the CONDITIONS under which the "educational task" is performed. Students could have been alternatively asked to:

- spell them aloud (i.e. saying the letters of the word in order)
- point to a particular card containing the word written
- circle the correct answer with pencil on a worksheet
- push a button on an automated teaching device other than a regular microcomputer

For every drill the student completed with 80% accuracy or more he/she received a RED DOT STICKER. The initial score, unless already over 80% was written at the CENTER of the corresponding square. At the same time records were being kept the learner was reinforced: we would be adding red dots to the environment (a positive reinforcer) as well as covering the initial (lower) score. Thus, the "offending" score would be

removed from the environment (a negative reinforcer). Besides the newly produced score over 80% was written at the right upper corner.

Students achieving the intermediate goal (completion of red dot row) were publicly pointed out as models (MODELING) included HAND-SHAKING and PRAISING. SILVER PLATED STICKERS reading "Super Computer Student" were awarded at this time.

Once students succeeded in flawlessly completing three drills at random "on a row" they were awarded a second SILVER PLATED STICKER reading "APPLE EXPERT ". At this final stage, besides, they were rewarded with the use of - to them yet unknown - highly "popular" programs:

Oregon	(MECC Software Library)
The Secrets of Science Island	
Oh, Deer	(MECC Software Library)
States	(MECC Software Library)

In short, the following items were used to effect reinforcement/present stimula:

- a graphical wall system with red and silver plated stickers;
- modeling (+ compliments);
- oral reinforcement schedules (see ff pages);
- three periods of free computer activities;
- 1 coke (not measured);
- patting shoulder (not measured);
- shaping (not measured)

It can be said that the main/major reinforcer throughout the project was the red dot wall chart. At the same time it served for record keeping purposes kept the students informed of their individual current standing among/against his/her peers. It - see also student feedback appendix -, intentionally constituted a way of gathering several aspects concerning CONSEQUENCES:

- students enjoyed receiving TANGIBLE REWARDS(Hewett's pp. 292-293);

- was a measure of SOCIAL APPROVAL (many students often said "Hey, don't write that down, I can do much more better!") as well as profiting from COMPETITIVE spirits (Hewett's pp. 288-289);

- the colors involved (bright red and silver plated stickers) did provide a SENSORY - visual - STIMULATION (re: Hewett's "Bombard the Senses", "Make it Vivid", pp. 272-273, 291-292);

- helped "Accentuate the Positive": "red bright" records were kept of successful drills while almost no attention was paid to drill performances below the passing level (except of course to point them out as temporarily yet outstanding);

- provide the "positive CONSEQUENCE of knowing how you stand in relation to some criterion" (KNOWLEDGE OF RESULTS, Hewett's pp. 287-288)

Some other items were not measured, for example the primary reinforcers (patting, coke) although they were featured on occasion. Shaping, although not formally analyzed was indeed occurring at all times: students strived and were rewarded for better and better spelling scores. (Re: Shaping = reinforcing successive approximations of a behavior).

The oral reinforcement schedules were tried individually. Please refer to the section concerning schedules for the analysis of each schedule. Probably the most effective oral reinforcements (FR 1) were when MODELLING was taking place.

6. Progress Analysis/Project Development & Evolution

6.1. Evolution of the Individual Means

(based on the five basic drills)

	BS	WK 1	WK 2	WK 3	WK 4
Karl	77	86	86	88	99
Erika	78	87	87	94	94
Carey	90	91	91	99	99
Martin	74	77	85	85	93
Greg	58	66	83	90	94

Notes: Data for the fourth week can calculated from the wall chart.

In order to have another perspective regarding the progress made (maybe more accurate), it would have been interesting to append the averages covering the WHOLE set of thirteen (both "basic" and "non-basic") drills used. In fact, since students spent time working "non-basic" drills, it happened that they did not increase their marks on the "basic" ones. For example, in the second row, it is very likely that Erika worked on the basic drills the first week attaining a 87 average, then in the second week moved to non-basic drills - thus freezing the 5-drill mean - and was back to improve levels on the third week. Something similar occurred with Carey and Karl.
The computation of these extended means would have been a more fair measure of progress, but the project had to be kept within some time constraints.

Besides, it could have been possible to define an average of averages in order to trace/record an overall measure of collective progress.

6.2. Evolution of the Individual Standard Deviations

	BS	WK 1	WK 2	WK 3	WK 4
Karl	7.583	6.52	6.52	7.583	2.24
Erika	10.368	4.47	4.47	5.477	4.48
Carey	7.906	7.42	7.42	2.236	2.236
Martin	9.618	6.71	5	5	6.71
Greg	18.235	24.34	13.96	6.124	4.18

Notes: Keeping track of the individual (horizontal) standard deviation helps us examine "how evenly" a student performed on the drills. In other words, gives us a measure of how the student gets equally proficient on ALL five basic drills. For example, Greg's initial 18.235 indicates that he performed irregularly on some of them (for example scoring very low or very high from his "central tendency"). However, he was able to smooth things down to one third of the original standard deviation. On the other hand, Carey, for example initially very "even" - although not the "most even" on her performance, was clearly able to work out the drills and also narrow the difference to one third of the original value.

Again, it would have been desirable to define a global standard deviation to study the behavior evolution of the group as a whole.

6.3. Evolution of the Vertical Means

	BS	WK 1	WK 2	WK 3	Wk 4
Drill 11	64	70	86	90	94
Drill 15	80	85	90	90	94
Drill 21	80	81	81	92	96
Drill 25	85	85	85	90	100
Drill 13	68	86	90	94	95

Notes: This matrix gives us an idea of "how well on average" students were faring on each individual drill as the project proceeded. In other words, provided a measure of the group's average score on each drill. Loosely speaking it could be said that initially drills # 15 & 21 seemed to be the "easiest" while drill # 11 seemed to be the "most difficult". It is interesting to note that drill # 13 appears on week three with the highest score.

Again, it would have been a more accurate measurement to include in the calculations scores for all the drills.

6.4. Evolution of the Vertical Standard Deviations

	BS	WK 1	WK 2	WK 3	WK 4
Drill 11	19.81	23.45	5.48	7.071	5.47
Drill 15	12.25	12.75	6.12	6.12	4.19
Drill 21	14.58	14.32	14.32	9.083	6.52
Drill 23	5	5	5	10	0
Drill 13	11.51	9.62	3.54	4.183	5

Notes: This matrix helps us view how the students spread on a given drill. It displays how student skill level get nearer each other or spread out. It gives an idead of how the individual scores can be "homogenized". (Students scoring very close together/ clustering) For example, it seems that initially Drill # 19 produced scores that differed the most, while Drill # 5 produced scores that differed the least. During the second week three drills (#11, # 15 & # 13) produced scores that were more tightly packed/converged than in the previous week. An increase in this value could be explained for example that a student having already a "high" mark would increase his/her score, while no one else improving that drill's score during a specific week. This will clearly identify someone who's increasing the distance from the central values.

6.5. Evolution of the Individual (Horizontal) Medians

(based on the five basic drills)

Median A

	BS	WK 1	WK 2	WK 3	WK 4
Karl	75	85	85	90	100
Erika	80	90	90	90	90
Carey	90	90	90	100	100
Martin	75	80	85	85	90
Greg	60	65	90	90	95

Median B

	BS	WK 1	WK 2	WK 3	WK 4
Karl	75	85	85	90	99.88
Erika	80	89.667	89.667	90.33	90.33
Carey	90	90.25	90.25	99.88	99.88
Martin	75	79.75	85	85	90.25
Greg	60	65	89.75	90.25	94.75

Notes: Data for the fourth week can calculated from the wall chart.

