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ABSTRACT

The basic education program designed by Method of Intellectual Development (MIND) Inc., was used with two samples of adults in an attempt to update their basic skills quickly and economically in a non-school environment. The two samples consisted of: 23 unemployed and underemployed males; and 24 females. Ages ranged from 17-24 years. The two groups were divided into high achievers and low achievers. The MIND program was offered three hours a day for twelve weeks. There were 90 hours each for communication skills and arithmetic skills. Three qualified teachers were used as monitors for reporting and analysing, and evaluating. The Stanford Achievement Test Intermediate II Battery and the Otis Quick Scoring Mental Ability Test Gamma were given before and after instruction. In most of the learning situations, the groups made significant gains; however, the results were not of the magnitude claimed by the developers of the MIND package. Subjective data showed positive changes in the behavior and attitudes of the trainees. (PT)

# canada NEWSTART program

## Some Results of Two Basic Skills Training Programs in a Rural Setting

by

Peter C. McGonnell

and

Alfred E. Morrison

# SOME RESULTS OF TWO BASIC SKILLS TRAINING PROGRAMS IN A RURAL SETTING

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TABLE OF CONTENTS

## List of Tables and Figures



Figure

## ABSTRACT

The basic education program designed by MIND Inc. was used with two samples of adults with low educational levels in an attempt to upgrade their basic skills quickly and economically in a nonschool environment. Test scores obtained before and after instruction were compared to evaluate the outcomes of training. In most of the learning situations, the groups made significant gains; however, the results were not of the magnitude claimed by the developers of the MIND package. Subjective data showed positive changes in the behavior and attitudes of the trainees.

# INTRODUCTION

Prince Edward Island NewStart, Inc., Human Resources Survey (1968) indicated that 61.1 percent of the males, and 41.21 percent of the females of Kings County, Prince Edward Island who were interviewed reportedly had grade eight or less education. Such a low educational level restricts employability and prevents them from obtaining training in most occupations. Thus the evidence indicates there is a need to provide these people with an efficient mechanism to upgrade their basic education skills.

Since undereducation results in insufficient literacy skills for vocational training and retraining, lower earning capacity, and higher rates of unemployment (Brice, 1966), it logically follows that the undereducated adult population need the capabilities that a good basic education program can offer them to increase their earning power. The obvious next step is to find a system or systems that better enable the person to handle the next stage whether it be vocational training or employment.

There is no evidence to indicate that present upgrading programs such as The Canadian federally funded and provincially operated Basic Training for Skill Development (BTSD) program are effective. Although they are supposedly adult-oriented, the methods employed are very similar to those in

the regular school system. It has been suggested that this method is inefficient in the time that it takes to upgrade this population. Secondly, since the undereducated adult has experienced consistent failure in the regular school setting, he has developed an aversion to the conventional system.

Recognizing general dissatisfaction with the current method, Prince Edward Island NewStart, Inc. attempted to investigate the usefulness of an individualized adult-oriented program that would upgrade the basic skills in a shorter time than either the regular school or current upgrading programs. An existing program which seemed to meet these requirements was one designed by MIND (Method of Intellectual Development) Inc. The MIND Inc. promoters stated that this program fostered learning through group interaction. They also claimed that the program allowed for individual differences and would provide the individual participant the opportunity to work independently. It was further claimed that MIND used a modified form of programmed learning as the basic teaching technique. The MIND program was claimed to upgrade trainees two to four grades and increase their IQ score 7-10 points in 180 hours.

Although MIND Inc. has sponsored studies (Ball, 1967a, 1967b, 1967c; Di Pierro and Pryor, 1968; Kline, 1969), only one independent study (Mollenkopf, 1969) could be found using

the MIND program. There is no evidence in these studies to support the claim (by the developers of the MIND package) of a two to four grade change and an increase in IQ score of 7-15 points. Since research with this program is still in its early stages, the claims are yet to be substantiated. It is, therefore, the purpose of this study to test these claims.

## METHOD

### SUBJECTS

#### STUDY 1

The twenty-three male subjects who were unemployed or underemployed were 17 to 24 years of age with a stated educational background of four to nine completed grades. They had a mean age of 20 years and a mean of seven years of stated formal schooling.

#### STUDY 2

Twenty-four females, 17 to 24 years of age, with a stated educational background of 2 to 10 completed grades, who also were unemployed or underemployed were selected for this study. They had a mean age of 21 years and a mean of seven years of stated formal schooling. All 47 participants in the program were residents of King's County, Prince Edward Island.

The male and female groups were each divided into high achievers (Group One) and low achievers (Group Two). The high achievers were those who received a score of above Grade six on the standardized achievement test. The MIND program was offered for three hours a day for twelve weeks. Of the 180 hours, there were 90 hours each for Communication and Arithmetic Skills. All subjects were tested prior to and upon completion of the program. The following description

of the MIND program and monitors (instructors) will more adequately indicate the process.

THE MIND PROGRAM:

The MIND Basic Educational program is divided into two subject areas: Mathematics and Language. The Language program is divided into two levels for each of which there is a separate textbook.

The first level textbook, called Basic Word Attack Skills, is designed to bring the trainee from illiteracy to Grade three. In this book, the primary objective is to teach trainees how to break down words using the phonetic approach. This textbook involves a considerable amount of intensive drilling.

The second level textbook is called Language Skill Development (LSD). This text supposedly takes the trainees from the Grade Three level to an achievement level in the vicinity of Grade ten. This emphasizes the functional vital skills of reading and comprehension rather than writing and syntax. Each of the Skill Groups in the text is composed of five parts:

1. Word Attack Skills
2. Vocabulary Skills
3. Reading Skills

4. Comprehension and Analysis Skills

5. Vocabulary Drill

At the end of each unit is a vocabulary power drill which tests the trainee on all the new words in that unit.

To supplement the reading program there is a series of tapes. Each trainee is equipped with one tape recorder, one headset, and a drill pad on which the vocabulary appears along with the four choices of words, one of which is the correct meaning for the particular vocabulary word which the trainee is supposed to learn and remember. The vocabulary tape enunciates to the trainee the material that appears on the power drill pads. The tapes are geared for slow presentation in the beginning but the speed of presentation increases as the trainee advances in his program. There is also an audio program for the prose selections. The trainees are able to take a tape that corresponds with the prose selection in the Language Skills Development textbook and listen to the tape while following along in the text and repeating the phrases after the narrator.

The mathematics program consists of two math textbooks. The basic text, Math Facts, is designed for trainees from illiteracy to Grade three. This book consists of practice in the four fundamental operations dealing with whole numbers. There is also some work on adding and subtracting money.

The second level textbook is referred to as Power Math and the work in this book proceeds from Grade 3+ to 9+ level. This text includes units of fractions, decimals, percentages, ratio and proportions, weights and measures, scales and graphs, and geometric figures.

Accompanying the Math textbook, is an audio program. This program consists of mental arithmetic drills which serve to strengthen the trainee's speed and accuracy in Mental Arithmetic. There is a series of tapes which begin with very elementary operations, concentrating first on addition and subtractions, then advancing to multiplication and division. The tapes advance not only in terms of content but also in terms of speed. This set of tapes take the place of homework as it provides the necessary drill work. The trainees listen to the tape and fill in a blank on a pad to answer the question being asked by the tape. After this kind of exercise, the trainees have answer keys to which they can refer and thereby correct their own work.

At the beginning of this course, none of the trainees were placed on the basic textbook because it was concluded that this was too elementary for the trainees. As the program progressed, however, it was discovered that the Power Math text was too advanced for some of the trainees. About one month passed before the more basic material could

be obtained. At that time some of the trainees dropped back to the basic math book, Math Facts. This meant that the low achieving group further divided into a group using the Power Math Text and a group using Math Facts. There were no changes made to accomodate the difficulties in language.

