

## Summary Report

# AN EVALUATIVE STUDY OF PROJECT IMPACT

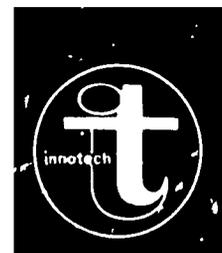
(Instructional Management by Parents,  
Community and Teachers)

OCTOBER 1977 and FEBRUARY-MARCH 1978

Funded by the International Development  
Research Centre (IDRC)  
Ottawa, Canada



Southeast Asian Ministers of Education  
Organization (SEAMEO)  
Regional Center for Educational Innovation  
and Technology (INNOTECH)



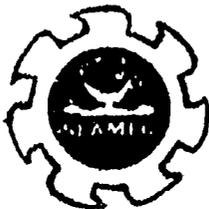
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## FOREWORD

Project IMPACT (Instructional Management by Parents, Community and Teachers) is INNOTECH's major research project on an economical and effective delivery of mass primary education. In Indonesia, the project is called Proyek PAMONG (Pendidikan Anak Oleh Masyarakat Orangtua Dan Guru).

Each project has been developed according to conditions peculiar to its own milieu based on the project design. The project undertaken in two countries, Indonesia and the Philippines, was funded by the International Development Research Centre (IDRC), Ottawa, Canada. The external evaluation of the project was likewise funded by IDRC.

Evaluation of the learning effectiveness of the IMPACT system through module posttests, block criterion tests, and regionally validated tests administered by the Project Staff and observations of pupil performance have yielded very encouraging results. However, to secure more conclusive evidence on the quality of learning that results from the use of the IMPACT delivery system, an external evaluation of Project IMPACT was undertaken in the school year 1977-1978. At the time, Project IMPACT was in its fourth year of implementation in Naga, Cebu, the original Philippine IMPACT site, while it was only in its first year of implementation in the two extension sites in the Philippines, Lapu-Lapu City and Sapang Palay, San Jose del Monte, Bulacan.

For this study, the level of pupil achievement under the IMPACT system and the conventional system as well as the extent of growth/gains in achievement under the two delivery systems had to be compared. Hence, evaluation was undertaken twice - the initial evaluation in October 1977 and the final evaluation in February-March 1978. The research findings are embodied in Part I and Part II, respectively, of the IMPACT evaluation report. This report integrates Part I and Part II of the said report. For more detailed data, reference may be made to the two separate reports.

To gather data that would be comparable to those obtained in the regular Philippine schools, SOUTELE (Survey of Outcomes of Elementary Education) instruments which were developed for Grades IV and VI pupils in Philippine government and private schools were used. These instruments were administered in IMPACT and Non-IMPACT schools by an external group -- a team of educational researchers from the Ministry of Education and Culture. Scoring of the tests and statistical treatment of the test results were done with the assistance of the University of the Philippines Computer Center.

Comparative data on pupil achievement in IMPACT and Non-IMPACT schools show favorable results for IMPACT. Furthermore, results of cost analysis studies have shown that the IMPACT system is much more economical since the cost of implementing and

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operating the IMPACT system is approximately only one-half the cost of implementing and operating the conventional system. Available evidence, therefore, indicates that Project IMPACT has achieved the purpose for which it has been designed: to develop an alternative delivery system of mass primary education that costs less without sacrifice of quality.

The very encouraging results of Project IMPACT/PAMONG have attracted the attention of Ministries of Education within and outside the Southeast Asian Region. The replication of IMPACT or the adaptation of some of its components is now being undertaken in Jamaica, Malaysia, and Liberia, among others. The adoption of PAMONG is a national goal in Indonesia as reflected in the country's five-year development plan. In the Philippines, an expanded tryout of the IMPACT system has been proposed to be undertaken in all the thirteen regions. Toward this end, the Ministry of Education and Culture held a series of seminar-workshops to prepare the field for the IMPACT expanded tryout.

The Southeast Asian Ministers of Education Organization (SEAMEO) Regional Center for Educational Innovation and Technology (INNOTECH) is pleased to present this report on the results of the initial evaluation in October 1977 and of the final evaluation in February-March 1978 of Project IMPACT.

  
LICERIA BRILLANTES SORIANO  
Director  
SEAMEO Regional INNOTECH Center

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## I. INTRODUCTION

### A. Background of the Study

Project IMPACT (Instructional Management by Parents, Community and Teachers) is being jointly undertaken by INNOTECH, the SEAMEO Regional Center for Educational Innovation and Technology and the Ministry of Education and Culture, Philippines. Proyek PAMONG (Pendidikan Anak Oleh Masyarakat Orangtua Dan Guru, as the project is called in Indonesia) is likewise jointly conducted by INNOTECH and the Ministry of Education and Culture, Indonesia. Each project has been developed according to conditions peculiar to its own milieu. The project undertaken in the two countries is funded by the International Development Research Centre (IDRC), Ottawa, Canada.

IMPACT, which is a "management system for mass primary education" is a major INNOTECH response to the need to develop an effective and economical delivery system for mass primary education. The "Development of an Effective and Economical Delivery System for Mass Primary Education"<sup>1</sup> is one of the four priority areas in the SEAMEO Educational Development Programmes for the 1970's. This came about because of the crucial problem identified by Southeast Asian educators: fewer than one-half of the children in the region were able to complete a six-year primary education and resources were not available to expand the conventional educational system to accommodate increased

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<sup>1</sup>SEAMES. SEAMEO Educational Development Programmes for the 1970's: Report of the Technical Working Group, Southeast Asian Ministers of Education Organization, Bangkok, July-August, 1972.

enrolments. If the need is to be met, an effective and economical delivery system would have to be developed. IMPACT may well be that needed alternative.

The IMPACT system is designed to have the following characteristics<sup>1</sup>:

- learning is self or group paced and progress is measured by achievement rather than by number of years in school;
- the curriculum has been integrated so that learning is not by subject and learning in one subject can support and reinforce that in others;
- the curriculum is that of the Ministry of Education and Culture, and it consists of a "core" learning sequence and an "advanced" learning sequence;
- the core curriculum is to be followed by all students since it provides for the development/acquisition of the basic skills, knowledge and attitudes that primary school leavers should have in order to become responsible members of their communities;
- the advanced curriculum is required of those who would enter secondary school; and advanced learning "modules" may be studied at any time after prerequisite learnings are required/achieved;
- all learning is modular, a module being a learning segment directed toward a specific educational objective which typically requires 3-5 hours to complete;
- for approximately the first 2 1/2 years, students learn in Programmed Teaching groups of 6-10 youngsters;
- Programmed Teachers are older primary students who are "programmed" to teach specific content in specific ways by following exact steps for each lesson;
- older primary students spend one hour each day as programmed teachers of primary school children;

<sup>1</sup>SEAMEO INNOTECH, Development of Learning Systems for the Rural Poor. Metro Manila, Philippines, October 1978, pp. 18-21.

- Programmed Teaching groups meet on the school grounds in small kiosks which are built of local materials by community members;
- voice models for English and Pilipino are provided for Cebu province through two half-hour educational radio broadcasts each day;
- after approximately 2 1/2 years of learning under Programmed Teaching, children move on to "transition modules" in preparation for peer group learning;
- transition learning is in peer groups under the guidance of an older student;
- peer groups are made up of children of heterogeneous ability so that democratic socialization can take place and so that the more able can assist those having difficulty;
- modules for transition learning are simply worded, but they have the same features as the modules used by older primary students, including: (a) readiness assessment/preparation, (b) purpose and objective of what is to be learned, (c) relevance and importance of module to student, (d) short instructional sequences followed by self-evaluation exercises and feedback, (e) review in preparation for posttests;
- in the last three years of primary education, learning takes place primarily in peer groups with students taking turns being group leaders;
- three hours daily are spent in peer-group learning with one additional hour for individual pursuits so that the more able students can study advanced modules while the less able can study the core modules of their group more thoroughly;
- groups enter into weekly contracts for those modules they intend to complete;
- group members who must be absent may study modules on their own, coming to the learning center to take posttests; receive guidance and get new modules for home study (this mode of learning is used almost exclusively for out-of-school youth);

- as group leaders, students follow guidelines prepared for each module to ensure that all children participate and that all of them achieve mastery before they take the posttests;
- posttests are given individually to children after completing each module to assess mastery and to indicate needed remediation;
- remediation is provided by tutors who usually are high school students assigned to the village, each student spending one day each month as a tutor;
- unpaid community members assist in the learning process by teaching specialized skills to groups of children usually in their own homes or on their farms;
- instructional aides assist in maintaining a library for modules, in keeping records and in administering and scoring posttests;
- itinerant teachers spend one-half day each week at a given village to instruct students in scouting, hygiene, sports, music and art;
- all instruction is under the management and guidance of an Instructional Supervisor who is responsible for the learning of 100 or more students;
- Instructional Supervisors do not teach (lecture); they are facilitators of learning activities;
- the primary responsibilities of Instructional Supervisors are (a) to visit learning groups regularly, (b) to identify individual and group needs, (c) to assist those in special need, (d) to assign tutors, peers and older students to help individuals with special learning needs, (e) to observe programmed teachers, transition guides, peer group leaders and tutors as a basis for improving their activities;
- learning takes place at the Community Learning Center (CLC) in the village; the CLC has replaced the school.

Project IMPACT/PAMONG was launched in 1974 in two sites - Naga, Cebu, Philippines and Solo, Central Java, Indonesia. The IMPACT site in Naga, Cebu consists of five villages and that in Solo, Indonesia, four villages. In 1977, the project was expanded from its original Naga, Cebu site in the Philippines to additional sites in Lapu-Lapu City, Mactan Island and in Sapang Palay, San Jose del Monte, Bulacan. Each field site is manned by a Project staff supervised by a National Steering Committee composed of senior Ministry of Education and Culture officials.

As may be inferred from the foregoing statements, the IMPACT system is designed to provide low-cost primary education to a greater number of children without sacrifice of quality. In other words, it is envisioned that while the cost of operating the IMPACT system would be much less than the cost of operating the conventional system, pupil achievement under the IMPACT system should be at least as high as that under the Non-IMPACT system. Evidence of the effectiveness of the IMPACT system, therefore, would be the manifestation of two essential characteristics: economy and learning effectiveness.

Cost analysis studies on IMPACT have been undertaken. A preliminary study was made on the original Philippine IMPACT site - Naga, Cebu in June 1977 by Mr. Tereso S. Tullao, Assistant Professor of Economics at De La Salle University. Prof. Tullao based his analysis on the framework earlier developed by Dr. Edita Tan, a professor of Economics of the University of the Philippines who was commissioned by INNOTECH to design a cost analysis and evaluation plan for Project IMPACT. The framework referred to is embodied in Dr. Tan's report entitled "A Design to Evaluate the Efficiency of Project IMPACT." A more comprehensive study was undertaken on the three Philippine IMPACT sites in July 1978 by

Mr. James McMaster, lecturer in Economics, Canberra College of Advanced Studies, Australia. The findings of both studies show that the cost of implementing and operating the IMPACT system is approximately one-half the cost of operating the traditional system. A synthesis of the findings of the studies of Dr. Edita A. Tan, Mr. Tereso S. Tullao and Mr. James McMaster prepared by the INNOTECH Research Division is presented in the INNOTECH publication, "Cost-Effectiveness Analysis of Project IMPACT for the Philippines".

To assess the learning effectiveness of IMPACT as implemented in the Philippines, an evaluative study was undertaken in School Year 1977-1978. To gather the necessary data, evaluation was undertaken twice - in October 1977 and again in February-March 1978.

Separate reports were prepared for the initial evaluation undertaken in October 1977 (Part I) and the final evaluation in February-March 1978 (Part II). This report integrates Part I and Part II of the IMPACT evaluation report.

B. Purpose of the Study

The main purpose of the study is to evaluate pupil achievement under the IMPACT system.

The specific questions for the October 1977 IMPACT evaluation are as follows:

1. What are the characteristics of IMPACT pupils?  
IMPACT teachers? IMPACT schools?
  - a. What are the characteristics of IMPACT pupils?
    - 1) What per cent of the IMPACT pupils are at the right age for the grade? underage? overage?
    - 2) What is the socioeconomic status of IMPACT pupils?
      - a) What is the educational attainment of their parents?
      - b) How often do the pupils speak English at home?  
How often do the pupils speak Filipino at home?
      - c) What is their average monthly family income?
    - 3) What is the level of pupil motivation as perceived by the teachers?
    - 4) In all the above aspects, how do IMPACT pupils compare with Non-IMPACT pupils?
  - b. What are the characteristics of the IMPACT teachers?
    - 1) What are the characteristics of IMPACT teachers with regard to age, years of teaching experience, civil status and educational attainment?

- 2) What is their degree of competence
    - a) in communicating with pupils in the dialect?
    - b) in using Filipino as medium of instruction?
    - c) in using English as medium of instruction?
  - 3) What is the attitude of IMPACT teachers toward educational innovations?
  - 4) In the above aspects, how do IMPACT teachers compare with Non-IMPACT teachers?
- c. What are the characteristics of IMPACT schools?
- 1) How adequate are the instructional materials and physical facilities in IMPACT schools?
  - 2) What is the attitude of IMPACT school administrators toward educational innovations?
  - 3) How do IMPACT schools compare with Non-IMPACT schools in the above aspects?
2. What is the level of academic achievement of IMPACT pupils?
- a. What is the level of academic achievement of Levels IV, V and VI IMPACT pupils in the Language Arts, Science, Mathematics, Social Studies and Work Education/Home Economics by levels of mental ability?
  - b. How does the achievement of IMPACT pupils compare with that of Non-IMPACT pupils in the aforementioned subject areas?