Remarks similar to the ones mentioned when discussing the mean matrices can be applied here. Essentially these statistics let us measure the progress the individual made (individual achievement). As before, it would have been more accurate to evaluate the median over the WHOLE set of drills. It would have been also desirable to define an average of averages in order to trace/record an overall measure of collective progress.

This data was use to prepare the individual bar graphs.

7. Some Remarks Concerning Project Development

Some students hardly needed a trigger to initiate the task, however some of them dropped the rate after the first day. The red dot wall graphic system did encourage two of them to complete their respective rows at the earlier days of the second week. The first one to complete reacted only to the red dot motivation. The second one to complete was urged to complete her two remaining drills when she saw that an unexpected silver plated sticker was awarded to the first one. The chart profit from competitive spirit. The first week 25 red dots were awarded.

On the second week one of the students that scored low on the first week was 'treated' with a VR4 but it was experienced that - predictably enough - more encouragement was needed. The sequences selected were felt unbalanced because different ordering of the data would in effect have a different artificial mean:

2,5,3,1,4,3,6,7,5 (initially rich and diminishing)
would prove different
6,1,7,5,4,5,3,2,3 (the reverse)

On that same week the second student to complete the chart row was treated once with the same treatment, but was not necessary to continue any reinforcement thereafter.

On the second week 23 red dots and 2 silver plated stickers were awarded.

On the third week the following sticker were earned:

14 red dots
2 silver stickers (SUPER COMPUTER STUDENT)
2 silver stickers (APPLE EXPERT)

By the fourth week ALL students had completed the chart's rows, and several students showed having received silver-plated stickers. Please refer to the chart for final values.

8. Oral Reinforcement Schedules

Basically only two oral reinforcement schedules were used. Both concerned ratio schedules, the first one a VR 4 and a second one FR 2.

The variable ratio schedule VR 4 was tried during the second week on Erika (M), Martin (C) and Greg (A). The following sequence was tried:

2,5,1,5,3,6,4,7,3

9 runs of length L averaging 1 reinforcement to 4 behaviors. The scheme proceeded like this:

The instructor would sit by the student as he/she worked on the drill and every L consecutive correct spellings would issue an oral reinforcement like "Good, Erika!", "Super, Greg!", "Keep it up, Martin". It was found that both Greg and Martin needed a richer - more reinforcements per behavior - schedule (see the marks obtained) so they were treated with a FR 2 schedule. In that week the median for Martin increased from 79.75 to 85, while Greg's median went from 65 to 89.75.

Variable Ratio VR 4 Schedule Marks

L	Erika(Drill# 24)	Martin(Drill# 19)	Greg(Drill# 11)
2	I	II (hit)	I
5	IIIII (hit)	II	II
1	I (hit)	I (hit)	-
5	IIIII (hit)	III	IIIII (hit)
3	III (hit)	II	-
6	III	I	-
4		II	I
7			-
3			I

For example, the second line in the table indicates that Erika correctly spelt 5 words on a row and thus received an oral reinforcement (noted as "hit" in the table). In a similar way, she was able to receive a string of oral reinforcers. Greg and Martin weren't that lucky to receive reinforcers. It suggested that waiting "on average 4 behaviors to reinforce" was not the best way to encourage them to raise their score levels. A fixed ratio schedule FR 2 was tried instead.

9. Individual Progress Analysis

Karl

Started with a baseline of 75. Was systematically exposed to the red dot chart reinforcer and hardly anything else was needed to make him complete the assignment. No oral reinforcer was used. He completed the chart row by the third week although he scored above 80% on the five basic drill the first week. The fourth week was awarded a second silver-plated sticker after completing the three successive random drills. Ended with a a median greater than 90. 99.88

Erika

Started with a baseline of 80. A VR 4 was used the second week to increase performance. She completed the chart row by the second week, thus receiving her first silver-plated sticker. Was pointed out as a modelling situation. By the third week she was able to complete the three-on-a-row-random-drill-test and was awarded a second silver-plated sticker. Ended with a median greater than 90. 90.33

Carey

Started with a baseline of 90. Was systematically exposed to the red dot chart reinforcer and hardly anything else was needed to make her complete the assignment. No oral reinforcer was used. Was the first one to complete the chart row - done during the second week . Carey was pointed out as a modelling situation and was extremely motivated by stickers. Received her second silver plated sticker on the third week after successfully completing the three random drill test. Ended with a median greater than 99.875. 99.88

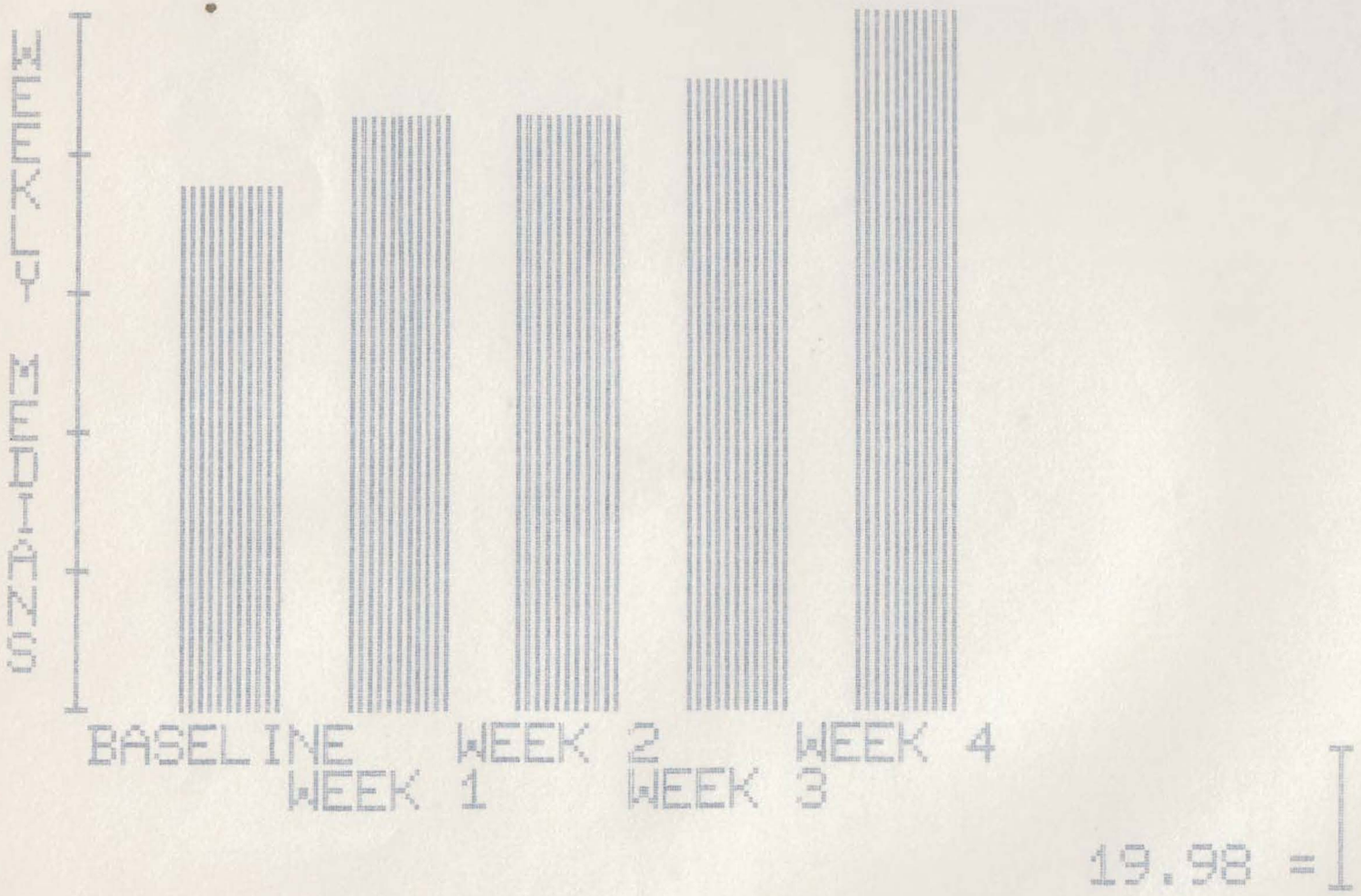
Martin

Started with a baseline of 75. Initially the red dot chart didn't seem to affect him. Needed oral reinforcement to "ignite" activity. A great leap after this, the median went from 79.75 the first week to 85 the second week. Ended with a median greater than 85. Was awarded a silver plated sticker the third week. 90.25