The material in both the language and math sections of the course is provided in such a way as to be self-instructional. All of the explanations and instructions are written right into the text and the only time the monitors are called upon to provide information is when the trainees cannot grasp the explanations or when they become confused on a problem and cannot find the solution. For the most part, the work is primarily group work. MIND Inc. advertised that this program would make allowances for individual trainees to work at their own level and speed. During the group work there is the opportunity for discussion on general topics, and the trainees can ask questions if they so desire, or bring up issues on topics in which they are interested. This group work encourages the trainees to seek help from one another before going to the monitors for assistance.

THE MONITORS:

By design, MIND Inc. does not use teachers in the conventional sense, assuming instead, that the textbooks and tapes are self-explanatory. Functionally, the monitors

are present to provide support and guidance to the trainees to new materials particularly in the audio component (Di Pierro and Pryor, 1968).

Although MIND Inc. suggested that qualified teachers were not necessary for the program to be successful, New-Start chose three professionally trained teachers as monitors because there was considerable reporting, analyzing, and evaluating to be done by them. The backgrounds of these monitors are presented in the following brief descriptions:

Monitor No. 1 in charge of the high achieving group of male trainees, was single and in her middle twenties, and was a native of Kings County. Her educational background consisted of two years of professional teacher training and seven years of teaching experience. She was the most experienced of all the monitors.

Monitor No. 2 in charge of the low achieving group of male trainees, was single and in her early twenties, and was also a native of the local area. She had her B.A. with a major in English and had one year of teaching experience. She had taught a special education (slow learners) class in an elementary school in Kings County prior to her employment with Prince Edward Island NewStart, Inc.

Monitor No. 3 in charge of the high achieving group of female trainees was the only one of the four who was not a native of the area. She had moved into Kings County about a year before this program began. She was in her twenties and just recently had been married. She had obtained her B.A. degree with a major in history, and had two years of teaching experience.

Monitor No. 4 in charge of the low achieving group of female trainees, was the youngest of the monitors, was a local resident, and was the only one who was not professionally trained. She had obtained her high school diploma with some secretarial courses and had taken one university credit. Prior to coming to work as a monitor on this program, she had worked as a governess.

These monitors were all provided with a week's orientation to MIND materials by a specialist from MIND Inc. They were initiated to the texts and equipment that were to be used in the program. They received a clear idea of what their roles would be and how their approach would differ from that of the traditional classroom. Besides this week of training, the monitors met weekly with the Head of the Basic Education Department at which time problems were worked out and new ideas on dealing with adults were discussed.

OBJECTIVES AND HYPOTHESES:

The goals of the basic skills training program in both studies were as follows:

1. To upgrade trainees in the area of Basic Education. The developers of the MIND program state that the trainee will rapidly increase his communication and arithmetic skills.

2. To improve intellectual functioning. This statement is also consistent with the proposed capability of the MIND materials.

3. To effect a positive change in trainees' attitudes toward learning. This individualized approach to learning hopefully turns what has been an unhappy association with the conventional system of educating people into a positive attitude toward learning.

4. To prepare the trainee for employment or further training. Hopefully this educational upgrading increases the possibility of this person obtaining stable employment or skill training.

HYPOTHESES:

$H_1$ Trainees' grade achievement, as measured by standardized achievement tests, will increase two or four

grades with 180 hours of instruction.

$H_2$ Trainee will show a tested I.Q. change of 7-10 points, as measured by standardized intelligence tests, with 180 hours of instruction.

$H_3$ The success factor inherent in an individualized and programmed course will lead to a new enthusiasm for learning.

$H_4$ Trainees will be qualified to function successfully in either employment or further training programs.

VARIABLES AND INSTRUMENTATION:

The following is a schema indicating the variables and measurement used. The Stanford Achievement Test, Intermediate 11 Battery (Kelly, Madden, Garner, & Rudman, 1964) and the Otis Quick Scoring Mental Ability Test, Gamma (Otis, 1954a) were administered in both Pre and Post testing. The tests were administered by trained testers in order to control for variables related to the administration of the tests.

| | | | |
|---|---|---|---|
| 1. | English Score | Stanford Achievement | Pre-Post |
| 2. | Mathematics Score | Stanford Achievement | Pre-Post |
| 3. | Intelligence Quotient | Otis Quick Scoring Mental Ability | Pre-Post |
| 4. | Attitude Toward Learning | Subjective Ratings by Monitors | During Program |
| 5. | Employment Status | Follow-up Evaluation | Post Training |

## RESULTS AND DISCUSSION - MALES

Although it has been clearly stated (Ball, 1967b, 1967c) that undereducated adults can be upgraded in 180 class hours, the equivalent of our academic grades in reading and arithmetic, and can increase their I.Q. score 7 to 10 points, the mean change scores (Table 1) do not indicate such a change.

The greatest mean change of the combined male groups (Table 1) was 3.1 grade levels which was affected in the Arithmetic Computation Subtest. The mean grade level change in this subtest was also present when the males were divided into Groups One and Two. Group One (Table 2) and Group Two (Table 3) had mean grade level changes of 3.6 ($P<0.01$) and 2.2 ($P<0.01$) respectively. Only in Arithmetic Computation did some of the trainees achieve a four grade level change (Table 4) and this can be attributed to the amount of time spent on tapes. Trainees preferred and spent more time on the math tapes than on the language tapes; furthermore, they could assess their improvement more readily than in language skills.

The combined groups (Table 1) showed a mean grade level change of 0.8 ($P<0.01$) in the paragraph meaning subtest with Group One having 1.0 ($P<0.01$) and Group Two having 0.6 ($P<0.05$) mean grade level changes. Two persons in

TABLE 1

Pre and post-testing results of the male trainees with groups one and two combined.

| Variable | N | Mean | Range | Standard Deviation |
|---|---|---|---|---|
| Pre Word Meaning | 23 | 5.8 | 3.5 to 9.0 | 1.7 |
| Post Word Meaning | 23 | 6.6 | 4.1 to 10.0 | 1.8 |
| Change Word Meaning | | .8** | 0 to 2.9 | |
| Pre Paragraph Meaning | 23 | 5.2 | 2.9 to 7.8 | 1.40 |
| Post Paragraph Meaning | 23 | 6.0 | 3.9 to 8.4 | 1.52 |
| Change Paragraph Mean. | | .8** | -.5 to 2.3 | |
| Pre Spelling | 23 | 5.5 | 3.1 to 9.2 | 1.6 |
| Post Spelling | 23 | 6.5 | 4.0 to 10.8 | 1.7 |
| Change Spelling | | 1.0** | -.8 to 3.2 | |
| Pre Language | 23 | 5.1 | 2.2 to 7.7 | 1.6 |
| Post Language | 23 | 5.5 | 3.1 to 7.7 | 1.5 |
| Change Language | | .4* | -.8 to 3.2 | |
| Pre Arithmetic Comp. | 23 | 6.2 | 3.7 to 8.8 | 1.4 |
| Post Arithmetic Comp. | 23 | 9.3 | 5.4 to 12.9 | 2.5 |
| Change Arithmetic Comp. | | 3.1** | 0 to 6.3 | |
| Pre Arithmetic Con. | 23 | 6.1 | 2.6 to 8.0 | 1.6 |
| Post Arithmetic Con. | 23 | 7.1 | 4.3 to 11.1 | 1.8 |
| Change Arithmetic Con. | | 1.0** | -.9 to 2.8 | |
| Pre Arithmetic A. | 23 | 7.7 | 3.8 to 11.1 | 2.3 |
| Post Arithmetic A. | 23 | 8.5 | 4.2 to 11.5 | 2.2 |
| Change Arithmetic A. | | .8** | -1.8 to 2.9 | |
| Pre Otis I.Q. | 23 | 80.5 | 68 to 108 | 10.6 |
| Post Otis I.Q. | 23 | 84.8 | 67 to 113 | 10.3 |
| Change Otis | | 4.3** | -13 to 12 | |