Following are specific questions for the IMPACT final evaluation in February-March 1978:

1. What is the attitude of IMPACT teachers and school heads toward educational innovations? How do IMPACT teachers and school heads compare with Non-IMPACT teachers and school heads in this aspect?
2. What is the level of pupil motivation in IMPACT schools as perceived by the teachers? How does the level of motivation of IMPACT pupils in February-March 1978 compare with their level of motivation in October 1977? How do IMPACT pupils compare with Non-IMPACT pupils in these aspects?
3. What is the level of academic achievement of IMPACT pupils?
  - a. What is the level of academic achievement of Levels IV, V and VI IMPACT pupils in the Language Arts, Science, Mathematics, Social Studies, and Work Education/Home Economics?
  - b. How does the achievement of IMPACT pupils compare with the achievement of Non-IMPACT pupils in the aforementioned subject areas?
4. What is the relationship between growth/gains in pupil achievement as measured by achievement tests and initial scores on these tests?
5. How do the growth/gains in achievement by subject area and level of IMPACT pupils with given initial scores compare with the growth/gains in achievement of Non-IMPACT pupils with the same initial scores?
6. What is the relationship between growth/gains in achievement and mental ability?

7. How do the growth/gains in achievement by subject area and level of IMPACT pupils with given mental ability test scores compare with the growth/gains in achievement of Non-IMPACT pupils with the same mental ability test scores?

### Hypotheses

The following hypotheses were tested:

1. There is no significant difference in the mean scores of IMPACT and of Non-IMPACT pupils in each subject tested in Levels IV, V and VI.
2. There is no significant difference in the mean scores in each subject tested of IMPACT and of Non-IMPACT pupils classified by levels of mental ability in Levels IV, V and VI.
3. There is no significant difference in the growth/gains in achievement by subject area and level of IMPACT and of Non-IMPACT pupils with the same initial achievement test scores.
4. There is no significant difference in the growth/gains in achievement by subject area and level of IMPACT and of Non-IMPACT pupils with the same mental ability test scores.

### C. Limitations of the Research

The findings of the study should be viewed in the light of the following limitations:

1. The IMPACT experiment was launched on different dates in the three Project IMPACT sites: on January 8, 1974 in Naga, Cebu; on December 30, 1976 in Lapu-Lapu City; and on January 13, 1977 in Sapang Falay, San Jose del Monte, Bulacan.

Therefore, while the findings in Naga, Cebu may reflect more fully the results of the IMPACT system, those for Lapu-Lapu City and Sapang Falay may reflect the effects of the IMPACT system as well as some carry-over effects of the conventional system.

2. The Non-IMPACT or control schools selected were those schools which were equivalent or comparable to the IMPACT schools relative to socioeconomic status of the community and/or size of enrolment.

To minimize the effects of possible differences in the mental ability of IMPACT and Non-IMPACT pupils a comparison of mean scores of the two groups in each subject was also made after the pupils were classified by levels of mental ability; i.e., IMPACT pupils of high mental ability were compared with Non-IMPACT pupils also of high mental ability, IMPACT pupils of average mental ability were compared with Non-IMPACT pupils of average mental ability, and IMPACT pupils of low mental ability were compared with Non-IMPACT pupils of low mental ability.

3. There are tests with low reliability coefficients as computed through Kuder-Richardson formula #20. It may be recalled that assumptions underlying the use

of the Kuder-Richardson formula #20 are as follows: the items in the test measure a single ability, the correlations between the items are all equal, and the items have equal variability. This formula tends to underestimate reliability when the test items sample a number of abilities.

Results of tests with low reliability coefficients were also subjected to statistical analysis but the results of the analysis should be interpreted with caution.

4. In the analysis of the linear relationship between growth/gains in achievement and initial scores, only data on pupils with both initial and final scores were used. Hence, in this analysis, the sample sizes are smaller than those used in testing the equality of means.
5. The interval between the initial testing and final testing was only from four to five months since the initial testing was undertaken in October 1977 and the final testing in February-March 1978. Therefore, not much growth/gains in achievement is expected because of the relatively short span of time involved.
6. Judgment on the relative effectiveness of the IMPACT system and the conventional system based on growth/gains in pupil achievement should be made in the light of strong research evidence that there is a negative correlation between pretest or initial test scores and gains in achievement.

To minimize the effects of this limitation, analysis of growth/gains in pupil achievement was done not through a direct comparison of the average gains for the two groups, IMPACT and Non-IMPACT,

but through tests of homogeneity and concurrence of regressions of the extent of growth/gains in achievement on initial scores for IMPACT and for Non-IMPACT, using the analysis of variance. This statistical technique takes into account the whole range of initial scores in the comparison of growth/gains in the achievement of IMPACT and Non-IMPACT pupils.

7. Many of the coefficients of determination ( $r^2$ )\* between gains in achievement and initial achievement test scores are very low. The lowest obtained coefficient is 0.01 and the highest, 0.79. This means that from 21 per cent to 99 per cent of the variation in growth/gains in achievement must be attributed to variables other than initial scores in achievement tests and that for subjects with very low  $r^2$  values, other types of curves may better fit the data. In other words, in subject areas in which the  $r^2$  values between growth/gains in achievement and initial achievement test scores are low, reliable comparisons using linear regressions cannot be made.

Comparisons were, however, made for some subjects with relatively low  $r^2$  values as well as those with moderate and high  $r^2$  values (0.16 to 0.79) in order to get general trends in the relative extent of growth/gains in the achievement of IMPACT and Non-IMPACT pupils.

One must, of course, be very cautious in the use of the regression equations in predicting gains of IMPACT and Non-IMPACT pupils and in estimating the difference in the growth/gains of the two groups, particularly in subjects with low and moderate  $r^2$  values.

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\* The coefficient of determination ( $r^2$ ), the square of the correlation coefficient,  $r$ , indicates the percentage of the variance of one variable which is accounted for by its correlation with a second variable.

8. The coefficients of determination ( $r^2$ ) between growth/gains in achievement and mental ability test scores were very low (0.0000 to 0.1024), indicating that linear regressions may not be appropriate to use.

Consequently, the comparison of growth/gains in the achievement of IMPACT and Non-IMPACT pupils having the same mental ability scores through the use of linear regressions was no longer undertaken.

## II. METHODOLOGY

### A. Subjects of the Study

The study included all the nine schools in the three Philippine Project IMPACT sites (Naga, Lapu-Lapu City and Sanang Palay) and seven Non-IMPACT schools deemed comparable to the IMPACT schools. The seven Non-IMPACT schools selected to constitute roughly the control group were comparable to the IMPACT schools in the following characteristics: socioeconomic status of the community and/or size of enrolment.

In October 1977, the subjects of the study consisted of 2,169 pupils (1,049 IMPACT and 1,120 Non-IMPACT), 68 teachers of these pupils (33 IMPACT and 35 Non-IMPACT), and 16 school heads (9 IMPACT and 7 Non-IMPACT) (Tables 1 and 2, Appendix A)..

The subjects of the February-March 1978 study included 2,096 pupils (1004 IMPACT and 1092 Non-IMPACT), 71 teachers of these pupils (31 IMPACT and 40 Non-IMPACT), and 15 school heads (9 IMPACT and 6 Non-IMPACT) (Tables 3 and 4, Appendix A).

There are differences in the number of pupils included in the study in the initial evaluation and final evaluation because some pupils who took the tests in October 1977 were unable to take the same tests in February-March 1978 and some pupils who took the tests in February-March 1978 had failed to take the same tests in October 1977.

## B. Instruments Used

For this evaluative study, the SOUTELE\* instruments were used.

Three types of research instruments - a non-verbal mental ability test, achievement tests and questionnaires - were used for this study.

### The Non-Verbal Mental Ability Test

A non-verbal mental ability test was developed for SOUTELE to minimize the effects of differences in proficiency in English or in any of the Philippine languages on test performance.

This 100-item test includes items on six types of mental processes, as follows:

<u>Mental Processes</u>	<u>No. of Items</u>
Association -----	10
Classification -----	30
Analogy -----	10
Visual Acuity -----	10
Spatial Relationships -----	10
Abstract Reasoning -----	<u>30</u>
TOTAL -	100

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\* SOUTELE is the acronym for "Survey of Outcomes of Elementary Education" in the Philippines. Project SOUTELE had two phases - the first known as SOUTELE I which was concerned with the assessment of learning outcomes in Grade VI (March 1975); and SOUTELE II, the assessment of learning outcomes in Grade IV (February 1976). The research instruments developed for SOUTELE I and SOUTELE II were used in the evaluation of Project IMPACT in order to have data that would be comparable to those obtained in the regular Philippine schools.

Description of the SOUTELE instruments, including the procedure followed in developing them and in determining their validity and reliability is given in Part I, the report on the October 1977 IMPACT evaluation.

### The Achievement Tests

These consist of objective-based multiple choice tests aimed at assessing the extent to which objectives in the different curriculum areas have been achieved.

The subject areas for which achievement tests were prepared with the corresponding number of items are as follows:

<u>Subjects Tested</u>	Number of Items	
	<u>Grade IV</u> (SOUTELE II)	<u>Grade VI</u> (SOUTELE I)
Language -----	40	70
Reading -----	35	40
<u>Wika</u> (Language in Filipino) -----	50	60
<u>Pagbasa</u> (Reading in Filipino)-----	40	50
Elementary Science -----	40	50
Elementary Mathematics -----	30	40
Social Studies -----	35	30
<u>Araling Panlipunan</u> (Social Studies in Filipino)---	35	
Work Education -----	35	30
<u>Edukasyong Panggawain</u> (Work Education in Filipino)--	35	
Home Economics -----		30

The SOUTELE II tests for Grade IV were administered to Level IV IMPACT and Non-IMPACT pupils while the SOUTELE I tests for Grade VI were administered to Level VI as well as Level V IMPACT and Non-IMPACT pupils.

### Questionnaires

Four SOUTELE questionnaires were administered to obtain the necessary information:

1. A questionnaire on school characteristics to be accomplished by the School Principal/Head Teacher/Teacher-in-Charge

2. A questionnaire on teacher characteristics to be accomplished by the teacher
3. The Pupil Information Sheet to be accomplished for every pupil tested by the Teacher-in-Charge or Class Adviser
4. A questionnaire on pupil characteristics to be accomplished by the pupil himself

For the IMPACT evaluative study, the SOUTELE instruments were administered twice - during the initial evaluation from October 11 to 28, 1977 and the final evaluation, from February 20 to March 22, 1978. The Non-Verbal Mental Ability Test was administered only during the October 1977 IMPACT evaluation.

During both the initial evaluation and final evaluation, the SOUTELE instruments were administered by an external group - a team composed of educational researchers from the Bureau of Elementary Education, Ministry of Education and Culture.

### C. Analysis of Data

Scoring of the tests was undertaken by the U.P. (University of the Philippines) Computer Center and the statistical treatment of test results, by the U.P. Computer Center and by INNOTECH. Processing and statistical treatment of questionnaire data were done by INNOTECH.

#### 1. Statistical analysis relative to test development

The following statistical measures were computed to determine how the achievement tests functioned among the examinees in IMPACT and Non-IMPACT schools included in the study:

- a. Biserial correlation to determine the discriminatory power of each item (item validity) for the Levels IV, V and VI pupils

- b. Percentage passing each item to determine item difficulty for the Levels IV, V and VI pupils
- c. Kuder-Richardson formula #20 to determine the reliability of the achievement tests
- d. Standard error of measurement to determine the reliability of an obtained score in each achievement test

2. Statistical analysis in the treatment of test results

In the analysis of the results of the evaluative study, the following statistical measures were computed/determined:

- a. Means and standard deviations of mental ability test scores to be used in determining cut-off points for mental ability levels
- b. Means, standard deviations and standard errors of the means for each subject and level by school, site and for the three sites combined
- c. Mean percentage scores by subject area to be used in preparing achievement profiles for each level by site and for the three sites combined for IMPACT and for Non-IMPACT
- d. Percentage of pupils passing each item to determine the nature of the pupils' learning difficulties
- e. t test for uncorrelated means to determine the significance of differences in the mean achievement test scores of IMPACT and Non-IMPACT pupils in each subject for each level
- f. The Pearson product moment coefficient of correlation ( $r$ ) to determine the relationship between growth/gains in achievement and initial scores in achievement tests and also between growth/gains in achievement and mental ability test scores

This was computed through the Hewlett-Packard 25 program on covariance and correlation coefficient.<sup>1</sup>

- g. Analysis of variance to test homogeneity and concurrence of regressions<sup>2</sup> of extent of growth/gains in achievement on initial scores in achievement tests for IMPACT and for Non-IMPACT, i.e., to compare the extent of growth/gains in the achievement of IMPACT pupils with that of Non-IMPACT pupils through the testing of two hypotheses:

- 1) Homogeneity (parallelism) of regressions
- 2) Homogeneity (concurrence) of positions

If the null hypothesis on parallelism of regressions is accepted, either of two situations is indicated:

- a) The regression lines of IMPACT and of Non-IMPACT coincide indicating that the gains of IMPACT and of Non-IMPACT are the same throughout the whole range of initial scores, or
- b) The regression of gains in achievement on initial scores in the achievement tests for one group (either IMPACT or Non-IMPACT) is higher than that of the other group throughout the whole range of initial scores.

There is therefore a need to test the occurrence of either (a) or (b) above. It is precisely for this purpose that the second hypothesis (concurrence of positions) is designed.