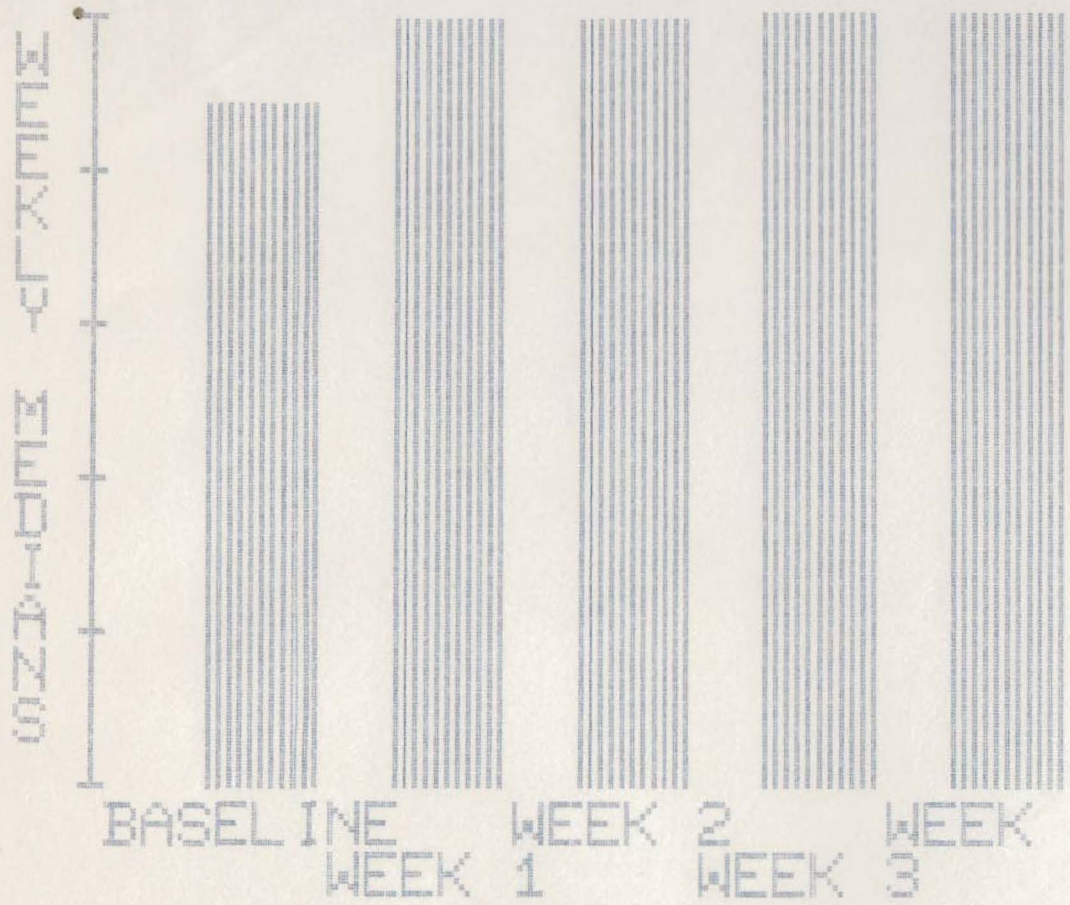
Greg

Started with a baseline of 60. Initially the red dot chart didn't seem to affect him. Needed oral reinforcement to "ignite" ativity. A great leap after this, the median went from 65 the first week to 89.75 the second week. Ended with a median greater than 90.25. Was awarded his first silver plated sticker on the fourth week. 99.75