** $P<0.01$
* $P<0.05$

TABLE 2

Pre and Post-testing results of the male trainees in Group One

| Variable | N | Mean | Range | Standard Deviation |
|---|---|---|---|---|
| Pre Word Meaning | 12 | 7.0 | 4.1 to 9.0 | 1.37 |
| Post Word Meaning | 12 | 8.0 | 4.7 to 10.0 | 1.39 |
| Change Word Meaning | 12 | 1.0** | 0 to 2.9 | |
| Pre Paragraph Meaning | 12 | 6.2 | 3.8 to 7.8 | 1.11 |
| Post Paragraph Meaning | 12 | 7.2 | 4.9 to 8.4 | 0.95 |
| Change Paragraph Mean. | 12 | 1.0** | -0.5 to 2.3 | |
| Pre Spelling | 12 | 6.5 | 4.7 to 9.2 | 1.24 |
| Post Spelling | 12 | 7.4 | 6.0 to 10.8 | 1.44 |
| Change Spelling | 12 | 0.9* | -0.8 to 2.8 | |
| Pre Language | 12 | 6.3 | 3.4 to 7.7 | 1.16 |
| Post Language | 12 | 6.3 | 3.9 to 7.7 | 1.13 |
| Change Language | 12 | 0.0 | -0.7 to 1.6 | |
| Pre Arithmetic Comp. | 12 | 6.9 | 5.4 to 9.4 | 1.34 |
| Post Arithmetic Comp. | 12 | 10.5 | 7.1 to 13.9 | 2.30 |
| Change Arithmetic Comp. | 12 | 3.6** | 1.3 to 6.3 | |
| Pre Arithmetic Con. | 12 | 6.8 | 2.6 to 8.0 | 1.4 |
| Post Arithmetic Con. | 12 | 8.2 | 5.4 to 11.1 | 1.4 |
| Change Arithmetic Con. | 12 | 1.4** | -.3 to 2.8 | |
| Pre Arithmetic A. | 12 | 8.9 | 5.6 to 11.1 | 1.7 |
| Post Arithmetic A. | 12 | 9.6 | 7.4 to 11.5 | 1.3 |
| Change Arithmetic A. | 12 | 0.7 | 0 to 3.0 | |
| Pre Otis I.Q. | 12 | 88.1 | 74 to 108 | 9.2 |
| Post Otis I.Q. | 12 | 91.6 | 78 to 113 | 8.5 |
| Change Otis I.Q. | 12 | 3.5* | -13 to 9 | |

** $P < 0.01$
* $P < 0.05$

TABLE 3

Pre and Post-testing results of the male trainees

| Variable | Group Two N | Mean | Range | Standard Deviation |
|---|---|---|---|---|
| Pre Word Meaning | 11 | 4.5 | 3.5 to 5.4 | 0.74 |
| Post Word Meaning | 11 | 5.1 | 4.1 to 6.0 | 0.59 |
| Change Word Meaning | 11 | 0.6** | 0 to 1.9 | |
| Pre Paragraph Meaning | 11 | 4.2 | 2.9 to 5.3 | 0.87 |
| Post Paragraph Meaning | 11 | 4.8 | 3.6 to 6.5 | 0.89 |
| Change Paragraph Mean. | 11 | 0.6 | -0.3 to 1.7 | |
| Pre Spelling | 11 | 4.5 | 3.1 to 7.0 | 1.27 |
| Post Spelling | 11 | 5.6 | 4.0 to 7.6 | 1.36 |
| Change Spelling | 11 | 1.1** | -.3 to 2.9 | |
| Pre Language | 11 | 3.8 | 2.2 to 6.1 | .96 |
| Post Language | 11 | 4.5 | 3.1 to 7.7 | 1.2 |
| Change Language | 11 | 0.7** | -1.2 to 1.6 | |
| Pre Arithmetic Comp. | 11 | 5.4 | 3.7 to 7.1 | 1.13 |
| Post Arithmetic Comp. | 11 | 7.6 | 3.8 to 10.5 | 1.9 |
| Change Arithmetic Comp. | 11 | 2.2** | 0 to 3.4 | |
| Pre Arithmetic Con. | 11 | 5.5 | 2.6 to 7.3 | 1.5 |
| Post Arithmetic Con. | 11 | 5.9 | 4.3 to 8.0 | 1.4 |
| Change Arithmetic Con. | 11 | 0.4 | -0.9 to 2.0 | |
| Pre Arithmetic A. | 11 | 6.4 | 3.8 to 10.1 | 1.9 |
| Post Arithmetic A. | 11 | 7.2 | 4.2 to 11.5 | 2.4 |
| Change Arithmetic A. | 11 | 0.8* | -.9 to 2.9 | |
| Pre Otis I.Q. | 11 | 72.5 | 68 to 80 | 3.5 |
| Post Otis I.Q. | 11 | 77.5 | 67 to 86 | 6.4 |
| Change Otis I.Q. | 11 | 5.0** | -1 to 15 | |