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<sup>1</sup>Hewlett-Packard Company, "Covariance and Correlation Coefficient", HP 25 Applications Programs, 1975, pp. 101-102.

<sup>2</sup>Evan Williams, Regression Analysis (New York: Wiley and Sons, Inc., 1959) pp. 133-137.

If the null hypothesis on parallelism of regressions is rejected, the test of homogeneity or concurrence of positions is no longer to be conducted for then the regression lines will intersect. In this case, the trend in the growth/gains in achievement will change at the point of intersection. For example, if IMPACT would show bigger gains before the regression lines reach the point of intersection, the trend would be reversed after the intersection point where Non-IMPACT would register bigger gains. The reverse would be true if Non-IMPACT would show bigger gains before the intersection point.

### III. FINDINGS OF THE STUDY

#### A. Characteristics of Pupils, Teachers and Schools

##### 1. On Pupils

Data on socioeconomic and related characteristics of pupils are presented in Tables 1-5. Reference may be made to Part I of the IMPACT evaluation report for more detailed data.

##### a. Age Characteristics of Pupils

For purposes of this study, pupils were considered at the right age for a level when at the opening of school in June their ages fell within these ranges:

Level IV - 9 years and 6 months to 10 years  
and 5 months

Level V - 10 years and 6 months to 11 years  
and 5 months

Level VI - 11 years and 6 months to 12 years  
and 5 months

Pupils who were below the given age range for a level were considered underage; those beyond or above the indicated age range, overage.

Table 1 shows that there are slightly bigger percentages of Non-IMPACT pupils than of IMPACT pupils who are underage and of the right age but bigger percentages of IMPACT pupils who are overage.

It is well to note, however, that differences in age are not crucial in studies of the primary (elementary) level in Philippine schools since there is an entrance age for Grade I which is seven years.

Table 1

Age Characteristics of Levels IV, V and VI  
 IMPACT and Non-IMPACT Pupils  
 (Data as of October 1977)

Age Characteristics	LEVEL IV		LEVEL V		LEVEL VI		TOTAL									
	IMPACT	NON-IMPACT	IMPACT	NON-IMPACT	IMPACT	NON-IMPACT	IMPACT	NON-IMPACT								
	N	%	N	%	N	%	N	%								
Underage	125	37.4	157	41.6	148	43.4	156	39.2	116	38.8	127	36.1	389	37.1	448	39.3
Of Right Age	150	36.7	142	37.7	101	29.6	133	33.4	97	32.4	121	35.1	348	33.2	396	35.4
Overage	134	32.7	78	20.7	92	27.0	107	26.9	86	28.8	92	26.7	312	29.7	277	24.7
No response							2	.5			5	1.4			7	.6
T o t a l	409	100.0	377	100.0	341	100.0	398	100.0	299	100.0	345	100.0	1049	100.0	1120	100.0

b. Educational Attainment of Family Heads

Data on the educational attainment of family heads of IMPACT and Non-IMPACT pupils are presented in Table 2.

As shown in Table 2, the educational attainment of family heads of Levels IV, V and VI IMPACT pupils ranges from no schooling to having earned the Master's or Professional degree; that of family heads of Non-IMPACT pupils in the three levels, from no schooling to having completed the medical course.

The median educational attainment of family heads of IMPACT as well as of Non-IMPACT pupils in the three levels tested is completion of elementary education.

The family heads of Level IV IMPACT pupils have higher educational attainment than family heads of Level IV Non-IMPACT pupils, as indicated by a higher percentage of Non-IMPACT family heads (73.2%) who finished at most elementary education, compared with a lower percentage for IMPACT family heads (64.4%). This indicates that a bigger percentage of IMPACT family heads had educational attainment beyond or higher than completion of the elementary grades.

In Levels V and VI, the educational attainment of family heads of IMPACT pupils is approximately the same as that of Non-IMPACT pupils.

Table 2

Educational Attainment of Family Heads of Levels IV, V and VI  
 IMPACT and Non-IMPACT Pupils  
 (Data as of October 1977)

Educational Attainment	LEVEL IV				LEVEL V				LEVEL VI				T O T A L			
	IMPACT N	NON-IMPACT %	NON-IMPACT N	IMPACT %												
Doctorate or Medical Prof.					1	.2									1	.1
Master's/Prof'l. degree			2	.5	2	.6	2	.5			3	.9	2	.2	7	.6
College graduate	10	2.4	4	1.1	6	1.8	5	1.3	7	2.4	13	3.8	23	2.2	22	2.0
Some Coll./Special- ized Voc'l. Training	23	5.6	11	2.9	16	4.6	23	5.8	13	4.3	15	4.3	52	5.0	49	4.4
Finished High School	50	12.2	35	9.3	51	15.0	47	11.8	60	20.1	40	11.6	161	15.3	122	10.9
Did not finish High School	59	14.4	45	11.9	34	10.0	53	13.3	58	19.4	84	24.3	151	14.4	182	16.3
Finished Elementary	107	26.2	96	25.5	92	27.0	127	31.9	84	28.1	74	21.4	283	27.0	297	26.5
Did not finish Elementary	152	37.2	168	44.5	108	31.6	96	24.1	60	20.1	112	32.5	320	30.5	376	33.6
No Schooling	4	1.0	12	3.2	26	7.6	37	9.3	13	4.3			43	4.10	49	4.4
No response	4	1.0	4	1.1	6	1.8	7	1.8	4	1.3	4	1.2	14	1.3	15	1.2
T o t a l	409	100.0	377	100.0	341	100.0	398	100.0	299	100.0	345	100.0	1049	100.0	1120	100.0

c. Frequency with which Pupils Speak Pilipino and English at Home

Data on the frequency with which pupils speak Pilipino and English at home are presented in Tables 3 and 4, respectively.

Responses of the Levels IV, V and VI pupils to the question, "Do you speak Pilipino at home?" indicate that bigger percentages of IMPACT than of Non-IMPACT pupils speak Pilipino "Often" and "All the time" in their homes. (Table 3)

Data on pupils' responses to the question, "Do you speak English at home?" are presented in Table 4. Data for Levels IV, V and VI indicate that among the pupils investigated, the number using English as their home language is minimal (1.5% IMPACT and 1.7% Non-IMPACT) and that from about three-fifths to four-fifths of the pupils investigated do not speak English at home.

Table 3

Frequency with which Levels IV, V and VI IMPACT and Non-IMPACT Pupils Speak Pilipino at Home\*

Responses	LEVEL IV		LEVEL V		LEVEL VI		T O T A L									
	IMPACT	NON-IMPACT	IMPACT	NON-IMPACT	IMPACT	NON-IMPACT	IMPACT	NON-IMPACT	IMPACT	NON-IMPACT						
	N	%	N	%	N	%	N	%	N	%						
No	219	53.6	182	48.3	142	41.6	132	33.2	83	27.7	129	37.4	444	42.3	443	39.6
Yes, sometimes	18	4.4	73	19.4	50	14.7	104	26.1	45	15.1	77	22.3	113	10.8	254	22.6
Yes, often	5	1.2	15	3.9	22	6.5	9	2.3	24	8.0	27	7.8	51	4.8	51	4.6
All the time	111	27.1	75	19.9	105	30.8	116	29.1	115	38.5	93	28.4	331	31.6	289	25.8
No response	56	13.7	32	8.5	22	6.4	37	9.3	32	10.7	14	4.1	110	10.5	83	7.4
T o t a l	409	100.0	377	100.0	341	100.0	398	100.0	299	100.0	345	100.0	1049	100.0	1120	100.0

Table 4

Frequency with which Levels IV, V and VI IMPACT and Non-IMPACT Pupils Speak English at Home\*

Responses	LEVEL IV		LEVEL V		LEVEL VI		T O T A L									
	IMPACT	NON-IMPACT	IMPACT	NON-IMPACT	IMPACT	NON-IMPACT	IMPACT	NON-IMPACT	IMPACT	NON-IMPACT						
	N	%	N	%	N	%	N	%	N	%						
No	330	80.7	268	71.1	285	83.6	277	69.6	190	63.6	216	62.6	805	76.7	761	68.0
Yes, sometimes	10	2.4	47	12.5	19	5.6	77	19.3	67	22.4	96	27.8	96	9.2	220	19.6
Yes, often	3	.7	22	5.8	10	2.9	4	1.0	6	2.0	14	4.1	19	1.8	40	3.6
All the time	7	1.7	7	1.9	5	1.5	6	1.5	4	1.3	6	1.7	16	1.5	19	1.7
No response	59	14.4	33	8.7	22	6.4	34	8.5	32	10.7	13	3.8	113	10.8	80	7.1
T o t a l	409	100.0	377	100.0	341	100.0	398	100.0	299	100.0	345	100.0	1049	100.0	1120	100.0

\*Data as of October 1977

d. Average Monthly Family Income

Table 5  
 Average Monthly Family Income of Levels IV, V and VI  
 IMPACT and Non-IMPACT Pupils  
 (Data as of October 1977)

Sites	LEVEL IV		LEVEL V		LEVEL VI	
	IMPACT	NON-IMPACT	IMPACT	NON-IMPACT	IMPACT	NON-IMPACT
Naga, Cebu	P261.40	P166.91	P263.39	P187.00	P326.42	P301.22
Lapu-Lapu City	405.16	344.33	413.80	394.28	440.50	401.22
Sapang Palay	556.14	271.13	300.80	348.93	361.11	396.24
Average Income for All Sites	P425.64	P279.95	P345.18	P367.05	P386.17	P384.12

For purposes of this study, the average monthly family income includes the combined earnings of the pupils' parents and unmarried brothers and sisters living in the same household.

As shown in Table 5, the average monthly family income of IMPACT pupils is higher than that of Non-IMPACT pupils except in Levels V and VI in Sapang Palay.

## 2. On Teachers

Data on teachers included in the study are presented in Tables 6-11. Data for each IMPACT site are given in Part I, the report on the October 1977 evaluation.

a. Age and Length of Teaching Service

Table 6

Age and Length of Teaching Service of  
IMPACT and Non-IMPACT Teachers  
Included in the Study  
(Data as of October 1977)

Variables	IMPACT (N=33)		NON-IMPACT (N = 35)	
	Mean	Standard Deviation	Mean	Standard Deviation
Age	35.12	10.32	34.84	8.13
Years of teaching service in present position	1.5	1.4	5.4	3.35
Total number of years in teach- ing service	10.5	9	8.9	5.1

As shown in Table 6, the IMPACT teachers were approximately of the same age as the Non-IMPACT teachers. While the average number of years of teaching service of IMPACT teachers was slightly higher than that of Non-IMPACT teachers, the Non-IMPACT teachers had longer experience in their present position.

c. Civil Status

Table 7

Civil Status of IMPACT and Non-IMPACT  
Teachers Included in the Study  
(Data as of October 1977)

Civil Status	IMPACT		NON-IMPACT	
	Number	Per Cent	Number	Per Cent
Single	11	33.3	11	31.4
Married	19	57.6	24	68.6
Widowed	3	9.1		
T o t a l	33	100.0	35	100.0

Table 7 shows that approximately one-third of IMPACT and of Non-IMPACT teachers were single.

c. Educational Attainment

Table 8

Educational Attainment of IMPACT and Non-IMPACT  
Teachers Included in the Study  
(Data as of October 1977)

Educational Attainment	IMPACT		NON-IMPACT	
	Number	Per Cent	Number	Per Cent
MA/MEd/MAT/MS/M Ped			1	2.9
Completed academic requirements for Master's degree			1	2.9
BSEEd/BSE + 30 or more units in MA	8	24.2	2	5.7
BSEEd/BSE + 15-29 units in MA	10	30.3	12	34.3
BSEEd/BSE + 1-14 units in MA	4	12.1	4	11.4
BSEEd/BSE	10	30.3	13	37.1
Below BSEEd/BSE	1	3.1		
No response			2	5.7
T o t a l	33	100.0	35	100.0

As shown in Table 8, 54.5 per cent of the teachers in IMPACT schools had earned at least 15 units toward the Master's degree; in Non-IMPACT schools, 45.8 per cent. With the exception of one teacher in the IMPACT group, all the teachers included in the study met the minimum educational qualification for teaching in the Philippine elementary schools - which is Bachelor of Science in Elementary Education (BSEEd).

d. Degree of Competence in the Use of the Dialect, Filipino and English

Table 9

Degree of Competence of IMPACT and Non-IMPACT Teachers in Communicating with Their Pupils in the Dialect  
(Data as of October 1977)

Degree of Competence	IMPACT		NON-IMPACT	
	Number	Per Cent	Number	Per Cent
Excellent	19	57.6	24	68.6
Good	13	39.4	11	31.4
Fair	1	3.0		
T o t a l	33	100.0	35	100.0

As shown in Table 9, all the teachers, both IMPACT and Non-IMPACT, rated themselves at least good (Good and Excellent) in communicating with their pupils in the dialect except one IMPACT teacher who considered himself only 'Fair' insofar as communicating with pupils in the dialect was concerned.

Table 10

Degree of Competence of IMPACT and Non-IMPACT Teachers in Using Pilipino as a Medium of Instruction (Data as of October 1977)

Degree of Competence	IMPACT		NON-IMPACT	
	Number	Per Cent	Number	Per Cent
Excellent	7	21.2	2	5.7
Good	19	57.6	28	80.0
Fair	5	15.2	3	8.6
Very little	2	6.0	2	5.7
T o t a l	33	100.0	35	100.0

Table 10 shows that 78.8 per cent of the teachers in the IMPACT schools considered themselves at least good in using Pilipino as a medium of instruction. The corresponding percentage for the Non-IMPACT teachers is 85.7. Approximately the same percentages, 6 per cent and 5.7 per cent for IMPACT and for Non-IMPACT, respectively, rated themselves as having "very little" competence in using Pilipino as a medium of instruction.