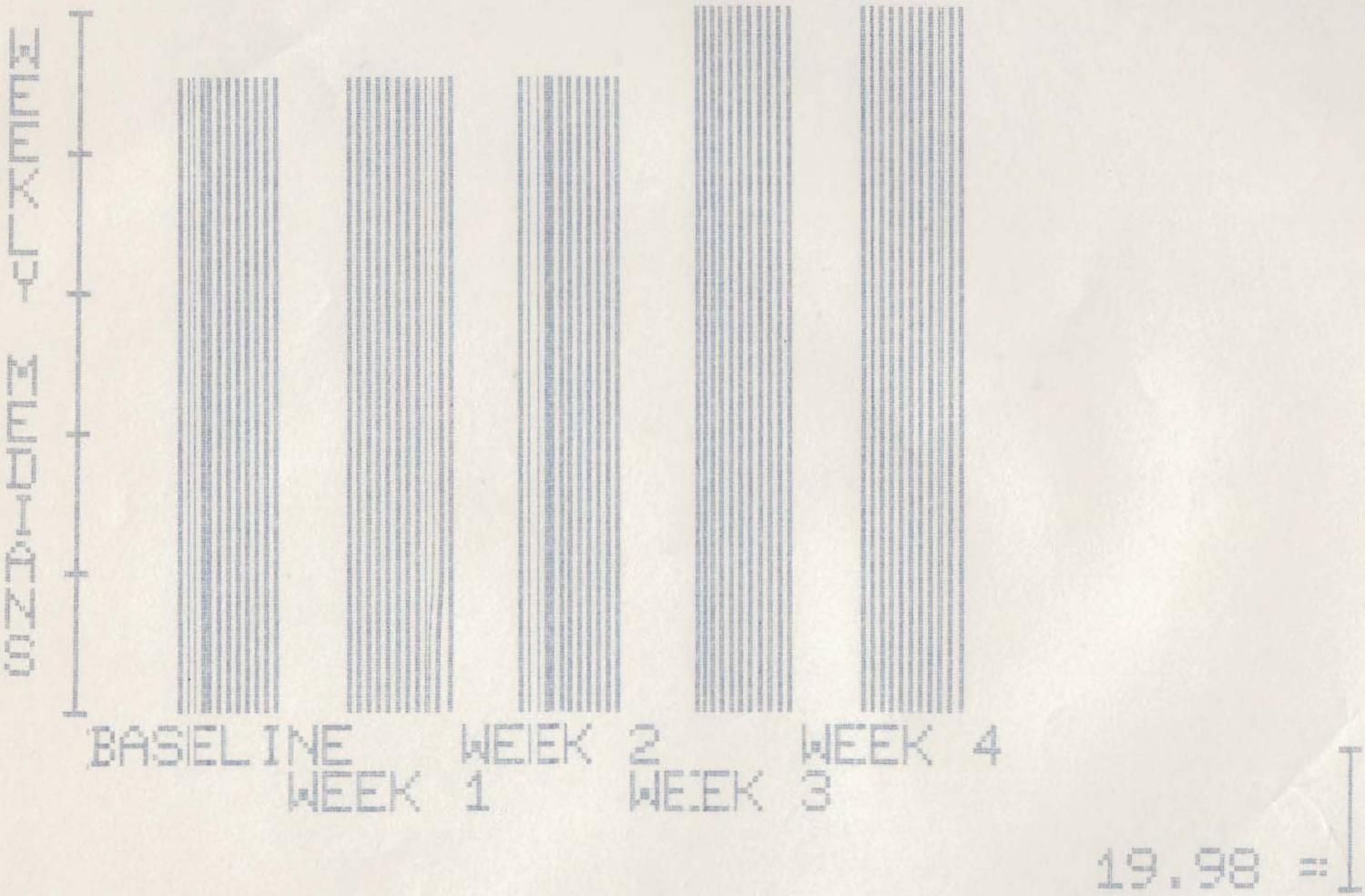
KARL'S MEDIAN EVOLUTION



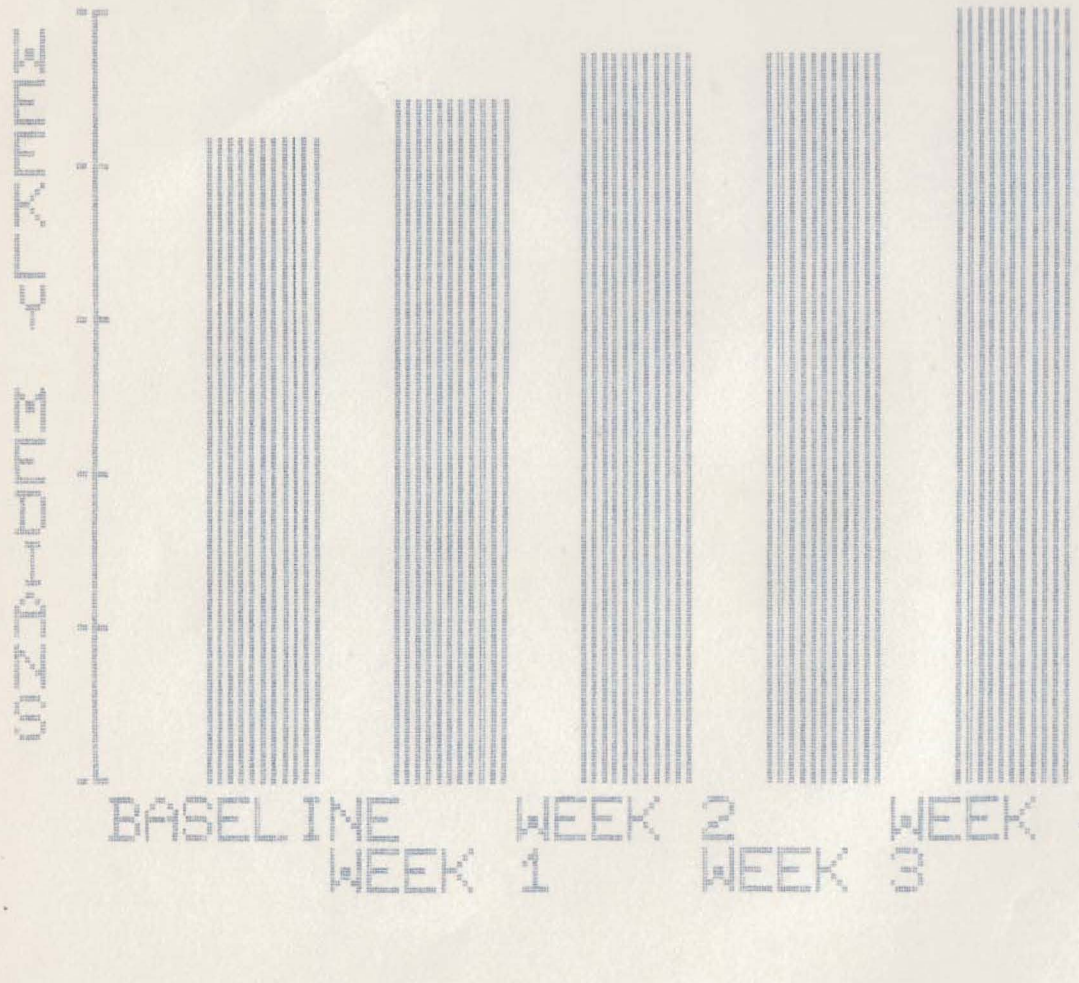
ERIKA'S MEDIAN EVOLUTION



CAREY'S MEDIAN EVOLUTION

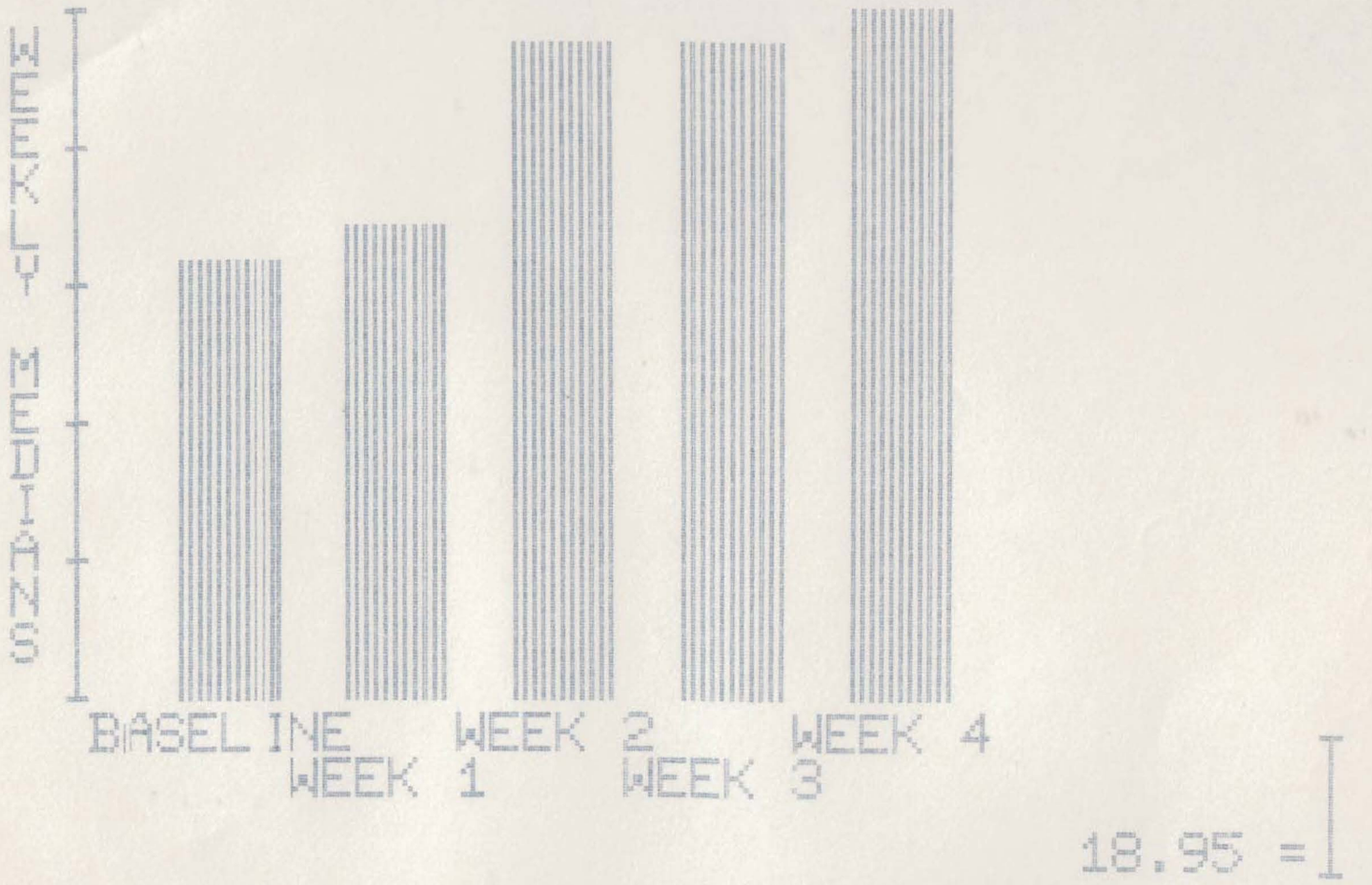


MARTIN'S MEDIAN EVOLUTION



18.05 =

GREG'S MEDIAN EVOLUTION



10. Summary

Time frame

4 weeks — 16 observations
4 times each week
15-30 minutes a time

Material

MECC's Spelling Vol. 2
Bank Street Speller
Bank Street Writer

Sample Size

6 students from tenth and eleventh grades

Behavior

Providing the correct answer to a given list of words by pushing keys on a microcomputer

Behavior change to be observed/measured

Spelling level of the students (i.e. attaining an 80% score on ALL 13 selected drills). No attempt was considered to finely relate this to the time frame - it would have been interesting though - but there were several factors that rendered the values invalid:

the time framework is to short
(plus some student absent days);
not enough copies of the program were available
to carry out the process at the same time;

It would add information (the steeper the slope the faster the improvement) but the existing circumstances at the current moment involved the risk of making a gross judgement: among other facts students being absent, number of disk copies available.

Reinforcement Schedules Used

1-to-1	FR1	computer would issue phrases like "RIGHT ON, ERIKA!","SUPER, MIKE!"
16-to-1	FR16	for every drill completed with 80+% accuracy student was awarded with a distinctive red dot (1st week on)
260-to-1	FR260	once the student covered the whole row with earned red dots a silver plated sticker with the legend "SUPER COMPUTER STUDENT" was issued (2nd week)
VR4	VR4	teacher would sit beside student and offer oral reinforcement using the following sequence: 2,5,1,5,3,6,4,7,3 with an average of 4 behaviors per oral reinforcement
FR2		same as above but with a mean of 2

MECCS Spelling Vol. 2

Spelling Volume 2 consists of 30 drills each containing a set of 20 spelling words. An individual drill always contains the same twenty words that are presented in random order each time the student accesses the specific drill. These words are presented in a multiple choice format. The student is given an incomplete sentence and a choice of three spellings for the word that completes the sentence. As the students work through the material they are given the opportunity to practice typing misspelled words thus adding a kinesthetic dimension to the learning experience. For example, if properly spelt the student would have to retype the word once, otherwise the program would ask him/her to retype the word three times. One of the main advantages of this program is that it can be customized (i.e. change, vary, or increase the reading level of the material) to suit individual needs. The words taken for the project are extracted from the disk's basic list compiled by various researchers in spelling instruction. The reading level presented to the students ranged from 9-10 (Dale Chall) to 16 College level. The current drills used were discriminated as follows:

Reading Level (Dale Chall)	Drill Numbers
9-10	11,21,25
11-12	13,17,19,20,22,23,24,26,28,30
13-15	29
16 College	12,14,15,16,18,27

The following drills constituted the core of five "basic" drills that were to be closely monitored throughout the project:

11 # 13 # 15 # 21 # 25

Upon drill completion, the computer would issue messages like:

"Your score, Carey, is 85
percent, you scored in
the green"

Disadvantage: No record is kept of which words are missed by students, nor can be a student record file created.