** $P<0.01$
* $P<0.05$

Table 4

Male Groups on Stanford Achievement Test Results

Group 1

| Subject No. | Word Meaning | | | Paragraph M | | | Spelling | | | Language | | | Arithmetic Computation | | | Arithmetic Concepts | | | Arithmetic Applications | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pre | Post | D | Pre | Post | D | Pre | Post | D | Pre | Post | D | Pre | Post | D | Pre | Post | D | Pre | Post | D |
| 1 | 7.3 | 8.0 | +.7 | 6.6 | 7.5 | +.9 | 7.0 | 9.8 | +2.8 | 7.7 | 7.6 | -.1 | 6.3 | 10.5 | +4.2 | 6.8 | 7.6 | +.8 | 5.6 | 8.6 | +3.0 |
| 2 | 7.8 | 8.5 | +.7 | 7.8 | 7.3 | -.5 | 7.6 | 7.5 | -.1 | 5.7 | 7.3 | +1.6 | 6.6 | 11.7 | +5.1 | 7.6 | 9.5 | +1.9 | 10.6 | 10.1 | -.5 |
| 3 | 7.1 | 8.5 | +1.4 | 6.8 | 8.0 | +1.2 | 5.9 | 6.0 | +.1 | 6.3 | 6.0 | -.3 | 5.9 | 11.7 | +5.8 | 7.9 | 7.6 | -.3 | 10.6 | 9.6 | -1.0 |
| 4 | 6.0 | 7.6 | +1.6 | 5.6 | 6.9 | +1.3 | 4.7 | 6.8 | +2.1 | 5.9 | 6.9 | +1.0 | 5.4 | 11.7 | +6.3 | 6.6 | 7.6 | +1.0 | 8.0 | 9.1 | +1.1 |
| 5 | 7.6 | 8.8 | +1.2 | 6.0 | 7.2 | +1.2 | 6.7 | 6.7 | 0 | 5.7 | 5.0 | -.7 | 6.3 | 9.1 | +2.8 | 6.6 | 7.8 | +1.2 | 7.1 | 8.6 | +1.5 |
| 6 | 6.8 | 7.4 | +.6 | 5.0 | 7.3 | +2.3 | 6.2 | 7.6 | +1.4 | 5.6 | 6.7 | +1.1 | 8.8 | 12.2 | +3.4 | 7.8 | 8.8 | +1.0 | 10.1 | 8.3 | -1.8 |
| 7 | 8.8 | 10.0 | +1.2 | 7.3 | 8.4 | +1.1 | 7.1 | 6.3 | -.8 | 7.7 | 7.0 | -.7 | 5.9 | 12.2 | +6.3 | 7.3 | 8.5 | +1.2 | 9.1 | 10.1 | +1.0 |
| 8 | 5.4 | 6.6 | +1.2 | 5.4 | 7.2 | +1.8 | 4.7 | 7.0 | +2.3 | 6.2 | 5.9 | -.3 | 8.2 | 12.9 | +4.7 | 6.6 | 8.8 | +2.2 | 9.6 | 11.1 | +1.5 |
| 9 | 4.1 | 4.7 | +.6 | 3.8 | 4.9 | +1.1 | 2.2 | 4.1 | +1.9 | 3.4 | 3.9 | +.5 | 5.8 | 7.1 | +1.3 | 6.5 | 7.6 | +1.1 | 6.8 | 7.4 | +.6 |
| 10 | 7.1 | 7.5 | +.4 | 6.1 | 8.2 | +2.1 | 5.7 | 6.7 | +1.0 | 6.7 | 6.7 | 0 | 7.9 | 12.6 | +4.7 | 8.0 | 12.6 | +4.6 | 11.1 | 11.1 | 0 |
| 11 | 6.4 | 9.3 | +2.9 | 6.4 | 6.0 | -.4 | 9.2 | 10.8 | +1.6 | 7.3 | 7.7 | +.4 | 5.8 | 10.0 | +4.2 | 8.0 | 9.5 | +1.5 | 8.3 | 10.1 | +1.8 |
| 12 | 9.0 | 9.0 | 0 | 7.2 | 7.2 | 0 | 6.3 | 7.0 | +.7 | 6.3 | 5.6 | -.7 | 9.4 | 12.6 | +3.2 | 5.8 | 8.0 | +1.2 | 9.6 | 11.5 | +1.9 |
| | | | | | | | | | | Group 2 | | | | | | | | | | | |
| 13 | 4.2 | 5.1 | +.9 | 5.0 | 5.9 | +.9 | 3.7 | 4.5 | +.8 | 3.8 | 4.8 | +1.0 | 4.6 | 7.7 | -3.1 | 7.3 | 8.0 | +.7 | 8.6 | 9.1 | +.5 |
| 14 | 5.1 | 5.6 | +.5 | 3.2 | 4.4 | +1.2 | 3.1 | 4.1 | +1.0 | 3.2 | 3.9 | +.7 | 3.7 | 6.3 | +2.6 | 5.2 | 4.3 | -.9 | 4.9 | 6.3 | +1.4 |
| 15 | 5.4 | 5.7 | +.3 | 4.8 | 6.5 | +1.7 | 3.4 | 6.3 | +2.9 | 3.7 | 4.5 | +.8 | 6.0 | 8.4 | 2.4 | 7.3 | 6.6 | -.7 | 10.1 | 11.5 | +1.4 |
| 16 | 4.1 | 6.0 | +1.9 | 4.7 | 4.7 | 0 | 4.4 | 7.6 | +3.2 | 3.8 | 4.8 | +1.0 | 7.1 | 10.5 | +3.4 | 7.0 | 7.8 | +.8 | 7.7 | 10.6 | +2.9 |
| 17 | 3.9 | 4.7 | +.8 | 3.6 | 3.9 | +.3 | 3.4 | 4.0 | +.6 | 3.2 | 4.0 | +.8 | 2.9 | 4.6 | +1.7 | 4.6 | 4.6 | 0 | 3.8 | 4.4 | +.6 |
| 18 | 4.4 | 4.7 | +.3 | 4.8 | 5.3 | +.5 | 6.3 | 7.5 | +1.2 | 4.6 | 3.4 | -1.2 | 5.2 | 7.7 | +2.5 | 4.6 | 5.9 | +1.3 | 6.3 | 6.8 | +.5 |
| 19 | 5.4 | 5.4 | 0 | 4.5 | 4.3 | -.2 | 4.5 | 5.1 | +.6 | 3.9 | 4.9 | +1.0 | 5.4 | 5.4 | 0 | 2.6 | 5.4 | +2.8 | 5.1 | 4.2 | -.9 |
| 20 | 5.4 | 5.7 | +.3 | 4.6 | 5.0 | +.4 | 7.0 | 6.7 | -.3 | 6.1 | 7.7 | +1.6 | 6.3 | 9.6 | +3.3 | 6.8 | 7.3 | +.5 | 7.7 | 7.1 | -.6 |
| 21 | 3.5 | 4.1 | +.6 | 3.0 | 3.9 | +.9 | 3.6 | 4.0 | +.4 | 2.2 | 3.1 | +.9 | 3.8 | 3.8 | 0 | 4.9 | 4.6 | -.3 | 5.1 | 5.1 | 0 |
| 22 | 4.6 | 4.9 | +.3 | 5.3 | 5.0 | -.3 | 5.3 | 6.2 | +.9 | 3.6 | 4.6 | +1.0 | 6.3 | 8.2 | +1.9 | 5.4 | 5.4 | 0 | 6.5 | 7.4 | +.9 |
| 23 | 3.5 | 4.6 | +1.1 | 2.9 | 3.6 | +.7 | 5.0 | 5.3 | +.3 | 3.9 | 4.4 | + .5 | 4.4 | 6.6 | +2.2 | 2.6 | 4.6 | +2.0 | 4.9 | 6.6 | +1.7 |

Group Two had a change of more than two grade levels; no one in Group Two reached this level. Mollenkopf (1969), in an 80 hour program with MIND using the Stanford Achievement Test, Intermediate 11 Battery, showed a mean grade level change of 0.9 ($P<0.05$) for the paragraph meaning and 3.9 ($P<0.01$) for Arithmetic Computation. In this study (Mollenkopf, 1969) the participants mean pre-instructional grade level score was 8.5 for Paragraph Meaning and 8.2 for Arithmetic Computation. The ranges in pre-instructional testing were 5.0 to 12.9 and 6.0 to 11.7 respectively. Their years of formal schooling varied from 6 to 14 with a median of 12. This clearly indicates that the men in the Mollenkopf study were at a higher formal grade level and the same time one cannot conclude that these men had greater potential than those in the present study. There is no information such as I.Q. scores in the Mollenkopf study to use as a comparison of capability of the participants in the studies.

In Word Meaning, the mean grade level change of both groups of males was significant ($P<0.01$); however, neither of the mean increases reached a two grade level change. The disappointing results on this subtest could be due to the limited usefulness for these males of the Stanford Achievement Test (Intermediate 11) in measuring Word Meaning. Raw scores in this subtest range from 1 to 48, and trainees scores on the pretesting ranged from 9 to 40. As

a result, for those trainees at the upper end of the range on pre-test, the ceiling effect could restrict their capability for measured improvement. More importantly, the Language Skills Textbook created some difficulty particularly in the numerous instances of badly chosen meanings in the vocabulary studies, and in the confusing approach to word attack skills.

Although spelling was not included in the program, Groups One and Two had 0.9 (Table 2) and 1.1 (Table 3) respectively mean grade level changes in this subtest ($P<0.01$). Only three persons in Group One and two persons in Group Two had a change of more than two grade levels (Table 4) in the spelling subtest. These grade level increases in spelling should be considered an indirect effect on concentrated efforts in other areas.