IMPACT and Non-IMPACT teachers were also asked to rate themselves on their degree of competence in the use of English as a medium of instruction.

Table 11

Degree of Competence of IMPACT and Non-IMPACT  
Teachers in Using English as a Medium of Instruction  
(Data as of October 1977)

Degree of Competence	IMPACT		NON-IMPACT	
	Number	Per Cent	Number	Per Cent
Excellent	6	18.2	6	17.1
Good	20	60.6	28	80.0
Fair	4	12.1	1	2.9
Very little	3	9.1		
T o t a l	33	100.0	35	100.0

Table 11 shows that 78.8 per cent of the IMPACT teachers considered themselves either good or excellent in using English as a medium of instruction. It is well to note that the same percentage of these teachers, 78.8 per cent, also rated themselves in the same way in using Pilipino as a medium of instruction (Table 10).

Among the Non-IMPACT teachers, a larger percentage, 97.1, rated themselves at least good in the use of English as a medium of instruction compared to those in the same group who considered themselves proficient in the use of Pilipino as a medium of instruction, 85.7 per cent (Table 10). This indicates that there were more Non-IMPACT teachers who considered themselves proficient in the use of English as a medium of instruction than Non-IMPACT teachers who considered themselves proficient in the use of Pilipino as a medium of instruction.

### 3. On Schools

In the October 1977 IMPACT evaluation, the school head respondents were asked to rate the adequacy of each given resource material in terms of the following categories: Very inadequate (VI), Inadequate (I), Barely adequate (BA), Adequate (A) and Very adequate (VA). NR was used for non-response and refers to an item to which the respondent failed to indicate his response.

Data for Very inadequate and Inadequate were combined to form the category VI/I and data for Adequate and Very Adequate, to A/VA. Thus, only four categories including that for non-response (NR) were used to simplify interpretation, as shown in Table 12.

Data in Table 12 indicate that school resource materials in IMPACT schools were more adequate than those in Non-IMPACT schools, particularly with regard to the following items: library readers, teacher's guides, lists of objectives, bulletins, supplementary readers, audio-visual materials and classroom equipment.

Table 12

Adequacy of School Resource Materials  
(Data as of October 1977)

Resource Materials	IMPACT (N=9)				NON-IMPACT (N=7)			
	VI/I	BA	A/VA	NR	VI/I	BA	A/VA	NR
<b>A. Library Resources</b>								
1. Readers	22.2		77.8		71.4	14.3	14.3	
2. References	22.2	44.4	33.3		100.0			
3. Current Periodicals	55.5	11.1	33.3		100.0			
<b>B. Instructional Materials</b>								
1. For Teachers' Use								
a. Courses of Study	11.1	33.3	44.4	11.1	42.8	28.6	28.6	
b. Teacher's Guides	11.1	11.1	77.8		14.2	42.9	42.9	
c. Resource/Teaching Units	11.1	11.1	55.6	22.2	28.6	57.1	14.3	
d. Lists of Objectives	11.1	11.1	66.7	11.1	14.2	42.9	42.9	
e. Bulletins		11.1	88.9		14.3	57.1	28.6	
2. For Pupils' Use								
a. Textbooks	22.2	11.1	55.6	11.1	85.7	14.3		
b. Supplementary Readers	33.3		66.7		100.0			
c. Workbooks	44.4	11.1	33.4	11.1	100.0			
d. School Magazines	22.2	44.4	33.4		100.0			
e. IS-OS Self-Learning Kits	11.1		55.6	33.3	42.9			57.1
f. Programmed Instructional Materials	11.1		33.3	55.6	42.9			57.1
<b>C. Teaching Aids</b>								
1. Audio-Visual Materials	33.3		66.7		85.7		14.3	
2. Laboratory Equipment	33.3	33.3	33.3		100.0			
3. Classroom Equipment	33.3		66.7		42.9	57.1		

N = Number of school heads who responded

B. School Personnel's Attitude Toward Educational Innovations

Data were obtained in October 1977 and in February-March 1978. Teachers and school heads were made to react to the same sets of statements about innovations. To the first set of statements, the respondents were to indicate their degree of agreement and to the second set, the degree of seriousness of each given constraint to the implementation of educational innovations.

Table 13 presents data on the percentages of teachers and school heads in IMPACT and Non-IMPACT schools agreeing or strongly agreeing to each statement about educational innovations in the IMPACT evaluation in February-March 1978 and in October 1977. In Table 13, data for October 1977 are in parentheses.

Teachers in IMPACT and Non-IMPACT schools had similar thinking relative to certain statements about innovations as shown by relatively small differences in the percentages agreeing or strongly agreeing to the given statements.

Examples of these statements based on results of the February-March 1978 evaluation follow:

Statements	IMPACT (n = 31)	Non-IMPACT (n = 40)
1. An innovation should first be tried out on a limited scale before it is implemented.	93.6	95
2. Changes should be made in the curriculum and administrative setup to make innovations fit more readily into the existing educational system.	90.3	90

The teacher respondents, however, differed in their thinking about certain statements as shown by the big differences in the percentages in the two groups agreeing or strongly agreeing to the following statements:

Statements	IMPACT (n = 31)	NON-IMPACT (n = 40)
1. Innovations are challenging and keep teachers enthusiastic and interested in their school work.	93.6	55
2. Innovations are better ways of solving recurring instructional problems.	93.6	60
3. Not enough copies of literature on innovations are given to the field.	48.4	95

On the whole, IMPACT teachers had a more favorable attitude toward innovations than the Non-IMPACT teachers as indicated by larger percentages of IMPACT teachers agreeing to most of the positive or favorable statements about innovations and smaller percentages of IMPACT than of Non-IMPACT teachers agreeing to most of the negative or unfavorable statements about innovations.

A similar trend may be noted among school heads, i.e., school heads in IMPACT schools seemed to have a more favorable attitude toward innovations than their counterparts in Non-IMPACT schools.

Table 13

Percentages of Teachers and School Heads in IMPACT and Non-IMPACT Schools Agreeing or Strongly Agreeing to Each Statement About Educational Innovations

(Data for February-March 1978 and for October 1977\*)

Statements	IMPACT		NON-IMPACT	
	Teachers N = 31 (N = 33)	School Heads N = 9 (N = 9)	Teachers N = 40 (N = 35)	School Heads N = 6 (N = 7)
1. Innovations improve administrative and instructional practices.	83.8 (100.0)	88.9 (88.9)	92.5 (85.7)	66.6 (71.4)
2. Teachers and school administrators will more readily accept innovations if they are given proper and adequate orientation.	93.6 (84.9)	100.0 (88.9)	97.5 (91.5)	100.0 (100.0)
3. An innovation should first be tried out on a limited scale before it is implemented.	93.6 (94)	66.7 (66.7)	95.0 (99.1)	100.0 (100.0)
4. Changes should be made in the curriculum and administrative setup to make innovations fit more readily into the existing educational system.	90.3 (94)	88.9 (77.8)	90.0 (97.1)	100.0 (100.0)
5. Schools are not interested in implementing innovations because funds are not provided for them.	38.7 (39.4)	33.3 (55.6)	47.5 (37.1)	50.0 (57.1)
6. Innovations are challenging and keep teachers enthusiastic and interested in their school work.	93.6 (90.8)	66.7 (77.8)	55.0 (62.8)	83.3 (57.1)
7. Innovations are better ways of solving recurring instructional problems.	93.6 (93.9)	88.9 (88.9)	60.0 (65.7)	66.6 (100.0)
8. Innovations give additional work to teachers.	71.0 (66.7)	44.4 (55.6)	60.0 (82.8)	33.3 (42.9)
9. Teachers do not have enough time to implement innovations because of an already crowded school program.	45.2 (27.2)	11.1 (33.3)	62.5 (62.9)	50.0 (28.6)
10. Innovations are being introduced so fast that their effects are not properly evaluated.	45.2 (33.4)	11.0 (66.7)	55.0 (68.5)	83.3 (100.0)
11. Not enough copies of literature on innovations are given to the field.	48.4 (54.6)	55.6 (55.6)	95.0 (77.1)	100.0 (85.7)
12. Innovations are being introduced so fast that they are not widely implemented.	45.2 (39.4)	55.6 (55.6)	65.0 (62.9)	66.6 (85.7)

\*Data for October 1977 are in parentheses.

Separate lists of constraints to the implementation of innovations were presented to classroom teachers and school heads. They were to indicate on the checklist the extent of seriousness of each constraint to the implementation of innovations in terms of the following categories: Not a Constraint, Not So Serious, Is Serious, Is Very Serious.

For each constraint, the number responding Is Serious and Is Very Serious were combined and the corresponding percentages for teachers and for school heads in IMPACT and Non-IMPACT schools determined. (Table 14)

Data in both the February-March 1978 evaluation and the October 1977 evaluation indicate that the consensus among the teachers and school heads in both IMPACT and Non-IMPACT schools was that lack of funds had been the most serious constraint to the implementation of innovations.

It is well to note, however, that the percentages considering the said constraint IS SERIOUS and IS VERY SERIOUS are much smaller in IMPACT than in Non-IMPACT schools. The same holds true with the other given constraints, i.e., smaller percentages of IMPACT teachers than of Non-IMPACT teachers considered each constraint to the implementation of innovations serious.

TABLE 14

Percentages of Teachers and School Heads in  
IMPACT and Non-IMPACT Schools Who Consider a Constraint  
to the Implementation of Innovations at Least Serious

(Data for February-March, 1978 and for October, 1977\*)

Constraints	IMPACT		NON-IMPACT	
	Teachers N = 31 (N = 33)	School Heads N = 9 (N = 9)	Teachers N = 40 (N = 35)	School Heads N = 6 (N = 7)
1. Lack of funds for innovations	48.39 (39.39)	22.22 (50.0)	77.50 (74.28)	83.33 (71.43)
2. Indifference of the community to innovations	35.48 (30.30)	22.22 (30.0)	52.50 (60.0)	33.33 (14.29)
3. Involvement of the school in too many community activities	22.58 (33.3)	11.11 (50.0)	47.50 (54.28)	33.33 (28.58)
4. Indifference of some members of the teaching staff to innovations	22.58 (21.21)	11.11 (40.0)	52.50 (34.28)	33.33 (0.00)
5. Insufficient school resource materials for use in implementation	22.58 (27.27)	0.00 (50.0)	65.00 (71.42)	50.00 (71.43)
6. Lack of proper and adequate orientation about the innovations among school officials and teachers	22.58 (6.06)	0.00 (20.00)	42.50 (51.42)	33.33 (28.57)
7. Inflexibility of prescribed school programs	16.13 (3.03)	0.00 (10.0)	61.29 (34.28)	0.00 (14.29)
8. Indifference of the principal and other school officials to innovations	16.13 (18.18)	22.22 (20.0)	52.50 (20.0)	33.33 (14.29)

\* Data for October 1977 are in parentheses.

C. Teachers' Perception of the Pupils' Level of Motivation

Psychological studies have shown that teacher perception of pupil motivation affects the effort exerted by a teacher. If a pupil is perceived by a teacher to be highly motivated, the latter tends to exert more effort to help the pupil learn. Information on teacher perception of pupil motivation will therefore be useful in the evaluation of system effectiveness.

To guide the teacher in making his assessment of each pupil's level of motivation in this evaluative study, a set of guidelines was provided. As indicated in these guidelines, the bases for determining level of pupil motivation include, among others, the pupil's interest in his school work, his academic standing, study and work habits, and the effort he exerts toward getting along with others.

A teacher was to rate a pupil in terms of any of the following categories: Very Low Motivation, Low Motivation, Moderate Motivation, High Motivation and Very High Motivation. Data for High Motivation and Very High Motivation were later combined (H & VH) and so with data for Low Motivation and Very Low Motivation (L & VL).

Table 15 shows that as of February-March 1978, the percentages of pupils perceived by their teachers to have from moderate to very high motivation were higher for IMPACT than for Non-IMPACT. In Level IV, the percentages of pupils in these categories were approximately 84 per cent for IMPACT and 77 per cent for Non-IMPACT; in Level V, 89 per cent for IMPACT and 70 per cent for Non-IMPACT; and in Level VI, 86 per cent for IMPACT and 77 per cent for Non-IMPACT.

Except in Level VI, the bigger decreases in percentages of IMPACT pupils with low and very low motivation (L & VL) from October 1977 to February-March 1978, as compared with those of Non-IMPACT pupils, reflect favorably on IMPACT. Moreover, it may be noted that even with the bigger decrease for Non-IMPACT in Level VI, the percentage of pupils with low and very low motivation in February-March 1978 was lower for IMPACT (14.50%) than for Non-IMPACT (23.35%) in this level.