BANK STREET SPELLER

This program was used only once and by some students after the pop quiz. They were asked to compare the words written on the quiz paper against the on-line spelling dictionary.

MAGIC SPELLS

This program was used to present the mini project featuring twenty German words.

12. Bibliographic Notes

1. Hewett, F. & Forness, S.
   "Education of Exceptional Learners"

2. Hinkle, Wiersma & Jurs
   "Applied Statistics for the Behavioral Sciences"

3. Bank Street Speller Reference Manual

4. MECC Spelling Volume 2 Reference Manual

5. Magic Spells Instruction Booklet

6. Langenscheidts Schulwoerterbuch Englisch

Appendix A: Related Mini-Projects

Besides the major project concerning spelling levels, two other similar mini-projects were partially developed. Both follow the same approach and provided examples of how computer-based materials can be easily and effectively incorporated in the school curriculum. The programs selected were taken from the school's existing software library (SPE software is just recently surfacing, e.g. SchoolTechNews recently mentioned 27 programs that were explicitly aimed to be used in SPE. Also a computerized IEP program was advertised).

The first mini-project objective was to teach the students the capitals of the fifty U.S. states. (i.e. name the capital of a given state) They were alternatively asked to name them aloud, write them on a piece of paper or type the names into the microcomputer using the States program from MECC's Social Studies Vol. 2. A matrix of scores was similarly constructed and progress was recorded using a sequence of score matrices. The state capitals were divided into the following regions:

New England states
Eastern states
Southern states
Central states
Western states
Whole country

As a matter of fact the baseline for this project was surprisingly similar - unfortunately - to that of the second mini- project.

The second mini-project - tried on only two students - was to spell (learn how to write) twenty German words. The initial baseline was almost null. The length of this project was two sessions of about 35 minutes, using a Magic Spells customized data file. Students practiced the correct position of the characters by drilling in a game format, unscrambling the words, similar to a MasterMind game with hints about letters in the right position. All words were taught to be written in lower case ("illegal" simplification that could have been avoided) and one word was intentionally shortened to fit the 15 character limit imposed by the program. At the end of the mini-project the two students were able to write down the words upon dictation. It was interesting to note that students were not always aware of the MEANING of the word although they had properly spelt them.

WEEK ONE

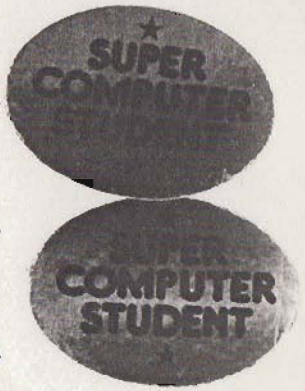
S PE-400 RESEARCH PROJECT: IMPROVING READING/WRITING SKILLS

	#13	#17	#25	#21	#15	#19	#20	#22	#23	#24	#26	#28	#29
GRAMMO J.	85	80	90	80	95	95							
JACKMAN M.	90	70	85	80	90	85	75						
MORRIS S.	90	80%	80	100	95	90	100						
PERI C.	70%	70	80	85	60								
GRAMMO A.	95	30	80	60	65								
FLETCHER J.		85%											

WEEK TWO

PE-400 RESEARCH PROJECT! IMPROVING READING/WRITING SKILLS

	#13	#14	#25	#24	#15	#19	#20	#22	#23	#24	#26	#28	#29
GRAMMO J.	85	80	90	80	95	95	90	85	80				
JACKMAN M.	90	90	85	80	90	85	95	100	100	90	95	100	95
MORRIS S.	90	80%	88	110	95	90	100	95	95	100	100	90	96
PERI C.	90	90	80	85	80	90	85						
GRAMMO A.	95	90	80	60	90	85	70						
FLETCHER J.		85%											