The Language sbutests did not measure any direct input of the MIND program. As with the Spelling subtest, any significant improvement represented a spin-off from the MIND program rather than a direct effect of the program. The combined groups (Table 1) had a mean grade level change of 0.4 ($P<0.05$). In the Arithmetic Concepts subtesbs Group One (Table 2) had a 1.4 change ($P<0.01$) but Group Two (Table 3) had a 0.4 change which was not significant. In the Arithmetic Applications subtest, both

groups were significant ($P<0.05$). The Basic Education Staff reported that the MIND program offered considerable training in this field of computational skills. Therefore, the Arithmetic application subtest did sample a direct input from the MIND program.

The participants in the Mollenkopf study spent 80 hours in the classroom while the participants in the present study spent 180 hours in the program. The results of Group One (Table 2) which has the higher mean I.Q. score are quite consistent on both the Paragraph Meaning and Arithmetic Computation subtests with the results of Mollenkopf (1969). The mean change scores are almost identical in both subtests for both studies.

Expectations concerning improvements in the intellectual functioning were not met in this study. In each group significant increases were made in I.Q. scores, but these increases were not as large as those specified by MIND. The mean gains in I.Q. scores ranged from 3.5 for Group One ($P<0.05$) to 5.0 for Group Two ($P<0.01$). Seven of the males in Group One and three in Group Two increased their I.Q. score 7 to 15 points. It is interesting to note that on pre-testing only one male in Group One had an I.Q. score below 80, while only one of the males in Group Two had an I.Q. score above 80.

Statistically, persons receiving an I.Q. score of less than 80 on the Otis Quick-Scoring Mental Ability Test, are in the bottom 17 percent of the population (Otis, 1954b). Hence, it may not have been realistic to expect them to be able to meet the objectives of the MIND program in such a period of time. Table 4 shows that the males in Group One made consistently higher gains on the Stanford Achievement test, Intermediate 11 Battery, than did Group Two. It would seem that the degree of change on any of the subtests was closely related to I.Q.

Since the Otis Quick-Scoring Mental Ability Test (Beta) correlates highly with Paragraph Meaning (.77) and Word Meaning (.82) of the Stanford Achievement Test (Otis, 1954b), one could infer that the Gamma level (Otis, 1954a) correlates highly with both subtests. This indicates a strong verbal loading for this I.Q. test (Otis, Gamma). Hence, one would expect those with low grade equivalent scores to have low I.Q. scores. This, in fact, did happen.

## RESULTS AND DISCUSSIONS - FEMALES

The Pre and Post grade levels of the combined groups (Table 5) of the females were quite similar to the Pre and Post grade levels of the combined groups (Table 1) of the males (Figure 1). With the exception of the Arithmetic Computation subtests, in which both male groups and Group One of the females had more than a two grade level change, the changes were not of the two to four grades predicted by the developers of the MIND program. This was the only evidence in both studies to substantiate the claims by the MIND program?

The combined female groups (Table 5) reached significance on four of the seven subtests while the combined male groups (Table 1) reached significance on all seven subtests. On only one of these subtests (females) was the mean grade level change one or more grade levels (Arithmetic Computation = 1.5). Since the pre-instructional I.Q. scores of the combined male groups (80.5) and the combined female groups (78.4) were very close, this should not account for the greater grade level changes among the males. If the females had pre-instructional mean grade levels that were considerably higher than the males, this would probably explain the lower grade level changes of the females; but this is not so as the males (Table 1) have a higher

TABLE 5

Pre and Post-testing results of the female trainee with Groups One and Two combined

| Variable | N | Mean | Range | Standard Deviation |
|---|---|---|---|---|
| Pre Word Meaning | 24 | 5.6 | 3.5 to 7.8 | 1.37 |
| Post Word Meaning | 24 | 6.5 | 3.5 to 10.5 | 1.85 |
| Change Word Meaning | | .9** | -.7 to 4.5 | |
| Pre Paragraph Meaning | 24 | 5.5 | 2.6 to 7.8 | 1.46 |
| Post Paragraph Meaning | 24 | 5.5 | 2.6 to 8.4 | 1.74 |
| Change Paragraph Mean. | | 0.0 | -1.2 to 1.4 | |
| Pre Spelling | 24 | 6.9 | 2.8 to 12.2 | 2.64 |
| Post Spelling | 24 | 7.2 | 3.0 to 12.2 | 2.68 |
| Change Spelling | | .3* | | |
| Pre Language | 24 | 5.2 | 2.3 to 8.5 | 1.87 |
| Post Language | 24 | 5.5 | 2.1 to 8.0 | 1.80 |
| Change Language | | .3 | | |
| Pre Arithmetic Comp. | 24 | 5.9 | 2.6 to 11.7 | 2.37 |
| Post Arithmetic Comp. | 24 | 7.4 | 2.9 to 12.2 | 3.01 |
| Change Arithmetic Comp. | | 1.5** | -2.1 to 5.9 | |
| Pre Arithmetic Con. | 24 | 5.5 | 3.1 to 11.8 | 1.90 |
| Post Arithmetic Con. | 24 | 6.3 | 2.2 to 11.8 | 2.12 |
| Change Arithmetic Con. | | 0.8 | -1.2 to 2.7 | |
| Pre Arithmetic A. | 24 | 6.9 | 3.1 to 11.9 | 2.51 |
| Post Arithmetic A. | 24 | 7.3 | 3.8 to 11.5 | 2.32 |
| Change Arithmetic A. | | 0.4 | -.5 to 2.8 | |
| Pre Otis I.Q. | 24 | 78.4 | 64 to 93 | 7.93 |
| Post Otis I.Q. | 24 | 82.3 | 65 to 101 | 9.33 |
| Change Otis I.Q. | | 3.9** | -3 to 10 | |