Table 15

Levels of Motivation of Levels IV, V and VI IMPACT and  
Non-IMPACT Pupils as Perceived by Their Teachers  
in October 1977 and in Feb.-March 1978  
(Data in Percentages)

Levels of Motivation*	I M P A C T			N O N - I M P A C T		
	Oct. 1977	Feb.- Mar. 1978	D**	Oct. 1977	Feb.- Mar. 1978	D**
<u>Level IV</u>	(N=341)			(N=322)		
H and VH	18.48	14.66	-3.82	27.64	27.33	-.31
M	39.58	69.21	29.63	34.47	50.00	15.53
L and VL	41.94	16.13	-25.81	37.89	22.67	-15.22
TOTAL	100.0	100.0		100.0	100.0	
<u>Level V</u>	(N=284)			(N=341)		
H and VH	22.54	24.30	1.76	17.30	22.29	4.99
M	48.94	64.44	15.5	39.30	47.51	8.21
L and VL	28.52	11.26	-17.26	43.40	30.20	-13.2
TOTAL	100.0	100.0		100.0	100.0	
<u>Level VI</u>	(N=269)			(N=274)		
H and VH	33.83	20.82	-13.33	14.96	32.85	17.89
M	47.95	64.68	16.66	38.32	43.80	5.48
L and VL	18.22	14.50	-3.34	46.72	23.35	-23.37
TOTAL	100.0	100.0		100.0	100.0	

\*Legend:

H and VH = High and Very High

M = Moderate

L and VL = Low and Very Low

\*\*Difference (D) = Percentage in Feb.-Mar. 1978 minus  
percentage in October 1977

D. Academic Achievement

In the analysis of test results in the initial evaluation in October 1977, comparisons of mean scores of IMPACT and of Non-IMPACT by subject area and level were made for the three sites combined and for Naga, Cebu; in the final evaluation in February-March 1978, comparisons of mean scores of IMPACT and of Non-IMPACT for the three sites combined and for each site (Naga, Lapu-Lapu City, Sapang Palay) and a comparison of growth/gains in the achievement of IMPACT and of Non-IMPACT for Naga, Cebu.

A separate analysis was made for Naga, Cebu, the original IMPACT site, in the October 1977 evaluation and in the February-March 1978 evaluation because the IMPACT system was then in its fourth year of implementation in the said site. It was felt that the evaluation results in the original IMPACT site would more accurately reflect the effects of the IMPACT system than would the results in the extension sites where the IMPACT system was only in its first year of implementation when the study was undertaken.

Achievement tests were administered in the following subjects: Language, Reading, Wika (Language in Pilipino), Pagbasa (Reading in Pilipino), Science, Mathematics, Social Studies, Araling Panlipunan (Social Studies in Pilipino), Work Education, Edukasyong Panggawain (Work Education in Pilipino) and Home Economics.

In Level IV, the tests in two subjects, Social Studies and Work Education, were given in two languages, English and Pilipino. The Level IV pupils were allowed to take the tests in the language of their choice. For Levels V and VI, the tests in these two subjects were in English.

The test in Home Economics was administered only in Levels V and VI, since this subject is taught only at these levels.

Tables 5, 6 and 7, Appendix B, present data on the means and standard deviations of achievement tests administered in October 1977 to Levels IV, V and VI IMPACT and Non-IMPACT pupils for each school, site and for the three sites combined.

Tables 8 and 9, Appendix C, present data on the mean percentage scores of Levels IV, V and VI IMPACT and Non-IMPACT pupils in the initial evaluation in October 1977 by subject area for the three sites combined and for Naga, Cebu. Tables 10 to 13, Appendix C, present data on the mean percentage scores of these pupils in the final evaluation in February-March 1978.

The mean percentage score is obtained by dividing the mean score by the total number of items in the test and then multiplying the quotient by 100. This statistic may be used in comparing pupil achievement in the different subject areas when the number of items varies from one test to another.

The mean percentage scores were used in preparing the achievement profiles for IMPACT and for Non-IMPACT - Figures 1 to 6, Appendix G-1, for the initial evaluation in October 1977 and Figures 7 to 18, Appendix G-2, for the final evaluation in February-March 1978.

Comparisons were made in the mean scores of IMPACT and of Non-IMPACT by subject area and level for the three sites combined and for Naga, Cebu in the initial evaluation in October 1977; for the three sites combined and for each site (Naga, Lapu-Lapu City, Sapang Palay) in the final evaluation in February-March 1978.

Comparisons of the mean scores of IMPACT and of Non-IMPACT were also made after the pupils were classified by levels of mental ability. The classification was based on their scores on the non-verbal mental ability test.

For this purpose, the following means and standard deviations of all examinees (IMPACT and Non-IMPACT) in each level were used to determine the cut-off points for the levels of mental ability.

	Level IV	Level V	Level VI
Mean	37.74	42.70	47.60
Standard Deviation	11.94	12.41	12.66

The cut-off points were determined by taking .6 standard deviation on either side of the mean for the average level of mental ability; .6 standard deviation above the mean and beyond, for the high level; and .6 standard deviation below the mean and lower, for the low level.

Using these as guides, the range of scores for each mental ability level (Low, Average, High) in Levels IV, V and VI was determined, as follows:

#### Level IV

High	-	45 and above
Average	-	31 to 44
Low	-	30 and below

#### Level V

High	-	50 and above
Average	-	35 to 49
Low	-	34 and below

#### Level VI

High	-	55 and above
Average	-	40 to 54
Low	-	39 and below

Comparisons were then made in the achievement of IMPACT and of Non-IMPACT pupils belonging to the same mental ability level. Thus, Level IV IMPACT pupils of high mental ability were compared with Level IV Non-IMPACT pupils also of high mental ability; Level IV IMPACT pupils of average mental

ability with Level IV Non-IMPACT pupils also of average mental ability; and Level IV IMPACT pupils of low mental ability with Level IV Non-IMPACT pupils also of low mental ability. Similar comparisons were made for Levels V and VI.

In the comparison of means in the final evaluation in February-March 1978, classification of pupils by levels of mental ability was no longer done because the analysis of the October 1977 test results showed that even in subjects where the Non-IMPACT pupils of high mental ability scored significantly higher than IMPACT pupils of similar ability, the IMPACT pupils, taken as a whole, still had equal if not higher achievement than the Non-IMPACT pupils. Hence, there is no loss of information in the general findings when equality of means is tested without classifying pupils by levels of mental ability.

#### 1. Comparison of Mean Scores

In this report, results of comparisons of mean scores by level for the three sites combined and for Naga, Cebu in the initial evaluation in October 1977 and in the final evaluation in February-March 1978 will be presented. This will be followed by an analysis of the findings in the initial evaluation and final evaluation.

Data on the significance of differences between means\* of IMPACT and of Non-IMPACT by subject area

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\*In this report, a deviation or difference that is significant at or beyond the .01 level is referred to as "very significant" or "highly significant"; one significant at the .05 level or beyond but below the .01 level, "significant"; and one significant below the .05 level, "non-significant."

and level for the three sites combined and for Naga, Cebu in the February-March 1978 evaluation, including levels of significance in the October 1977 evaluation, are presented in Tables 16 to 21; similar data for the October, 1977 evaluation, in Tables 14 and 15, Appendix D. A separate analysis for each of the extension sites, Lapu-Lapu City and Sapang Palay, is embodied in Part II of the IMPACT evaluation report.

Tables 16, 17 and 18, Appendix E, present data on the significance of differences between means of IMPACT and of Non-IMPACT pupils classified by levels of mental ability in the October 1977 evaluation.

#### Level IV

##### Findings in the Initial Evaluation in October 1977

##### For the Three Sites Combined

Results in Level IV for the three sites combined indicate that in seven of ten subjects tested, the differences in mean scores were statistically significant; all in favor of IMPACT. The three other differences were non-significant.

Differences in mean scores were significant at the .05 level for Language and Work Education-Pilipino, in favor of IMPACT. This means that if the comparisons would be carried out a hundred times, in 95 of the occasions IMPACT pupils would surpass the Non-IMPACT pupils in the two aforementioned subjects. In other words, higher mean scores or better performance of the IMPACT pupils compared with that of the Non-IMPACT pupils on the two tests cannot be reasonably attributed to chance and that there are real differences in the achievement in Language and Work Education-Pilipino of IMPACT and of Non-IMPACT, with IMPACT having higher achievement.

Table 16

Significance of Differences Between Means of Level IV IMPACT and Non-IMPACT Pupils  
by Subject Area for the Three Sites Combined in February-March 1978,  
Including Levels of Significance for the October 1977 Evaluation

Subjects Tested* by Group	No. of Pupils Tested (n)	Mean ( $\bar{X}$ )	Standard Deviation (s)	Standard Error of the Mean ( $\frac{s}{\bar{X}}$ )	Standard Difference (D)	Standard Error of the Difference ( $\frac{s}{\bar{X}_2 - \bar{X}_1}$ )	t	Level of Significance**																																																																							
								Feb.-March 1978	October 1977																																																																						
1. Language (40) IMPACT	389	15.22	4.47	.23	.44	.36	1.24	NS	.05																																																																						
Non-IMPACT	349	14.28	5.28	.28						2. Reading (35) IMPACT	388	11.15	4.19	.21	.12	.32	.36	NS	NS	Non-IMPACT	343	11.03	4.46	.24	3. Wika (Language in Pilipino) (50) IMPACT	380	22.64	9.64	.50	1.27	.73	1.74	NS	.01	Non-IMPACT	342	21.36	10.00	.54	4. Pagbasa (40) IMPACT	389	17.50	8.36	.42	1.72	.61	2.80	.01	.01	Non-IMPACT	346	15.79	8.22	.44	5. Science (40) IMPACT	367	16.64	5.95	.31	.52	.46	1.14	NS	.01	Non-IMPACT	351	16.11	6.40	.34	6. Mathematics (30) IMPACT	380	9.16	2.92	.15	.08	.24	.32	NS	.01
2. Reading (35) IMPACT	388	11.15	4.19	.21	.12	.32	.36	NS	NS																																																																						
Non-IMPACT	343	11.03	4.46	.24						3. Wika (Language in Pilipino) (50) IMPACT	380	22.64	9.64	.50	1.27	.73	1.74	NS	.01	Non-IMPACT	342	21.36	10.00	.54	4. Pagbasa (40) IMPACT	389	17.50	8.36	.42	1.72	.61	2.80	.01	.01	Non-IMPACT	346	15.79	8.22	.44	5. Science (40) IMPACT	367	16.64	5.95	.31	.52	.46	1.14	NS	.01	Non-IMPACT	351	16.11	6.40	.34	6. Mathematics (30) IMPACT	380	9.16	2.92	.15	.08	.24	.32	NS	.01	Non-IMPACT	342	9.08	3.38	.18										
3. Wika (Language in Pilipino) (50) IMPACT	380	22.64	9.64	.50	1.27	.73	1.74	NS	.01																																																																						
Non-IMPACT	342	21.36	10.00	.54						4. Pagbasa (40) IMPACT	389	17.50	8.36	.42	1.72	.61	2.80	.01	.01	Non-IMPACT	346	15.79	8.22	.44	5. Science (40) IMPACT	367	16.64	5.95	.31	.52	.46	1.14	NS	.01	Non-IMPACT	351	16.11	6.40	.34	6. Mathematics (30) IMPACT	380	9.16	2.92	.15	.08	.24	.32	NS	.01	Non-IMPACT	342	9.08	3.38	.18																									
4. Pagbasa (40) IMPACT	389	17.50	8.36	.42	1.72	.61	2.80	.01	.01																																																																						
Non-IMPACT	346	15.79	8.22	.44						5. Science (40) IMPACT	367	16.64	5.95	.31	.52	.46	1.14	NS	.01	Non-IMPACT	351	16.11	6.40	.34	6. Mathematics (30) IMPACT	380	9.16	2.92	.15	.08	.24	.32	NS	.01	Non-IMPACT	342	9.08	3.38	.18																																								
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6. Mathematics (30) IMPACT	380	9.16	2.92	.15	.08	.24	.32	NS	.01																																																																						
Non-IMPACT	342	9.08	3.38	.18																																																																											

\*Number of test items in the parenthesis.

\*\*The significant differences are all in favor of IMPACT.

NS means not significant at the .05 level.

Table 16 (Cont'd.)

Subjects Tested* by Group	No. of Pupils Tested (n)	Mean ( $\bar{X}$ )	Standard Deviation (s)	Standard Error of the Mean ( $s_{\bar{X}}$ )	Difference (D)	Standard Error of the Difference ( $s_{\frac{\bar{X}_2 - \bar{X}_1}{2}}$ )	t	Level of Significance**	
								Feb.-March 1978	October 1977
7. Social Studies- English (35)									
IMPACT	224	9.91	3.51	.23					
Non-IMPACT	229	10.03	3.23	.21	-.12	.32	-.36	NS	NS
8. Araling Panlipunan (Social Studies in Pilipino) (35)									
IMPACT	146	12.60	4.53	.38					
Non-IMPACT	123	11.98	4.33	.39	.61	.54	1.13	NS	.01
9. Work Education- English (35)									
IMPACT	224	11.35	3.42	.23					
Non-IMPACT	231	10.68	3.48	.23	.67	.32	2.07	.05	NS
10. Edukasyong Pangkawain (35) (Work Education in Pilipino)									
IMPACT	146	15.99	4.21	.35					
Non-IMPACT	122	15.67	4.66	.42	.31	.54	.58	NS	.05

\*Number of test items is in the parenthesis.

\*\*The significant differences are all in favor of IMPACT.

NS means not significant at the .05 level.