WEEK THREE

S PE-400 RESEARCH PROJECT: IMPROVING READING/WRITING SKILLS

	#13	#17	#25	#21	#15	#19	#20	#22	#23	#24	#26	#28	#29
GRAMMO J.	85	80	80	80	95	95	90	85	80	85	90	80	100
JACKMAN M.	90	90	100	85	100	80	90	100	85	95	100	100	90	95	100	95
MORRIS S.	100	90	110	85	100	80	110	110	95	90	100	95	95	100	100	90	100	95
PERI C.	90	90	80	85	80	90	85	100	100	90	85	90	85	80
GRAMMO A.	95	90	80	95	90	85	95	95	90
FLETCHER J.	85%

S PE-400 RESEARCH PROJECT: IMPROVING READING/WRITTING SKILLS

#13 #17 #25 #21 #15 #19 #20 #22

GRAMMO J.	100	95	100	80	100	85	100	80	95	95	100	90	85	100									
ACKMAN M.	90	90	100	85	100	80	90	100	85	95	100	100	90	95	100	100	100	100	95				
MORRIS S.	100	90	100	80	100	90	100	100	85	90	100	95	95	100	100	100	100	100	100				
PERI C.	90	90	100	80	85	100	80	90	85	100	100	100	100	80	85	90	85	100	80				
GRAMMO A.	95	90	100	80	95	90	100	85	95	95	90	100	80	100	85	85							
FLETCHER J.		85																					

NOTE:

QUESTIONS AND ANSWERS

Reading Level: 9-10 (Dale Chall)

Frame #	Sentence	Choices		
201.	He asked for an _____.	"acquittal"	"acquital"	"aquittal"
202.	Where do you put the _____?	"apostrophy"	"apostrophe"	"apostraphe"
203.	Would you like a _____ with your cereal?	"banna"	"bananna"	"banana"
204.	He's the most likely _____.	"candidate"	"canidate"	"candidat"
205.	What was the _____ factor?	"contoling"	"controlling"	"controlin"
206.	We are using _____ funds.	"deficent"	"defecient"	"deficient"
207.	I hope I won't _____ you.	"emberrass"	"embarass"	"embarras"
208.	Our schedule is _____.	"flexable"	"flexible"	"flexibel"
209.	There was blood on his _____.	"hankerchief"	"handkercheif"	"handkerchief"
210.	Gasoline is _____.	"inflammable"	"inflammible"	"inflamable"
211.	Do you have a _____ reason?	"ligitimate"	'legitimate"	"legitamate"
212.	His paper was only _____.	"mediocer"	"medeocre"	"mediocre"
213.	It was the third _____ of measles.	"occurrence"	"occurrance"	"ocurrence"
214.	It will go into your _____ file.	"permanant"	"permanent"	'permenant"
215.	I never had the _____ of meeting you.	"privlege"	"priviledge"	"privilege"
216.	What a _____!	"relief"	"releif"	"releef"
217.	The _____ were watching their flocks.	"shephards"	"shepherds"	"sheepherds"
218.	Who will be Johnny Carson's _____?	"sucessor"	"successer"	"successor"
219.	Her death was a _____.	"tragedy"	"tragady"	"tradgedy"
220.	Your battery is no longer under _____.	"warrenty"	"warranty"	"waranty"

QUESTIONS AND ANSWERS

Reading Level: 11-12 (Dale Chall)

Frame #	Sentence	Choices
241.	That evidence is not _____ in court.	"admisible" "admissable" "admissible"
242.	Your reasoning is not _____.	"apparent" "apparant" "aparent"
243.	They gave a _____ in her honor.	"bankquet" "banquet" "banquette"
244.	He took a _____ of the votes.	"canvas" "canvase" "canvass"
245.	We will meet at your _____.	"convenience" "conveneince" "convienience"
246.	You must give a _____ reply tomorrow.	"definate" "definite" "defenite"
247.	Have you checked with the _____?	"enciclopedia" "encyclapedia" "encyclopedia"
248.	He went into _____ service.	"foreign" "foriegn" "forren"
249.	He gave a _____ answer.	"haphazzard" "haphazard" "haphazerd"
250.	Would you _____ on my behalf?	"interceed" "intersede" "intercede"
251.	He returned the books to the _____.	"library" "libary" "libury"
252.	You can put that in the _____ file.	"missellaneous" "miscellaneous" "miscellanious"
253.	He _____ the last letter.	"omitted" "ommited" "ommitted"
254.	You will need more _____ than that.	"perseverance" "perseverence" "parseverence"
255.	He is a _____ of communications.	"proffessor" "professor" "professer"
256.	Her _____ are always short.	"replyes" "reples" "replies"
257.	We have had a _____ of bad weather.	"siege" "seige" "seege"
258.	They are _____ for damages.	"sueing" "suing" "sewing"
259.	Who will walk away with the _____?	"triumf" "triump" "triumph"
260.	I have a _____ feeling in my stomach.	"weird" "wierd" "weerd"

QUESTIONS AND ANSWERS

Reading Level: 16 College Graduate (Dale Chall)

Frame #	Sentence	Choices
281.	You have an _____ position.	"advantageous" "advantagous" "advanatagious"
282.	She made an _____ with her doctor.	"apointment" "appointment" "appoinment"
283.	His _____ was erratic.	"behevior" "behavier" "behavior"
284.	She made her _____ in medicine.	"career" "carere" "carear"
285.	She is a network _____.	"correspondent" "correspondant" "corespondent"
286.	He is not a juvenile _____.	"delenquent" "delinquint" "delinquent"
287.	You have quite an _____ going on here.	"enterprise" "enterprize" "entreprise"
288.	Just let me have _____ winks.	"fourty" "forty" "forety"
289.	It has been a _____ day.	"hectec" "hectik" "hectic"
290.	He took out a _____ against his house.	"lien" "lein" "lean"
291.	She learned _____ dance.	"moderen" "modern" "moderne"
292.	You will be a formidable _____.	"opponant" "oponent" "opponent"
293.	He told the office _____.	"personnel" "personal" "personell"
294.	Do I have the correct _____?	"pronounciation" "pronunciation" "pronunsiation"
295.	Shall we eat at this _____?	"res'arant" "restaurent" "restaurant"
296.	There answers were _____.	"simultaneous" "simutaneous" "simultanious"
297.	You are in for a _____.	"surprize" "surprise" "surpriz"
298.	There was _____ of the masses.	"tiranny" "tyrenny" "tyranny"
299.	We don't know _____ we can come or not.	"wheather" "weather" "whether"
300.	Let me know when _____ ready.	"you're" "your" "youre"

QUESTIONS AND ANSWERS

Reading Level: 9-10 (Dale Chall)

Frame #	Sentence	Choices
401.	They came to an _____ stop.	"abrupt" "abbrupt" "abrupet"
402.	They put an _____ in the paper.	"advertizment" "advertisement" "advertisment"
403.	You will have a new _____.	"asignment" "assinment" "assignment"
404.	You must make your story _____.	"believeable" "believible" "believable"
405.	Please pay the _____ on your way out.	"casher" "cashier" "cashior"
406.	They had _____ metal on the roofs.	"corrugated" "coragated" "corregated"
407.	We need a good _____ of your mother.	"description" "discription" "deskription"
408.	You will need an _____ for that letter.	"envelop" "envelope" "envalope"
409.	Who owns the Yankee's _____?	"franshise" "franchize" "franchise"
410.	What _____ do you want the mirror?	"height" "hieght" "hite"
411.	Please don't _____ while I'm talking.	"interfer" "interfere" "interfear"
412.	He is a _____ fellow.	"likebel" "likeble" "likeable"
413.	We must pay our _____.	"mortgage" "morgage" "mortage"
414.	Place the TV _____ the sofa.	"oppossite" "opposite" "opossite"
415.	We should _____ her to come.	"pursuade" "persuaid" "persuade"
416.	I _____ that you will pass the course.	"prophesy" "prophecy" "porphesy"
417.	They will _____ their new plan tomorrow.	"reveel" "reveal" "revele"
418.	I have been sad _____ you went away.	"sence" "sinse" "since"
419.	She was _____ to his charms.	"susceptable" "susseptible" "susceptible"
420.	The verdict was _____.	"unanemous" "unanimous" "unanimuss"