** $P < 0.01$
* $P < 0.05$

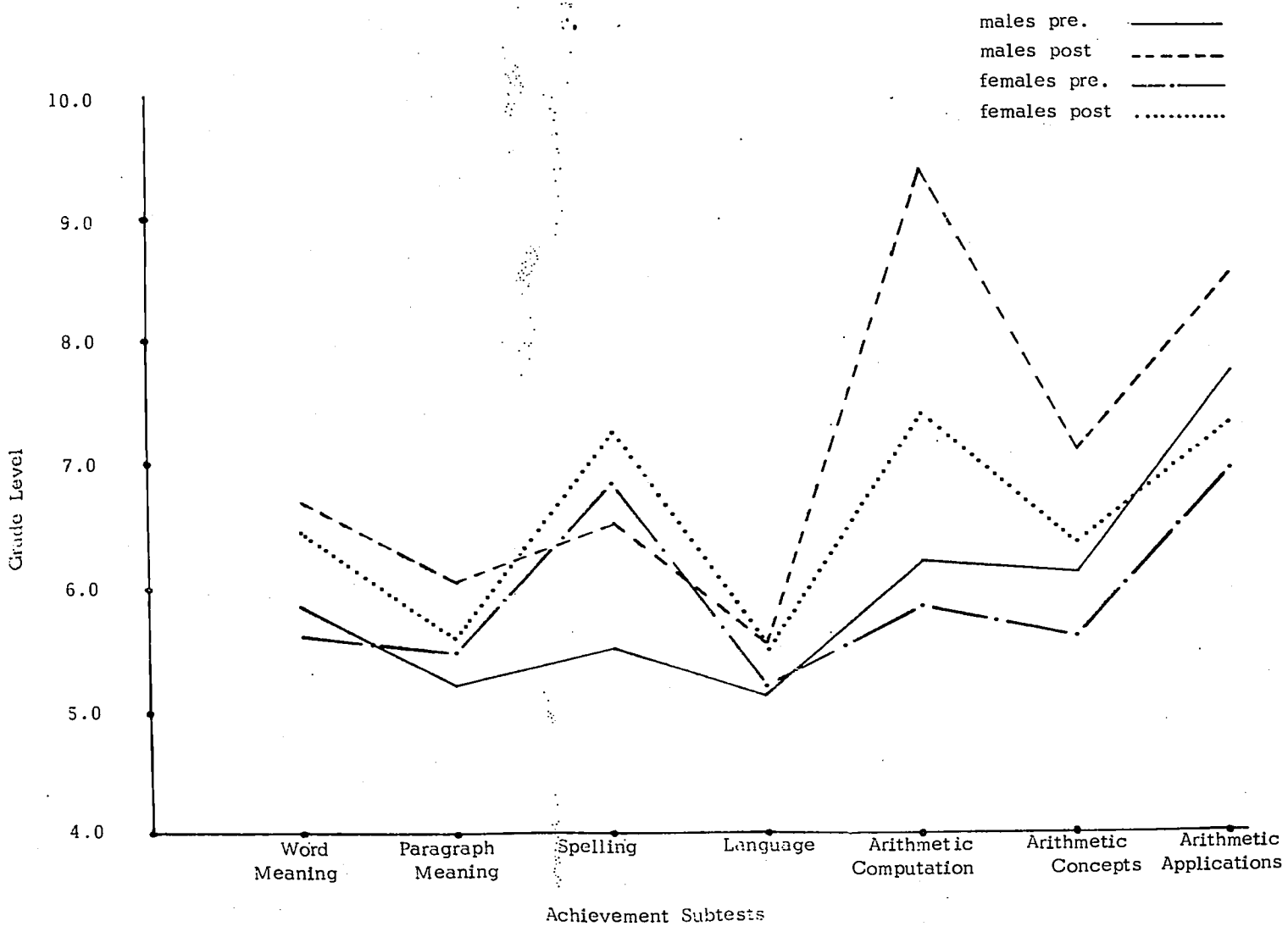


Fig. 1. Mean pre and post grade levels for males and females

pre-instructional mean grade level than the females (Table 5) on four of the seven subtests.

With the females there were significant mean grade level changes in Group one (Table 6) on Word Meaning, Arithmetic Computation and Arithmetic Concepts subtests and in Group two (Table 7) on Word Meaning, Spelling and Arithmetic Computation. Their counter parts in the male groups also had mean grade level changes that were significant on each of these subtests.

Statistically neither female group did as well as their counterpart male group. In Group One (females), on both the Spelling and Arithmetic Applications subtests, the pre-instructional mean grade levels were close to the ninth grade (Table 6). Since the MIND program had no direct input to be measured by the Spelling subtest, a lack of a significant change would be understandable for this subtest. But there is another explanation that could be posed for the non-significant results in the Spelling and Arithmetic subtests for this group. In an examination of Table 8, Group One had four persons obtaining a pre-instructional grade level score above 10.0 in both subtests. In the Spelling subtests the raw scores range from 1 to 56 with a raw score of 51 giving a grade score of 10.2. For such a person it is possible for him to increase his raw score

TABLE 6

Pre and Post-testing results of the female trainees

Group One

| Variable | N | Mean | Range | Standard Deviation |
|---|---|---|---|---|
| Pre Word Meaning | 12 | 6.5 | 4.7 to 7.8 | 1.02 |
| Post Word Meaning | 12 | 7.7 | 5.6 to 10.5 | 1.49 |
| Change Word Meaning | 12 | 1.2** | -0.7 to 4.9 | |
| Pre Paragraph Meaning | 12 | 6.5 | 4.9 to 7.8 | 0.94 |
| Post Paragraph Meaning | 12 | 6.9 | 5.4 to 8.4 | 0.98 |
| Change Paragraph Meaning | 12 | 0.4 | -0.8 to 1.4 | |
| Pre Spelling | 12 | 8.6 | 5.7 to 12.2 | 2.31 |
| Post Spelling | 12 | 8.8 | 5.4 to 12.2 | 2.6 |
| Change Spelling | 12 | 0.2 | -0.9 to 1.4 | |
| Pre Language | 12 | 6.5 | 4.3 to 8.5 | 1.4 |
| Post Language | 12 | 6.9 | 5.3 to 8.6 | 1.12 |
| Change Language | 12 | 0.4 | -0.9 to 2.5 | |
| Pre Arithmetic Comp. | 12 | 7.4 | 4.6 to 11.7 | 2.3 |
| Post Arithmetic Comp. | 12 | 11.0 | 8.6 to 12.9 | 1.3 |
| Change Arithmetic Comp. | 12 | 3.6** | .5 to 5.9 | |
| Pre Arithmetic Con. | 12 | 6.6 | 3.6 to 11.8 | 2.15 |
| Post Arithmetic Con. | 12 | 7.8 | 5.9 to 11.8 | 1.52 |
| Change Arithmetic Con. | 12 | 1.2** | -0.5 to 2.7 | |
| Pre Arithmetic A. | 12 | 8.8 | 6.3 to 11.9 | 2.0 |
| Post Arithmetic A. | 12 | 9.2 | 6.3 to 11.5 | 1.61 |
| Change Arithmetic A. | 12 | 0.4 | -1.3 to 2.8 | |
| Pre Otis I.Q. | 12 | 84.5 | 76 to 93 | 4.74 |
| Post Otis I.Q. | 12 | 89.2 | 73 to 101 | 7.48 |
| Change Otis I.Q. | | 4.7** | -3 to 10 | |

** $P < 0.01$
* $P < 0.05$

only by five. In the Arithmetic Application subtest the raw scores range from 1 to 39 with a raw score of 32 giving a Grade score of 10.1. Such a person could only increase his raw score by seven. This would indicate the ceiling effect was present in both of these subtests for persons having a grade score of over 10.0. Since there were only twelve persons in the Group, the lack of a significant differences in both subtests is understandable.

In Paragraph Meaning for the females, there was no significant change for either Group One (Table 6) or Group Two (Table 7) between pre and post-instructional testing. The contrast between the small but significant difference in each male group and the lack of a significant difference in each female group in this subtest suggests the need for an explanation. It is certainly quite possible that the males and females are not comparable groups. There may be basic differences in interests and values. The Basic Education instructors have concluded that the themes of the prose sections of the MIND materials are slightly oriented to male interests. Such an observation deserves serious consideration in the development of any adult basic education program.

The non-significant results with the females on the Language subtests probably have been due to the same