Table 17

Significance of Differences Between Means of Level V IMPACT and Non-IMPACT Pupils  
by Subject Area for the Three Sites Combined in February-March 1978,  
Including Levels of Significance for the October 1977 Evaluation

Subjects Tested* by Group	No. of Pupils Tested (n)	Mean ( $\bar{X}$ )	Standard Deviation (s)	Standard Error of the Mean ( $s_{\bar{X}}$ )	Differ- ence (D)	Standard Error of the Dif- ference ( $s_{\frac{\bar{X}_2 - \bar{X}_1}{2}}$ )	t	Level of Significance**	
								Feb.-March 1978	October 1977
1. Language (70)									
IMPACT	326	20.28	4.56	.25					
Non-IMPACT	373	20.47	4.90	.25	-.19	.36	-.52	NS	NS
2. Reading (40)									
IMPACT	326	11.34	3.37	.19					
Non-IMPACT	373	10.66	3.45	.18	.68	.25	2.64	.01	NS
3. Wika (Language in Filipino) (80)									
IMPACT	313	27.12	10.58	.60					
Non-IMPACT	369	24.51	9.37	.49	2.61	.76	3.41	.01	.05
4. Pagbasa (50)									
IMPACT	324	19.16	7.24	.40					
Non-IMPACT	374	17.82	7.03	.36	1.33	.54	2.47	.05	.05
5. Science (50)									
IMPACT	309	16.81	5.36	.31					
Non-IMPACT	383	16.36	4.42	.23	.45	.37	1.22	NS	.01
6. Mathematics (40)									
IMPACT	308	10.65	3.31	.19					
Non-IMPACT	382	10.97	3.13	.16	-.32	.25	-1.30	NS	.01

\*Number of test items is in the parenthesis.

\*\*The significant differences are all in favor of IMPACT.

NS means not significant at the .05 level.

Table 17 (Cont'd.)

Subjects Tested* by Group	No. of Pupils Tested (n)	Mean ( $\bar{X}$ )	Standard Deviation (s)	Standard Error of the Mean ( $s_{\bar{X}}$ )	Differ- ence (D)	Standard Error of the Dif- ference ( $s_{\bar{X}_2 - \bar{X}_1}$ )	t	Level of Significance**	
								Feb.-March 1978	October 1977
7. Social Studies- English (30)									
IMPACT	309	9.18	2.91	.16	-.08	.23	-.34	NS	NS
Non-IMPACT	383	9.26	3.04	.16					
8. Work Education (30)									
IMPACT	146	8.96	2.30	.23	-.32	.29	-1.10	NS	NS
Non-IMPACT	183	9.28	2.48	.18					
9. Home Economics (30)									
IMPACT	171	9.95	3.23	.25	.24	.36	.66	NS	NS
Non-IMPACT	178	9.71	3.51	.26					

\*Number of test items is in the parenthesis.

\*\*The significant differences are all in favor of IMPACT.  
NS means not significant at the .05 level.

Table 18

Significance of Differences Between Means of Level VI IMPACT and Non-IMPACT Pupils  
by Subject Area for the Three Sites Combined in February-March 1978,  
Including Levels of Significance for the October 1977 Evaluation

Subjects Tested* by Group	No. of Pupils Tested (n)	Mean ( $\bar{X}$ )	Standard Deviation (s)	Standard Error of the Mean ( $s_{\bar{X}}$ )	Differ- ence (D)	Standard Error of the Dif- ference ( $s_{\bar{X}_2 - \bar{X}_1}$ )	t	Level of Significance**	
								Feb.-March 1978	October 1977
1. Language (70) IMPACT	284	22.30	5.59	.33	.88	.46	1.92	NS	.01
Non-IMPACT	335	21.41	5.83	.32					
2. Reading (40) IMPACT	284	12.25	4.12	.24	.07	.34	.20	NS	.01
Non-IMPACT	333	12.18	4.20	.23					
3. <u>Wika</u> (Language in Filipino) (60) IMPACT	274	29.70	11.25	.68	2.86	.85	3.36	.01	.01
Non-IMPACT	338	26.84	9.85	.54					
4. <u>Pagbasa</u> (50) IMPACT	283	21.28	8.40	.50	1.39	.66	2.09	.05	.01
Non-IMPACT	336	19.89	8.05	.44					
5. Science (50) IMPACT	266	19.20	6.05	.37	.62	.50	1.24	NS	.01
Non-IMPACT	340	18.58	6.17	.34					
6. Mathematics (40) IMPACT	266	11.74	4.04	.25	-.60	.32	-1.86	NS	.05
Non-IMPACT	340	12.34	3.80	.21					

\*Number of test items is in the parenthesis.

\*\*The significant differences are all in favor of IMPACT.

NS means not significant at the .05 level.

Table 1.1 (Cont'd.)

Subjects Tested* by Group	No. of Pupils Tested (n)	Mean ( $\bar{X}$ )	Standard Deviation (s)	Standard Error of the Mean ( $s_{\bar{x}}$ )	Differ- ence (D)	Standard Error of the Dif- ference ( $s_{\bar{x}-\bar{x}_1}$ )	t.	Level of Significance**	
								Feb.-March 1978	October 1977
7. Social Studies- English (30)									
IMPACT	266	10.62	3.88	.24					
Non-IMPACT	340	11.05	3.96	.21	-.43	.32	-1.35	NS	NS
8. Work Education (30)									
IMPACT	142	10.34	3.02	.25					
Non-IMPACT	162	10.63	3.16	.25	-.29	.36	-.81	NS	NS
9. Home Economics (30)									
IMPACT	146	11.16	3.66	.30					
Non-IMPACT	170	11.23	3.96	.30	-.07	.43	-.17	NS	.05

\*Number of test items is in the parenthesis.

\*\*The significant differences are all in favor of IMPACT.

NS means not significant at the .05 level.

Table 19

Significance of Differences Between Means of Level IV IMPACT and Non-IMPACT Pupils  
by Subject Area for Naga, Cebu in February-March 1978, Including  
Levels of Significance for the October 1977 Evaluation

Subjects Tested* by Group	No. of Pupils Tested (n)	Mean ( $\bar{X}$ )	Standard Deviation (s)	Standard Error of the Mean ( $s_{\bar{x}}$ )	Difference (D)	Standard Error of the Difference ( $s_{\bar{x}_2 - \bar{x}_1}$ )	t	Level of Significance**																																																																							
								Feb.-March 1978	October 1977																																																																						
1. Language (40) IMPACT	117	14.84	3.92	.36	.91	.69	1.32	NS	NS																																																																						
Non-IMPACT	69	13.93	5.47	.66						2. Reading (35) IMPACT	116	9.69	3.42	.32	-.31	.56	-.55	NS	NS	Non-IMPACT	63	10.00	3.86	.49	3. Wika (Language in Filipino) (50) IMPACT	118	15.86	3.92	.36	.12	.73	.17	NS	NS	Non-IMPACT	70	15.74	6.13	.73	4. Pagbasa (40) IMPACT	117	12.68	4.30	.40	1.61	.63	2.56	.05	NS	Non-IMPACT	67	11.08	3.74	.46	5. Science (40) IMPACT	116	14.87	4.70	.44	1.43	.72	1.99	.05	.01	Non-IMPACT	72	13.44	4.87	.57	6. Mathematics (30) IMPACT	118	8.80	2.98	.27	.03	.51	.06	NS	NS
2. Reading (35) IMPACT	116	9.69	3.42	.32	-.31	.56	-.55	NS	NS																																																																						
Non-IMPACT	63	10.00	3.86	.49						3. Wika (Language in Filipino) (50) IMPACT	118	15.86	3.92	.36	.12	.73	.17	NS	NS	Non-IMPACT	70	15.74	6.13	.73	4. Pagbasa (40) IMPACT	117	12.68	4.30	.40	1.61	.63	2.56	.05	NS	Non-IMPACT	67	11.08	3.74	.46	5. Science (40) IMPACT	116	14.87	4.70	.44	1.43	.72	1.99	.05	.01	Non-IMPACT	72	13.44	4.87	.57	6. Mathematics (30) IMPACT	118	8.80	2.98	.27	.03	.51	.06	NS	NS	Non-IMPACT	69	8.77	3.96	.48										
3. Wika (Language in Filipino) (50) IMPACT	118	15.86	3.92	.36	.12	.73	.17	NS	NS																																																																						
Non-IMPACT	70	15.74	6.13	.73						4. Pagbasa (40) IMPACT	117	12.68	4.30	.40	1.61	.63	2.56	.05	NS	Non-IMPACT	67	11.08	3.74	.46	5. Science (40) IMPACT	116	14.87	4.70	.44	1.43	.72	1.99	.05	.01	Non-IMPACT	72	13.44	4.87	.57	6. Mathematics (30) IMPACT	118	8.80	2.98	.27	.03	.51	.06	NS	NS	Non-IMPACT	69	8.77	3.96	.48																									
4. Pagbasa (40) IMPACT	117	12.68	4.30	.40	1.61	.63	2.56	.05	NS																																																																						
Non-IMPACT	67	11.08	3.74	.46						5. Science (40) IMPACT	116	14.87	4.70	.44	1.43	.72	1.99	.05	.01	Non-IMPACT	72	13.44	4.87	.57	6. Mathematics (30) IMPACT	118	8.80	2.98	.27	.03	.51	.06	NS	NS	Non-IMPACT	69	8.77	3.96	.48																																								
5. Science (40) IMPACT	116	14.87	4.70	.44	1.43	.72	1.99	.05	.01																																																																						
Non-IMPACT	72	13.44	4.87	.57						6. Mathematics (30) IMPACT	118	8.80	2.98	.27	.03	.51	.06	NS	NS	Non-IMPACT	69	8.77	3.96	.48																																																							
6. Mathematics (30) IMPACT	118	8.80	2.98	.27	.03	.51	.06	NS	NS																																																																						
Non-IMPACT	69	8.77	3.96	.48																																																																											

\*Number of test items is in the parenthesis.

\*\*The significant differences are all in favor of IMPACT.

NS means not significant at the .05 level.

Table 19 (Cont'd.)

Subjects Tested* by Group	No. of Pupils Tested (n)	Mean ( $\bar{X}$ )	Standard Deviation (s)	Standard Error of the Mean ( $s_{\bar{X}}$ )	Differ- ence (D)	Standard Error of the Dif- ference ( $s_{\bar{X}_2 - \bar{X}_1}$ )	t	Level of Significance**	
								Feb.-March 1978	October 1977
7. Social Studies -									
English (35)									
IMPACT	116	9.31	3.13	.29					
NON-IMPACT	76	9.71	2.81	.32	-.40	.44	-.90	NS	NS
8. Work Education (35)									
IMPACT	116	10.99	3.01	.28					
NON-IMPACT	76	9.21	2.71	.31	1.78	.43	4.17	.01	.05

\*Number of test items is in the parentheses.

\*\*The significant differences are all in favor of IMPACT.

NS means not significant, at the .05 level.

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Table 20

Significance of Differences Between Means of Level V IMPACT and Non-IMPACT Pupils  
by Subject Area for Naga, Cebu in February-March 1978, Including  
Levels of Significance for the October 1977 Evaluation

Subjects Tested* by Group	No. of Pupils Tested  (n)	Mean  ( $\bar{X}$ )	Standard Deviation  (s)	Standard Error of the Mean  ( $s_{\bar{X}}$ )	Difference  (D)	Standard Error of the Dif- ference  ( $s_{\frac{\bar{X}_2 - \bar{X}_1}{2}}$ )	t	Level of Significance**																																																																							
								Feb.-March 1978	October 1977																																																																						
1. Language (70) IMPACT	48	19.12	3.69	.53	.06	.78	.07	NS	NS																																																																						
Non-IMPACT	43	19.07	3.69	.56						2. Reading (40) IMPACT	48	11.06	3.28	.47	1.06	.63	1.69	NS	NS	Non-IMPACT	42	10.00	2.64	.40	3. Wika (Language in Pilipino) (60) IMPACT	49	18.61	4.58	.66	.09	.99	.09	NS	NS	Non-IMPACT	48	18.52	5.17	.75	4. Pagbasang (30) IMPACT	48	14.04	3.41	.49	.26	.84	.31	NS	NS	Non-IMPACT	46	13.78	4.67	.69	5. Science (50) IMPACT	51	17.49	5.22	.73	2.82	.93	3.04	.01	.01	Non-IMPACT	54	14.67	4.26	.58	6. Mathematics (40) IMPACT	50	10.98	3.70	.52	.18	.69	.27	NS	.05
2. Reading (40) IMPACT	48	11.06	3.28	.47	1.06	.63	1.69	NS	NS																																																																						
Non-IMPACT	42	10.00	2.64	.40						3. Wika (Language in Pilipino) (60) IMPACT	49	18.61	4.58	.66	.09	.99	.09	NS	NS	Non-IMPACT	48	18.52	5.17	.75	4. Pagbasang (30) IMPACT	48	14.04	3.41	.49	.26	.84	.31	NS	NS	Non-IMPACT	46	13.78	4.67	.69	5. Science (50) IMPACT	51	17.49	5.22	.73	2.82	.93	3.04	.01	.01	Non-IMPACT	54	14.67	4.26	.58	6. Mathematics (40) IMPACT	50	10.98	3.70	.52	.18	.69	.27	NS	.05	Non-IMPACT	54	10.80	3.32	.45										
3. Wika (Language in Pilipino) (60) IMPACT	49	18.61	4.58	.66	.09	.99	.09	NS	NS																																																																						
Non-IMPACT	48	18.52	5.17	.75						4. Pagbasang (30) IMPACT	48	14.04	3.41	.49	.26	.84	.31	NS	NS	Non-IMPACT	46	13.78	4.67	.69	5. Science (50) IMPACT	51	17.49	5.22	.73	2.82	.93	3.04	.01	.01	Non-IMPACT	54	14.67	4.26	.58	6. Mathematics (40) IMPACT	50	10.98	3.70	.52	.18	.69	.27	NS	.05	Non-IMPACT	54	10.80	3.32	.45																									
4. Pagbasang (30) IMPACT	48	14.04	3.41	.49	.26	.84	.31	NS	NS																																																																						
Non-IMPACT	46	13.78	4.67	.69						5. Science (50) IMPACT	51	17.49	5.22	.73	2.82	.93	3.04	.01	.01	Non-IMPACT	54	14.67	4.26	.58	6. Mathematics (40) IMPACT	50	10.98	3.70	.52	.18	.69	.27	NS	.05	Non-IMPACT	54	10.80	3.32	.45																																								
5. Science (50) IMPACT	51	17.49	5.22	.73	2.82	.93	3.04	.01	.01																																																																						
Non-IMPACT	54	14.67	4.26	.58						6. Mathematics (40) IMPACT	50	10.98	3.70	.52	.18	.69	.27	NS	.05	Non-IMPACT	54	10.80	3.32	.45																																																							
6. Mathematics (40) IMPACT	50	10.98	3.70	.52	.18	.69	.27	NS	.05																																																																						
Non-IMPACT	54	10.80	3.32	.45																																																																											

\*Number of test items is in the parenthesis.