QUESTIONS AND ANSWERS

Reading Level: 9-10 (Dale Chall)

Frame #	Sentence	Choices
481.	The wheels on your car are in poor _____.	"alignment" "alinement" "alinment"
482.	You'll have to speak to their _____.	"attourneys" "attorneys" "attornies"
483.	Have you seen my _____?	"bicicle" "bycicle" "bicycle"
484.	The _____ must study the bill.	"committee" "comittee" "commitee"
485.	He seems to _____ everything I do.	"critecize" "criticize" "critisize"
486.	We watched the sun _____ behind the clouds.	"disappier" "disapear" "disappear"
487.	You will _____ our spending limit.	"exceed" "excede" "exseed"
488.	We need a _____ of good faith.	"jesture" "gesture" "gestur"
489.	Most milk is _____ before being sold.	"homogenised" "homojenized" "homogenized"
490.	Let me know when _____ time to go.	"it's" "its" "its'"
491.	He needs to _____ when he comes off the turn.	"acelerate" "accelerate" "accellerate"
492.	That knot is too _____.	"lose" "luse" "loose"
493.	Her _____ came for a long visit.	"niece" "neice" "neece"
494.	They gave us a _____ which describes their service.	"pamflet" "pamplet" "pamphlet"
495.	They live on the _____.	"priarie" "prairie" "prarie"
496.	What career do you want to _____?	"pursue" "persue" "purrsue"
497.	She gave a _____ answer.	"ridikulous" "ridiculous" "ridiculus"
498.	He had to _____ by the guard.	"sneek" "sneke" "sneak"
499.	They weren't interested in the _____ reasons.	"technical" "technecal" "technikal"
500.	The book was very _____ for my report.	"usful" "useful" "usefull"

Jeffrey D. Gammo
June 9, 1986

Drill 15

281) advantageous ✓
282) appointment ✓
283) behavior ✓
284) career ✓
285) correspondent ✓
286) delinquent ✓
287) enterprise ✓
288) forty ✓
289) hectic ✓
290) lein
291) modern ✓
292) opponent ✓
293) personnel ✓
294) pronunciation ✓
295) restaurant ✓
296) simaltaneous ✓
297) surprise ✓
298) tyranny ✓
299) whether ✓
300) you're ✓

Drill 11

201) acquittal ✓
202) apostraphe
203) banana ✓
204) candidate ✓
205) controlling ✓
206) deficient ✓
207) embarrass ✓
208) flexible ✓
209) ~~handkerchief~~ handkerchief ✓
210) inflammable ✓
211) legitimate ✓
212) mediocre ✓
213) occurrance
214) permanent ✓
215) privilege ✓
216) relief ✓
217) shephards
218) successor ✓
219) tragedy ✓
220) warranty ✓

Drill 13

241) admissable
242) apparent ✓
243) banquet ✓
244) canvass ✓
245) convenience ✓
246) definite ✓
247) encyclopedia ✓
248) foreign ✓
249) haphazzard
250) intercede ✓
251) library ✓
252) miscellaneous ✓
253) ommitted
254) perserverence
255) proffesor
256) replies ✓
257) siege ✓
258) sueing
259) triumph
260) weird ✓

Drill 21

401) abrupt ✓
402) advertisement ✓
403) assignment ✓
404) believable ✓
405) cashier ✓
406) corregated ✓
407) description ✓
408) envelope ✓
409) franchise ✓
410) height ✓
411) interfere ✓
412) liberal ✓
413) mortgage ✓
414) opposite ✓
415) persuade ✓
416) prophesy ✓
417) reveal ✓
418) since ✓
419) susceptible ✓
420) unanimous ✓

Drill 25

481) alignment ✓
482) attorneys ✓
483) bicycle ✓
484) committee ✓
485) critique ✓
486) disappear ✓
487) exceed ✓
488) gesture ✓
489) homogenized ✓
490) it's ✓
491) accelerate ✓
492) loose ✓
493) niece ✓
494) ~~pamphlet~~ pamphlet ✓
495) prairie ✓
496) pursue ✓
497) ridiculous ✓
498) sneak ✓
499) ~~technical~~ technical ✓
500) useful ✓

Mitt Jackson
6/9/86

#5 #13

acquittal ✓	1. advantagous	1. admissible ✓
apostrophe ✓	2. appointment ✓	2. apparent ✓
banana ✓	3. behavior ✓	3. banquet ✓
candidate ✓	4. career ✓	4. convent ✓
controlling ✓	5. correspondent ✓	5. convenience ✓
deficient ✓	6. delinquent ✓	6. definite ✓
embarass	7. enterprise ✓	7. encyclopedia ✓
flexible ✓	8. fourty	8. foreign ✓
handkerchief ✓	9. hectic ✓	9. haphazard
inflammable ✓	10. lien ✓	10. intercede ✓
legitimate ✓	11. modern ✓	11. library ✓
medicine ✓	12 opponent ✓	12. miscellaneous ✓
occurence	13. personnel ✓	13 omitted ✓
permanent ✓	14. pronunciation ✓	14 perseverance ✓
priveledge	15. restaurant ✓	15. professor ✓
relief ✓	16 simultaneous ✓	16 replies ✓
shepherds ✓	17 surprise ✓	17 seige
successful ✓	18 tyranny ✓	18 suing
tragedy ✓	19 whether ✓	19 triumph ✓
warranty ✓	20 you're ✓	20 weird ✓

#21

1. abrupt ✓	9. franchise ✓	17. reveal ✓
2. advertisement ✓	10. height ✓	18. sinne ✓
3. assignment ✓	11. interfere ✓	19. susceptable
4. believable ✓	12. libable ✓	20 unanimous ✓
5. cashier ✓	13 mortgage ✓	
6 corrugated	14. opposite ✓	
7 description ✓	15. persuade ✓	
8. envelope ✓	16 prophecy	

Ex. #25

1. alignment ✓
2. always ✓
3. bicycle ✓
4. committee ✓
5. critique ✓
6. disappear ✓
7. exceed ✓
8. gesture ✓
9. homogenized ✓
10. it's ✓
11. accelerate ✓
12. loose ✓
13. niece ✓
14. pamphlet
15. practice
16. pursue ✓
17. ridiculous ✓
18. sneak ✓
19. technical ✓
20. useful ✓

Shane Harris
June 9, 1986

DRILL 15

1) advantageous ✓
2) appointment ✓
3) behavior ✓
4) career ✓
5) correspondent ✓
6) delinquent ✓
7) surpass ✓
8) forty ✓
9) hectic ✓
10) lion ✓
11) reason ✓
12) opponent ✓
13) personnel ✓
14) pronunciation ✓
15) restaurant ✓
16) simultaneous ✓
17) surpass ✓
18) tyranny ✓
19) whether ✓
20) you're ✓

DRILL 11

acquittal ✓
apostrophe ✓
banana ✓
candidate ✓
controlling ✓
dishcloth ✓
embarrass ✓
flexible ✓
handkerchief ✓
inflammable ✓
legitimate ✓
medicare ✓
accurance
permanent ✓
privilege ✓
relief ✓
shepherds ✓
successor ✓
tragedy ✓
warranty ✓