TABLE 7

Pre and Post-testing results of the female trainees

Group Two

| Variable | N | Mean | Range | Standard Deviation |
|---|---|---|---|---|
| Pre Word Meaning | 12 | 4.6 | 3.5 to 5.5 | 0.87 |
| Post Word Meaning | 12 | 5.2 | 3.5 to 6.4 | 1.12 |
| Change Word Meaning | 12 | 0.6* | -0.6 to 1.7 | |
| Pre Paragraph Meaning | 12 | 4.4 | 2.6 to 5.6 | .99 |
| Post Paragraph Meaning | 12 | 4.2 | 2.6 to 6.1 | 1.05 |
| Change Paragraph Mean. | 12 | -0.2 | 0 to 1.2 | |
| Pre Spelling | 12 | 5.1 | 2.8 to 6.8 | 1.4 |
| Post Spelling | 12 | 5.6 | 3.0 to 7.6 | 1.4 |
| Change Spelling | 12 | 0.5* | -0.6 to 1.4 | |
| Pre Language | 12 | 4.0 | 2.3 to 6.3 | 1.3 |
| Post Language | 12 | 4.2 | 2.1 to 5.9 | 1.14 |
| Change Language | 12 | 0.2 | -1.0 to 2.3 | |
| Pre Arithmetic Comp. | 12 | 4.1 | 2.6 to 5.4 | .77 |
| Post Arithmetic Comp. | 12 | 5.8 | 2.9 to 7.4 | 1.3 |
| Change Arithmetic Comp. | 12 | 1.7* | 0 to 3.0 | |
| Pre Arithmetic Con. | 12 | 4.5 | 3.1 to 5.4 | .68 |
| Post Arithmetic Con. | 12 | 4.7 | 2.2 to 6.6 | 1.4 |
| Change Arithmetic Con. | 12 | 0.2 | -1.2 to 2.3 | |
| Pre Arithmetic A. | 12 | 5.0 | 3.1 to 6.8 | 1.13 |
| Post Arithmetic A. | 12 | 5.4 | 3.8 to 6.6 | .96 |
| Change Arithmetic A. | 12 | 0.4 | -0.3 to 1.3 | |
| Pre Otis I.Q. | 12 | 72.3 | 64 to 80 | 5.45 |
| Post Otis I.Q. | 12 | 75.4 | 65 to 82 | 4.78 |
| Change Otis I.Q. | | 3.1* | -2 to 10 | |

** $P<0.01$
* $P<0.05$

Table 8

Female Groups on Stanford Achievement Test Results

Group 1

| Subject No. | Word Meaning | | | Paragraph M | | | Spelling | | | Language | | | Arithmetic C. | | | Arithmetic Con. | | | Arithmetic A. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pre | Post | D | Pre | Post | D | Pre | Post | D | Pre | Post | D | Pre | Post | D | Pre | Post | D | Pre | Post | D |
| 1 | 7.6 | 6.9 | -.7 | 5.0 | 5.9 | +.9 | 10.5 | 11.5 | +1.0 | 5.4 | 7.4 | +2.0 | 6.3 | 12.2 | +5.9 | 5.4 | 6.8 | +1.4 | 6.3 | 9.1 | +2.8 |
| 2 | 7.1 | 7.8 | +.7 | 6.5 | 6.2 | -.3 | 8.0 | 7.3 | -.7 | 7.0 | 7.7 | +.7 | 6.3 | 11.2 | +4.9 | 6.8 | 8.5 | +1.7 | 8.0 | 7.4 | -.6 |
| 3 | 7.3 | 8.3 | +1.0 | 7.5 | 6.7 | -.8 | 6.3 | 6.3 | 0 | 6.1 | 6.3 | +.2 | 6.2 | 10.5 | +4.3 | 5.2 | 6.8 | +1.6 | 8.3 | 8.0 | -.3 |
| 4 | 4.7 | 9.6 | +4.9 | 4.9 | 6.4 | +1.2 | 9.2 | 9.7 | +.5 | 5.8 | 5.3 | -.5 | 4.6 | 10.5 | +5.9 | 3.6 | 6.3 | +2.7 | 7.7 | 9.6 | +1.9 |
| 5 | 7.8 | 9.0 | +1.2 | 7.0 | 8.4 | +1.4 | 12.2 | 11.8 | -.4 | 7.9 | 8.6 | +.7 | 9.9 | 12.2 | +2.3 | 6.3 | 8.0 | +1.7 | 11.1 | 11.5 | +.4 |
| 6 | 5.1 | 7.5 | +2.4 | 6.0 | 6.4 | +.4 | 11.5 | 11.8 | +.3 | 8.0 | 7.6 | -.4 | 11.2 | 12.9 | +1.7 | 8.5 | 8.0 | -.5 | 11.9 | 10.6 | -1.3 |
| 7 | 5.5 | 5.6 | +.1 | 6.8 | 6.9 | +.1 | 6.9 | 6.0 | -.9 | 6.5 | 6.4 | -.1 | 11.7 | 11.2 | -.5 | 11.8 | 11.8 | 0 | 11.5 | 11.5 | 0 |
| 8 | 7.6 | 10.5 | +2.9 | 7.7 | 8.4 | +.7 | 11.5 | 12.2 | -.7 | 8.5 | 7.7 | -.8 | 7.9 | 12.2 | +4.3 | 7.8 | 8.2 | +.4 | 10.1 | 10.1 | 0 |
| 9 | 6.6 | 8.0 | +1.4 | 6.4 | 7.3 | +.9 | 8.0 | 8.8 | +.8 | 5.5 | 8.0 | +2.5 | 6.0 | 10.5 | +4.5 | 4.6 | 7.3 | +2.7 | 6.5 | 8.3 | +1.8 |
| 10 | 5.7 | 5.7 | 0 | 6.1 | 5.4 | -.7 | 6.0 | 5.9 | -.1 | 4.3 | 5.3 | +1.0 | 5.0 | 8.6 | +3.6 | 5.2 | 5.9 | +.7 | 6.3 | 6.3 | 0 |
| 11 | 6.8 | 7.1 | +.3 | 6.4 | 7.8 | +1.4 | 7.8 | 9.2 | +1.4 | 7.9 | 7.0 | -.9 | 6.5 | 10.5 | +4.0 | 7.3 | 8.5 | +1.2 | 10.1 | 9.6 | -.5 |
| 12 | 6.4 | 6.6 | +.2 | 7.8 | 7.5 | -.3 | 5.7 | 5.4 | -.3 | 5.0 | 5.5 | +.5 | 7.4 | 9.1 | +1.7 | 6.5 | 8.0 | +1.5 | 8.0 | 8.3 | +.3 |
| | | | | | | | | | | Group 2 | | | | | | | | | | | |
| 13 | 3.9 | 4.7 | +.8 | 3.9 | 3.8 | -.1 | 5.9 | 5.3 | -.6 | 3.0 | 5.3 | +2.3 | 4.4 | 5.9 | +1.5 | 4.3 | 5.4 | +1.1 | 5.4 | 5.1 | -.3 |
| 14 | 4.1 | 3.5 | -.6 | 3.4 | 4.1 | +.7 | 2.8 | 3.0 | +.2 | 2.3 | 3.8 | +1.5 | 3.7 | 4.1 | +.4 | 3.6 | 2.6 | -1.0 | 3.8 | 4.2 | +.4 |
| 15 | 3.5 | 5.2 | +1.7 | 4.7 | 4.2 | -.5 | 5.1 | 5.4 | +.3 | 2.8 | 4.0 | +1.2 | 4.0 | 6.3 | +2.3 | 4.3 | 6.1 | +1.8 | 4.6 | 5.6 | +1.0 |
| 16 | 3.9 | 4.2 | +.3 | 3.8 | 2.6 | -1.2 | 3.7 | 4.3 | +.6 | 3.6 | 3.4 | -.2 | 3.8 | 6.8 | +3.0 | 4.6 | 4.9 | +.3 | 6.3 | 5.9 | -.4 |
| 17 | 4.6 | 4.1 | -.5 | 3.6 | 4.6 | +1.0 | 4.7 | 5.4 | +0.7 | 3.1 | 2.1 | -1.0 | 5.0 | 5.0 | 0 | 4.6 | 4.3 | -.3 | 3.1 | 4.4 | +1.3 |
| 18 | 3.5 | 4.6 | +1.1 | 2.6 | 2.8 | +.2 | 3.1 | 3.6 | +.5 | 2.4 | 3.0 | +.6 | 2.6 | 2.9 | +.3 | 3.1 | 2.2 | -.9 | 3.8 | 3.8 | 0 |
| 19 | 5.5 | 5.2 | -.3 | 5.6 | 5.0 | -.6 | 4.5 | 5.9 | +1.4 | 3.5 | 4.3 | +.8 | 3.8 | 5.6 | +1.8 | 4.3 | 4.3 | 0 | 6.8 | 6.5 | -.3 |
| 20 | 5.5 | 5.2 | -.3 | 5.3 | 4.3 | -1.0 | 6.8 | 6.4 | -.4 | 4.5 | 3.7 | -.8 | 3.4 | 6.0 | +2.6 | 4.3 | 6.6 | +2.3 | 5.9 | 6.6 | +.7 |
| 21 | 5.5 | 6.4 | +.9 | 5.3 | 6.1 | +.8 | 6.7 | 6.7 | 0 | 5.9 | 5.8 | -.1 | 4.8 | 7.4 | +2.6 | 4.6 | 5.4 | +.8 | 5.6 | 6.6 | +1.0 |
| 22 | 5.1 | 6.6 | +1.5 | 5.2 | 5.2 | 0 | 5.9 | 6.6 | +.7 | 3.9 | 5.1 | +1.2 | 3.8 | 6.6 | +2.8 | 5.4 | 6.1 | +.7 | 4.2 | 4.9 | +.7 |
| 23 | 6.0 | 7.3 | +1.3 | 5.6 | 4.7 | -.9 | 6.4 | 7.6 | +1.2 | 5.6 | 6.9 | +.3 | 4.4 | 6.5 | +2.1 | 5.4 | 4.9 | -.5 | 5.7 | 5.7 | 0 |
| 24 | 4.7 | 5.7 | +1.0 | 3.9 | 2.9 | -1.0 | 5.6 | 7.0 | +1.4 | 6.3 | 4.2 | -2.1 | 3.7 | 6.6 | +2.9 | 5.2 | 4.0 | -1.2 | 5.4 | 4.9 | -.5 |