\*\*The significant differences are all in favor of IMPACT.

NS means not significant at the .05 level.

Table 20 (Cont'd.)

Subjects tested* by Group	No. of Pupils Tested (n)	Mean ( $\bar{X}$ )	Standard Deviation (s)	Standard Error of the Mean ( $s_{\bar{X}}$ )	Differ- ence (D)	Standard Error of the Dif- ference ( $s_{\bar{X}_2 - \bar{X}_1}$ )	t	Level of Significance**	
								Feb.-March 1978	October 1977
7. Social Studies- English (30)									
IMPACT	51	8.82	2.84	.40	.36	.57	.64	NS	NS
Non-IMPACT	54	8.46	2.96	.40					
8. Work Education- English (30)									
IMPACT	24	8.88	3.34	.68	.14	.92	.15	NS	NS
Non-IMPACT	19	8.74	2.45	.56					
9. Home Economics (30)									
IMPACT	25	10.08	2.47	.49	2.01	.71	2.81	.01	.05
Non-IMPACT	28	8.07	2.71	.51					

\*Number of test items is in the parenthesis.

\*\*The significant differences are all in favor of IMPACT.  
NS means not significant at the .05 level.

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Table 2

Significance of Differences Between Means of Level VI IMPACT and Non-IMPACT Pupils  
by Subject Area for Naga, Cebu in February-March 1978, Including  
Levels of Significance for the October 1977 Evaluation

Subjects Tested* by Group	No. of Pupils Tested (n)	Mean ( $\bar{X}$ )	Standard Deviation (s)	Standard Error of the Mean ( $s_{\bar{X}}$ )	Differ- ence (D)	Standard Error of the Dif- ference ( $s_{\bar{X}_2 - \bar{X}_1}$ )	t	Level of Significance**	
								Feb.-March 1978	October 1977
1. Language (70) IMPACT	31	22.26	4.40	.79	2.38	.92	2.58	.01	NS
Non-IMPACT	57	19.88	3.98	.53					
2. Reading (40) IMPACT	31	11.16	2.93	.53	.51	.76	.68	NS	.05
Non-IMPACT	57	10.65	3.60	.48					
3. Wika (Language in Filipino) (60) IMPACT	31	19.36	5.26	.94	.27	1.22	.22	NS	.05
Non-IMPACT	59	19.09	5.57	.73					
4. Pagbasa (50) IMPACT	31	15.64	3.70	.66	1.77	.75	2.35	.05	.05
Non-IMPACT	58	13.88	3.18	.42					
5. Science (50) IMPACT	31	19.61	6.22	1.12	3.02	1.10	2.75	.01	.01
Non-IMPACT	59	16.59	4.14	.54					
6. Mathematics (40) IMPACT	31	12.16	4.19	.75	.13	.79	.16	NS	.05
Non-IMPACT	59	12.03	3.22	.42					

\*Number of test items is in the parenthesis.

\*\*The significant differences are all in favor of IMPACT.

NS means not significant at the .05 level.

Table 2. (Cont'd.)

Subjects Tested* by Group*	No. of Pupils Tested (n)	Mean ( $\bar{X}$ )	Standard Deviation (s)	Standard Error of the Mean ( $s_{\bar{X}}$ )	Difference (D)	Standard Error of the Difference ( $s_{\bar{X}_2 - \bar{X}_1}$ )	t	Level of Significance**	
								Feb.-March 1978	October 1977
7. Social Studies-English (30)									
IMPACT	31	10.45	3.50	.63					
Non-IMPACT	59	10.34	3.43	.45	.11	.77	.15	NS	NS
8. Work Education (30)									
IMPACT	14	9.71	2.02	.54					
Non-IMPACT	25	9.08	1.85	.37	.63	.64	1.00	NS	NS
9. Home Economics (30)									
IMPACT	17	12.12	4.58	1.11					
Non-IMPACT	32	10.34	3.37	.60	1.77	1.15	1.55	NS	NS

\*Number of test items is in the parenthesis.

\*\*The significant differences are all in favor of IMPACT.

NS means not significant at the .05 level.

Differences in mean scores were significant at the .01 level, in favor of IMPACT, in Wika (Language in Pilipino), Pagbasa (Reading in Pilipino), Science, Mathematics and Social Studies-Pilipino. This indicates that there is only one chance in 100 of being wrong when we reject the hypothesis that there is no significant difference in the achievement of the two groups in these subjects. The alternative hypothesis which we accept is that there are true differences in the achievement of IMPACT and of Non-IMPACT in the aforementioned subjects with IMPACT having higher achievement.

Results of the comparisons of mean scores of Level IV IMPACT and Non-IMPACT pupils in Reading, Social Studies-English and Work Education-English were not significant. This implies that the difference in the mean scores of IMPACT and of Non-IMPACT in each of these subjects may be due to sampling errors and, hence, the difference is only a chance difference. The results may be reversed in favor of the other group should the study be repeated.

Similar interpretations of levels of significance may be made for results of significance tests reported in subsequent sections of this report.

An analysis of the test results in Level IV shows that Level IV IMPACT obtained significantly higher mean scores than Level IV Non-IMPACT in seven of ten tests administered. When grouped by levels of mental ability, the Level IV pupils of high mental ability in the Non-IMPACT group scored significantly higher than their counterparts in the IMPACT group in five of ten subjects tested - Language, Reading, Wika (Language in Pilipino), Pagbasa (Reading in Pilipino) and Work Education-English. In the five other

subjects, the differences in the mean scores of IMPACT and Non-IMPACT pupils of high mental ability were not significant. On the other hand, significant differences in the mean scores of Level IV IMPACT and Non-IMPACT pupils in the average and in the low ability groups were all in favor of IMPACT; four in the average group (Pagbasa, Science, Mathematics and Social Studies-Pilipino); and three in the low ability group (Wika, Pagbasa, and Science). Six differences in the average group and seven differences in the low ability group were non-significant. (Table 16, Appendix E).

#### For Naga, Cebu

There were significant differences in the mean scores of Level IV IMPACT and Non-IMPACT pupils, in favor of IMPACT, in two subjects; very significant for Science and significant for Work Education-English. The six other differences were non-significant.

### Findings in the Final Evaluation in February-March 1978

#### For the Three Sites Combined

Results in Level IV for the three sites combined indicate that in two of ten subjects tested, the differences in mean scores were statistically significant, in favor of IMPACT; very significant for Pagbasa and significant for Work Education-English. The eight other differences were non-significant.

#### For Naga, Cebu

In Naga, Cebu, only eight tests were administered in Level IV for the pupils opted to take only the English version of the tests in Social Studies and Work Education, as was the case in the initial evaluation.

Differences in mean scores in three of eight subjects tested were statistically significant, in favor of IMPACT; very significant for Work Education-English and significant for Pagbasa and Science. The five other differences were non-significant.

The analysis by levels (IV, V or VI) will be on the basis of the type of results, whether consistent or inconsistent, in the initial evaluation in October 1977 and in the final evaluation in February-March 1978.

A breakdown of the categories used based on the results obtained follows\*:

1. Consistent results
  - a. Means of IMPACT and of Non-IMPACT are not significantly different in the initial and final evaluations, or
  - b. Means of IMPACT and of Non-IMPACT are significantly different, in favor of IMPACT, in the initial and final evaluations.
2. Inconsistent results
  - a. Means are significantly different, in favor of IMPACT, in the initial evaluation but are not significantly different in the final evaluation, or
  - b. Means are not significantly different in the initial evaluation but are significantly different, in favor of IMPACT, in the final evaluation.

An analysis of the results of the comparisons of the means of IMPACT and of Non-IMPACT in Level IV in the October 1977 and in the February-March 1978 evaluations was made following the above-mentioned classification scheme. This was done by level for the three sites combined and for Naga, Cebu.

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\* This does not include all possible categories because no other categories besides those indicated were observed or obtained. There was not a single instance in which a mean of Non-IMPACT was significantly higher than the mean of IMPACT.

Level IV

## 1. Consistent Results

a. Means of IMPACT and of Non-IMPACT not significantly different both in initial and final evaluations	b. Means of IMPACT and of Non-IMPACT significantly different, in favor of IMPACT, in both initial and final evaluations
--	---

For the Three Sites Combined

- (1) Reading
- (2) Social Studies-English

For the Three Sites Combined

- (1) Pagbasa

For Naga, Cebu

- (1) Language
- (2) Reading
- (3) Wika
- (4) Mathematics
- (5) Social Studies-English

For Naga, Cebu

- (1) Science
- (2) Work Education-English

The above table shows that differences between means of Level IV IMPACT and Non-IMPACT pupils in the three sites combined are non-significant in both the initial and final evaluations in two subjects, Reading and Social Studies-English. This shows that the findings are consistent that there is no significant difference in pupil achievement under IMPACT and Non-IMPACT in the two aforementioned subjects in Level IV.

Another consistent finding is that in Pagbasa there is a significant difference in the achievement of Level IV IMPACT and Non-IMPACT pupils, with IMPACT pupils having higher achievement in both the initial and final evaluations.

Relative to the findings in Naga, Cebu, the above table shows that results in both the initial and final evaluations are consistent that the Level IV IMPACT and Non-IMPACT pupils have comparable achievement in five subjects - Language, Reading, Wika, Mathematics and Social Studies. Another consistent finding in Naga, Cebu is that the IMPACT pupils did

significantly better than the Non-IMPACT pupils in both initial and final evaluations in two subjects, Science and Work Education-English.

Results in Level IV which are not consistent in the initial and final evaluations for the three sites combined and for Naga, Cebu are as follows:

## 2. Inconsistent Results

- |   |  |
|---|--|
| a. Means of IMPACT and of Non-IMPACT significantly different, in favor of IMPACT, in initial evaluation but not significantly different in final evaluation | b. Means of IMPACT and of Non-IMPACT not significantly different in initial evaluation but significantly different in final evaluation, in favor of IMPACT |
|---|--|

### For the Three Sites Combined

- (1) Language
- (2) Wika
- (3) Science
- (4) Mathematics
- (5) Araling Panlipunan  
(Social Studies in Pilipino)
- (6) Edukasyong Panggawain  
(Work Education in Pilipino)

### For the Three Sites Combined

- (1) Work Education-English

### For Naga, Cebu

N o n e

### For Naga, Cebu

- (1) Pagbasa  
(Reading in Pilipino)

Unlike the findings earlier presented, the results in the above table show lack of agreement between results of the initial evaluation and those of the final evaluation. Differences between the mean scores of Level IV IMPACT and

of Non-IMPACT in the three sites combined were statistically significant, in favor of IMPACT, during the initial evaluation but were non-significant during the final evaluation in six subjects: Language, Wika, Science, Mathematics, Araling Panlipunan (Social Studies in Pilipino) and Edukasyong Panggawain (Work Education in Pilipino). The reverse is true in one subject, Work Education-English, in which the difference between the means of IMPACT and of Non-IMPACT during the initial evaluation was non-significant but in the final evaluation, significant. With regard to a number of tests in which the means of IMPACT were significantly higher than those of Non-IMPACT in the initial evaluation but were not significantly different during the final evaluation, it is well to bring out at this point that the conventional system lends itself more easily to drilling for tests than the IMPACT system. Under IMPACT, instead of instructing or directly teaching the pupils as is done in the conventional system, the teacher called Instructional Supervisor (IS) manages children's experiences which include largely "non-teaching" types of instruction.

In one subject in Level IV in Naga, Cebu, the findings in the initial evaluation and in the final evaluation were inconsistent for the difference between the means of IMPACT and of Non-IMPACT in Pagbasa (Reading in Pilipino) was non-significant in the initial evaluation but was significant in the final evaluation, in favor of IMPACT.

#### Level V

##### Findings in the Initial Evaluation in October 1977

##### For the Three Sites Combined

In Level V, differences in mean scores in four of the nine tests administered were statistically significant, in favor of IMPACT: very significant for Science and Mathematics and significant for Wika and Pagbasa. Differences in mean scores

were non-significant for five subjects: Language, Reading, Social Studies-English, Work Education-English and Home Economics.

In Level V, analysis by levels of mental ability (High, Average, Low) shows that there was no significant difference in the achievement of IMPACT and of Non-IMPACT pupils of comparable mental ability except in one subject tested in each level of mental ability. In the high ability group, the difference in means in Mathematics was significant at the .05 level, in favor of IMPACT; in the average group, the difference in means in Pagbasa at the .05 level, also in favor of IMPACT; and in the low ability group, at the .01 level for Science, also in favor of IMPACT.