DRILL 13

admissible ✓
apparent ✓
banquet ✓
canvass ✓
convenience ✓
definite ✓
encyclopedia ✓
foreign ✓
haphazard ✓
interests ✓
library ✓
miscellaneous ✓
omitted ✓
perseverance ✓
professor ✓
replies ✓
sieges ✓
suing ✓
triumph ✓
weird ✓

DRILL 21

abrupt ✓
advertisement ✓
assignment ✓
believable ✓
cashier ✓
corrugated ✓
description ✓
envelope ✓
franchise ✓
height ✓
interfere ✓
likable ✓
mortgage ✓
opposite ✓
persuade ✓
prophesy ✓
rival ✓
sines ✓
susceptible ✓
unanimous ✓

DRILL # 25

alignment ✓
attorneys ✓
bicycle ✓
committee ✓
criticize ✓
disappear ✓
excess ✓
gesture ✓
harassed ✓
it's ✓
accelerate ✓
loose ✓
nieces ✓
pamphlet ✓
prairie ✓
pursue ✓
ridiculous ✓
sneak ✓
technical ✓
useful ✓

Corderia
June 9th

#13 Spelling Test

1) admissible ✓
2) apparent ✓
3) banquet ✓
4) canvass ✓
5) convenience ✓
6) definite ✓
7) encyclopedia ✓
8) foreign ✓
9) haphazard ✓
10) intercede ✓
11) library ✓
12) miscellaneous ✓
13) omitted ✓
14) perseverance ✓
15) professor ✓
16) replies ✓
17) siege ✓
18) sueing
19) triumph ✓
20) wierd ✓

#21

1) abrupt ✓
2) advertisement ✓
3) asignment
4) believable ✓
5) chashier
6) corrugated ✓
7) description ✓
8) envelope ✓
9) franchise ✓
10) height ✓
11) interfere ✓
12) likeable ✓
13) mortage
14) opposite
15) persuade ✓
16) prophecy
17) reveal ✓
18) since ✓
19) susceptible ✓
20) unanimous ✓

#15

1) advantageous ✓
2) appointment ✓
3) behavior ✓
4) career ✓
5) correspondant ✓
6) delinquent ✓
7) enterprize ✓
8) Forty ✓
9) hectic ✓
10) lean ✓
11) modern ✓
12) opponent ✓
13) personnel ✓
14) pronunciation ✓
15) restaurant ✓
16) simultaneous ✓
17) surprise ✓
18) tiranny ✓
19) whether ✓
20) you're ✓

#14

1) acquittal ✓
2) apostrophe ✓
3) banana ✓
4) candidate ✓
5) controlling ✓
6) deficient ✓
7) embarrass ✓
8) flexible ✓
9) handkerchief ✓
10) inflammable ✓
11) legitimate ✓
12) mediocre ✓
13) occurrence ✓
14) permanent ✓
15) privilege ✓
16) relief ✓
17) sheperds ✓
18) successor ✓
19) tragedy ✓
20) warranty ✓

Carolina P.
June 9, '86

#25

1) alignment ✓
2) attourneys
3) bycicle
4) committee ✓
5) criticize ✓
6) disappear ✓
7) exceed ✓
8) gesture ✓
9) homogenised
10) it's ✓
11) accelerate ✓
12) loose ✓
13) niece ✓
14) pamphlet ✓
15) prairie ✓
16) persue
17) ridiculous ✓
18) sneak ✓
19) technical ✓
20) useful ✓

Drill 25 Amy

481. alignment ✓
482. attourneys
483. bycycle
484. committee ✓
485. criticize ✓
486. disapear
487. exceed ✓
488. gesture ✓
489. homogenised
490. its ✓
491. accellerate
492. loose ✓
493. niece ✓
494. pamphlet ✓
495. prarie
496. persue
497. radiculous ✓
498. sneek
499. technical ✓
500. useful ✓

Amy

Drill-21	Drill 11
401. Abrupt ✓	201. Acquittal
402. advertisement ✓	202. apostrophy
403. assignment ✓	203. banana ✓
404. believable	204. Candidate ✓
405. cashier ✓	205. controlling ✓
406. coregated	206. deficient ✓
407. description ✓	207. embarass
408. envelope ✓	208. flexable
409. franchise ✓	209. handkerchief ✓
410. freight	210. inflammable
411. interfere ✓	211. legitamate
412. likeable ✓	212. mediocre ✓
413. mortgage ✓	213. occurance
414. opposite ✓	214. permanent ✓
415. pursuade	215. priviledge
416. prophecy	216. relief ✓
417. reveal ✓	217. shepherds ✓
418. since ✓	218. successor
419. susceptable	219. tragedy ✓
420. unanimous ✓	220. warranty ✓

Drill 13

241 admissable
242. aparent
243. banquet ✓
244. canvass ✓
245. convenienced ✓
246. defenate
247. encyclopedica ✓
248. foriegn
249. haphazzard
250. interceble ✓
251. library ✓
252. miscellaneous ✓
253. omitted ✓
254. perseverance
255. profesor ✓
256. replies ✓
257. siege ✓
258 suing ✓
259. triumph ✓
260. wierd

Drill-15

281. adventageous ✓
282. apointment
283. behavior ✓
284. carear ✓
285. correspondent
286. delinquint
287. enterprise ✓
288. forty ✓
289. hectic
290. lean
291. modern ✓
292. oponent
293. personell
294. pronouncéation
295. restaurand ✓
296. simultaneous
297. surprise ✓
298. tyranny ✓
299 whether ✓
300. you're ✓

Pop Quiz Scores

Date: June 9th

	Drill # 11	Drill # 13	Drill # 13	Drill # 21	Drill # 25
Karl	17/20	14/20	19/20	17/20	19/20
Erika	17/20	17/20	18/20	17/20	18/20
Carey	19/20	20/20	20/20	20/20	20/20
Martin	19/20	19/20	17/20	15/20	16/20
Greg	12/20	13/20	13/20	14/20	12/20

Note: By multiplying by five both numbers (numerator and denominator) a percent figure - suitable for comparison - will be produced.

Shana Morris 6/18/86

bildschirm ✓
maedchen ✓
fussball ✓
klavier ✓
tastatur ✓
tafel ✓
apfel ✓
schule ✓
drucker ✓
rechner ✓
wienerschnitzel ✓
baum ✓
junge ✓
lehrer ✓
luftwaffe ✓
lufthansa ✓
maus ✓
zentralseinheit ✓
zucker ✓
kino ✓

20/20

Mike Jackman
6/17/86

1. bildschirm ✓
2 maedchen ✓
3. fussball ✓
4 Klavier ✓
5. tastatur ✓
6. tafel ✓
7. apfel ✓
8. ~~shule~~ schule ✓
9. drucker ✓
10 rechner ✓
11. wienerschnitzel ✓
12. baum ✓
13. junge ✓
14. lehrer ✓
15. luftwaffe ✓
16. lufthansa ✓
17. maus ✓
18. zentraleinheit ✓
19. zucker ✓
20. kino ✓

20/20

Liked:

- It improved my spelling (a little bit ☺)

HATE:

- When you have to get 100% and miss it by 1 word!!!

Caroline '86 (1)

Amy

The thing I enjoyed most was recieving 100 on my spelling the thing I liked least was when It took me a whole period to do one lesson.

I didn't mind the spelling exercises because I like spelling and it gave me a chance to do something besides Typing Tutor. What I liked best was the stickers and what I liked least was having arguments fight over it

Shana

I dont think this program has helped all that much. I really resent doing it in a computer class