limitations of the measuring instrument and of the MIND program's lack of direct input in this part of communications skills. This explanation was also suggested in the male study.

The intelligence test scores (Table 5) indicate the combined female groups had a mean gain of 3.9 I.Q. points ($P<0.01$) with Group One (Table 6) having a higher mean gain than Group Two (Table 7). Only seven of the females (five in Group One and two in Group Two) increased their I.Q. score 7 to 15 points. Among the females two of the twelve participants had an I.Q. score below 80 on pretesting. Both Group One of the males (Table 2) and Group One of the females (Table 6) showed higher change scores than Group Two of the males (Table 3) and females (Table 7) in most subtests. It appears that the degree of change on any of the subtests was closely related to I.Q. scores.

Based on the findings on both the male and females studies it must be concluded that the MIND program did increase the grade level and I.Q. scores but not to the degree predicted by the developers of the MIND package. On the other hand since some participants in the program in certain Stanford Achievement subtests increased their grade level two to four grades ($H_1$) and did increase their I.Q. score 7 to 15 points ($H_2$), the hypothesis can be neither completely accepted nor rejected.

As there was no objective instrument to measure changes in enthusiasm for learning ($H_3$), subjective evidence is the only indicator for both males and females. The fact that both the Counselling and Basic Education Components were conducted in conjunction with one another makes it difficult if not impossible to separate the effects of each component on an attitudinal change toward learning. Attendance was consistently high for participants in both programs. This may be attributed to interest in the program, or to the fact that the participants received an allowance if they attended the program. The informal environment of the Basic Education component was far different from the conventional educational environment. Observations of the monitors indicated considerable interest in the program. Since the MIND program offered no direct input to and there was no objective measure of enthusiasm for learning, the observations are very subjective and probably do not support the hypothesis.

OBSERVATIONS AND CONCLUSIONS:

Both the male and female studies suffered in reaching immediate and ultimate objectives. Although both studies showed a general increase in communications and computational skills, both studies fell short of the immediate objective of demonstrating a substantial increase in these

basic skills. Most certainly the ultimate objective of manpower development is successful labor market placement and continued employment of the program participants. In the early stages of Prince Edward Island NewStart's development the company was not fully prepared for job development, placement and follow-up; but very quickly the company planned and developed these components. With the realization that new careers for the disadvantaged must be found, a number of participants in the program were placed in employment. The ultimate objective implicit at the beginning of the program soon became explicit. Every effort was made to place the persons in jobs or further training. For this reason, an evaluation of the program in terms of the number of participants successfully employed may be more an evaluation of the placement endeavour or of post-program economic environment than an evaluation of the effectiveness of the program.

It may be useful at this time to present the following two points. First the method of evaluating achievement gains in these studies should be examined. Perhaps the research design should have considered a more sophisticated analysis as suggested by Maginnis (1970) and Cronbach and Furby (1970). Secondly a token economy situation might be experimented with using adult subjects. The token reinforcement system has been tried and found effective with children (Wolf, Giles and Hall, 1968). There is every reason to

think that this system would be effective with adults.

RECOMMENDATIONS:

The MIND program should be used only with homogeneous groups in terms of grade levels and I.Q. scores. Experience in both these studies indicates that the range of differences should not be greater than two grades nor more than fifteen I.Q. points. This is indicative of the degree to which it is felt the program and instructional technique fail to allow for individual differences.

The math program is very well organized and appears to be very appropriate for adults. One good feature of it is the amount of drill work provided in both the audio and textual materials. It could be further improved by adding computational drills in fractions, decimals, and percent to the audio part of the program.

The language materials should be modified for a Canadian audience. This is particularly true of the prose selections and the many badly chosen meanings in the vocabulary studies. In the sections of the language program designed to develop comprehension and analytical skills, considerably more thought provoking questions should be added. Also we feel that a phonetic key approach would be much more effective if used in the section on the improvement of "vocabulary skills". Finally, the language program could be more

challenging and more responsive to individual needs if the word attack portions of the text were recorded on tape.

There are some minor technical features of the program which should be improved upon; namely (a) the faulty bindings of the text; (b) the numerous errors in the monitor's math answer key; (c) the alternating male and female voices on the tapes. The female voice was found to be very disconcerting to all groups of trainees.

The overall program is recommended for adults ranging from grade two to grade eight. It is not felt that the material is sufficiently challenging for those who test above the grade eight level although it is very adequate for review purposes.

Finally, in making a decision as to whether the MIND program should be adopted on a large scale, cost factor must be considered. The MIND materials for each trainee which are expendable are as follows:

| | | |
|---|---|---|
| 0.0 - 3.5 | - Basic Word Attack Test | $ 8.00 |
| | - Advanced Math Facts Test | 15.00 |
| 3.5 - 8.5 | - Power Math Text | 15.00 |
| | - Language Skills | 15.00 |

The hardware for the program required for a group of twelve; i.e. tape recorders, tapes and storage cabinet, costs approximately $2150.00. No figures are as yet

available for maintenance and depreciation costs of this hardward. Similarly, no figures are available for the potential per trainee hour cost of the hardware. Since each trainee is required to spend one half hour per day in each of math and language drill, it should not be too difficult to overcome problems of scheduling and space so that it would be possible for one set of hardware materials to service forty-eight trainees. The cost of the monitor's salary is also a factor but not one that will vary. It is felt that although little significant difference was recorded in the evaluation on the monitor variable, the monitor should have several years of university training and some teaching experience at the elementary or intermediate level. This kind of background will give indication of the per student cost in terms of salary. One monitor could easily manage two groups per six hour day and thus lower this cost.

The one factor that recommends the MIND program is essentially that the same results can be obtained in less time and with less effort than the conventional Adult Basic Education Program. Although the MIND program is more efficient, the relative significance of this factor must be determined by those who are responsible for curriculum design in any particular Adult Basic Education program.

Finally, it should be noted that this was a first generation NewStart project. Though continuing research modifications have been implemented in subsequent programs.

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