For Naga, Cebu

In Level V, differences in mean scores were significant, in favor of IMPACT, in three subjects: very significant for Science and significant for Mathematics and Home Economics. The six other differences were non-significant.

Findings in the Final Evaluation in February-March 1978

For the Three Sites Combined

Results for the three sites combined indicate that in three or one-third of the nine subjects tested in Level V, the differences in mean scores were statistically significant in favor of IMPACT: very significant for Reading and Wika and significant for Pagbasa. The six other differences were non-significant.

For Naga, Cebu

In Level V in Naga, Cebu, differences in mean scores were very significant, in favor of IMPACT, in two subjects - Science and Home Economics.

The seven other differences were non-significant.

An analysis based on the consistency of the results of the comparisons of means of Level V IMPACT and of Non-IMPACT in the initial and final evaluations follows:

Level V

## 1. Consistent Results

a. Means of IMPACT and of Non-IMPACT not significantly different both in initial and final evaluations	b. Means of IMPACT and of Non-IMPACT significantly different, in favor of IMPACT, in both initial and final evaluations
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For the Three Sites Combined

- (1) Language
- (2) Social Studies-English
- (3) Work Education-English
- (4) Home Economics

For the Three Sites Combined

- (1) Wika
- (2) Pagbasa

For Naga, Cebu

- (1) Language
- (2) Reading
- (3) Wika
- (4) Pagbasa
- (5) Social Studies-English
- (6) Work Education-English

For Naga, Cebu

- (1) Science
- (2) Home Economics

The above table for Level V shows some consistent findings in the initial and final evaluations for the

three sites combined and for Naga, Cebu. These findings show no significant difference in the achievement of IMPACT and of Non-IMPACT in four subjects: Language, Social Studies-English, Work Education-English and Home Economics.

The findings are also consistent in two subjects, Wika and Pagbasa. The findings indicate significant differences in the achievement of IMPACT and of Non-IMPACT, with IMPACT having higher achievement in both the initial evaluation and final evaluation.

Results for Level V in Naga, Cebu show consistent findings in the initial and final evaluations which indicate no significant difference in the achievement of IMPACT and of Non-IMPACT in six subjects: Language, Reading, Wika, Pagbasa, Social Studies-English and Work Education-English.

The findings in Naga, Cebu are also consistent that in two Level V subjects, Science and Home Economics, there are significant differences in the achievement of IMPACT and of Non-IMPACT, in favor of IMPACT, in the initial evaluation and in the final evaluation.

Some of the results of the comparisons of means of Level V IMPACT and of Non-IMPACT in the initial evaluation are not consistent with results in the final evaluation as indicated in the following table:

## 2. Inconsistent Results

a. Means of IMPACT and of Non-IMPACT significantly different, in favor of IMPACT, in initial evaluation, but not significantly different in final evaluation	b. Means of IMPACT and of Non-IMPACT not significantly different in initial evaluation but significantly different in final evaluation, in favor of IMPACT
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For the Three Sites Combined

- (1) Science
- (2) Mathematics

For Naga, Cebu  
(1) Mathematics

For the Three Sites Combined

- (1) Reading

For Naga, Cebu  
N o n e

Data in Level V for the three sites combined indicate inconsistent findings in three subjects (Science, Mathematics and Reading). The means of IMPACT were significantly higher than the means of Non-IMPACT for Science and Mathematics in the initial evaluation but were comparable in the final evaluation. In Reading, the difference in means was not significant in the initial evaluation but was significant in the final evaluation, in favor of IMPACT.

In one subject, Mathematics, in Level V in Naga, Cebu, there was a significant difference in the mean scores of IMPACT and of Non-IMPACT in the initial evaluation, in favor of IMPACT, but the difference in mean scores in this subject was non-significant in the final evaluation.

#### Level VI

##### Findings in the Initial Evaluation in October 1977

##### For the Three Sites Combined

In Level VI, differences in mean scores in seven of the nine subjects tested were statistically significant, all in favor of IMPACT: very significant for Language, Reading, Wika, Pagbasa and Science; and significant for Mathematics and Home Economics. Differences in mean scores were non-significant for two subjects, Social Studies-English and Work Education-English.

The analysis by levels of mental ability in Level VI shows that there was no significant difference in the achievement of IMPACT and Non-IMPACT pupils of high mental ability in all the

subjects tested. Among Level VI pupils of average mental ability, differences in mean scores were statistically significant, in favor of IMPACT, in three subjects: very significant for Wika and Pagbasa, and significant for Social Studies-English. The findings in the low ability group were similar to those in the average group, i.e., significant differences were also found in three subjects, in favor of IMPACT: very significant for Wika and Pagbasa and significant for Social Studies-English.

For Naga, Cebu

In five of the nine subjects tested in Level VI, difference in mean scores were statistically significant in favor of IMPACT; very significant for Science, and significant for Reading, Wika, Pagbasa and Mathematics. Differences in mean scores in four subjects were non-significant.

Findings in the Final Evaluation in February-March 1978

For the Three Sites Combined

In Level VI, there were two significant differences in mean scores, both in favor of IMPACT: very significant for Wika and significant for Pagbasa. The seven other differences were non-significant.

For Naga, Cebu

In Level VI in Naga, three or one-third of the nine obtained differences in mean scores in the subjects tested were significant: very significant in two subjects - Language and Science, and significant in Pagbasa. The six other differences were non-significant.

An analysis of the results of comparisons of means of IMPACT and of Non-IMPACT in the initial evaluation in October 1977 and in the final evaluation in February-March 1978 for the three sites combined and for Naga, Cebu follows:

Level VI

1. Consistent Results -

a. Means of IMPACT and of Non-IMPACT not significantly different both in initial and final evaluations	b. Means of IMPACT and of Non-IMPACT significantly different, in favor of IMPACT, in both initial and final evaluations
<u>For the Three Sites Combined</u>	<u>For the Three Sites Combined</u>
(1) Social Studies-English	(1) <u>Wika</u>
(2) Work Education-English	(2) <u>Pagbasa</u>
<u>For Naga, Cebu</u>	<u>For Naga, Cebu</u>
(1) Social Studies-English	(1) <u>Pagbasa</u>
(2) Work Education-English	(2) Science
(3) Home Economics	

The findings in both the initial and final evaluations indicate that there is no significant difference in the achievement of Level VI IMPACT and Non-IMPACT in two subjects, Social Studies-English and Work Education-English, but that there are significant differences in the achievement of IMPACT and of Non-IMPACT in two subjects, Wika and Pagbasa, with IMPACT having higher achievement.

Results for Level VI in Naga, Cebu show means which are not significantly different indicating comparable achievement of IMPACT and of Non-IMPACT in three subjects, Social Studies-English, Work Education-English

and Home Economics, during both the initial and final evaluations. There were significantly different means, indicating unequal achievement in two subjects, Pagbasa and Science, with IMPACT having higher achievement.

Inconsistency of findings in the initial and final evaluations relative to the comparisons of means of Level VI IMPACT and Non-IMPACT may be noted in the following table:

2. Inconsistent Results -

a. Means of IMPACT and of Non-IMPACT significantly different, in favor of IMPACT, in initial evaluation but not significantly different in final evaluation	b. Means of IMPACT and of Non-IMPACT not significantly different in initial evaluation but significantly different in final evaluation, in favor of IMPACT
<u>For the Three Sites Combined</u>	<u>For the Three Sites Combined</u>
(1) Language (2) Reading (3) Science (4) Mathematics (5) Home Economics	None
<u>For Naga, Cebu</u>	<u>For Naga, Cebu</u>
(1) Reading (2) <u>Wika</u> (3) Mathematics	(1) Language

As indicated in the above table for Level VI, in the initial evaluation, the means of IMPACT were significantly higher than those of Non-IMPACT in five subjects; Language, Reading, Science, Mathematics, and Home Economics. In the final evaluation, however, the means of IMPACT and of Non-IMPACT in these subjects were no longer significantly different but were comparable.

Likewise, in Level VI in Naga, Cebu, IMPACT scored significantly higher than Non-IMPACT in three subjects /Reading, Wika (Language in Pilipino), and Mathematics/ in the initial evaluation but there was no significant difference in the achievement of the two groups in these subjects during the final evaluation. The reverse was true in Language in which the difference between means was non-significant in the initial evaluation but was significant in the final evaluation, in favor of IMPACT.

## 2. Comparison of Growth/Gains in Achievement

The analysis of growth/gains in achievement is based on data for Naga, Cebu, the original IMPACT site.

### Relationship Between Growth/Gains in Achievement and Initial Achievement Test Scores

This was determined with the use of the product moment coefficient of correlation ( $r$ ). Computations were made using the Hewlett-Packard 25 program on covariance and correlation coefficient<sup>1</sup>.

The following correlation coefficients were obtained:

<u>Language</u>	<u>IMPACT</u>	<u>NON-IMPACT</u>
Level IV	-0.58	-0.30
Level V	-0.10	-0.67
Level VI	-0.14	-0.45
<u>Reading</u>	<u>IMPACT</u>	<u>NON-IMPACT</u>
Level IV	-0.58	-0.52
Level V	-0.46	-0.58
Level VI	-0.69	-0.46

<sup>1</sup>Hewlett-Packard Company, Ibid.

<u>Wika (Language in Filipino)</u>	<u>IMPACT</u>	<u>NON-IMPACT</u>
Level IV	-0.59	-0.14
Level V	-0.57	-0.42
Level VI	-0.28	-0.41
<u>Pagbasa (Reading in Filipino)</u>	<u>IMPACT</u>	<u>NON-IMPACT</u>
Level IV	-0.47	-0.52
Level V	-0.68	-0.30
Level VI	-0.49	-0.62
<u>Science</u>	<u>IMPACT</u>	<u>NON-IMPACT</u>
Level IV	-0.45	-0.35
Level V	-0.40	-0.49
Level VI	-0.26	-0.30
<u>Mathematics</u>	<u>IMPACT</u>	<u>NON-IMPACT</u>
Level IV	-0.56	-0.26
Level V	-0.55	-0.66
Level VI	-0.48	-0.57
<u>Social Studies</u>	<u>IMPACT</u>	<u>NON-IMPACT</u>
Level IV	-0.61	-0.63
Level V	-0.66	-0.56
Level VI	-0.28	-0.46
<u>Work Education</u>	<u>IMPACT</u>	<u>NON-IMPACT</u>
Level IV	-0.63	-0.64
Level V	-0.39	-0.20
Level VI	-0.81	-0.89
<u>Home Economics</u>	<u>IMPACT</u>	<u>NON-IMPACT</u>
Level V	-0.57	-0.52
Level VI	-0.10	-0.56

All the obtained correlation coefficients are negative, a finding consistent with available research evidence that there is a negative correlation between pretest or initial

test scores and growth/gains in achievement.<sup>1</sup> Research has shown that pupils whose scores are lowest at the beginning make considerably larger gains than the pupils whose scores are initially high; that the initially high scoring pupils gain little or nothing and some even appear to have lost ground. Despite the larger gains that they make, however, initially low scoring pupils do not score as high as, or higher than, initially high scoring pupils in the posttests.

The correlation coefficients ranged from -0.10 to -0.89.

The following distribution of the correlation values gives indications of the strength of the relationship between initial scores and growth/gains in achievement:

<u>r</u>	<u>Interpretation of r*</u>	<u>IMPACT</u>	<u>NON-IMPACT</u>
0.00 to $\pm 0.20$	Indifferent or negligible relationship	3	2
$\pm 0.20$ to $\pm 0.40$	Low correlation, present but slight	4	5
$\pm 0.40$ to $\pm 0.70$	Substantial or marked relationship	18	18
$\pm 0.70$ to $\pm 1.00$	High to very high relationship	1	1

As shown in the foregoing table, in 19 or 73 per cent of the 26 subjects tested in Naga, Cebu, there was from marked to very high negative relationship between initial or pretest scores and growth/gains in achievement.

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<sup>1</sup>Paul B. Diederich, "Pitfalls in the Measurement of Gains in Achievement", Curriculum Evaluation, ed. by David A. Payne (Canada: D.C. Heath and Company, 1974), pp. 241-245.

\*Henry E. Garrett, Statistics in Psychology and Education (Bombay: Vakils, Feffer and Simons Private Ltd., 1966), p. 176.

Results of Tests of Homogeneity and Concurrence of  
Regressions

To compare the extent of growth/gains in the achievement of IMPACT and Non-IMPACT pupils, tests of homogeneity and concurrence of regressions of growth/gains in achievement on initial scores were made using the analysis of variance. These statistical tests were, however, made only for subjects for which the coefficients of determination ( $r^2$ ) were 0.10 and above; i.e., if in a subject either or both IMPACT and Non-IMPACT has an  $r^2$  of 0.09 or below, the statistical tests were no longer made for then the regression of gains on initial scores would not be linear and, therefore, the assumption of linearity of regressions underlying the use of the aforementioned statistical tests is not met. Consequently, statistical tests were made in only fourteen of twenty-six subjects tested.

Even with the elimination of some subjects with  $r^2$  values of 0.09 or below, there still remained a number of subjects for which the  $r^2$  values were quite low but for which the tests of homogeneity and concurrence of regressions were made. As previously mentioned, this was done just to get general trends in growth/gains in pupil achievement.

The results of tests of homogeneity and concurrence of regressions, using the analysis of variance, are presented in Table 22. The estimated regression equations and more detailed data on the analysis of variance for each subject by level are presented in Appendix F.

Table 22

Summary of Results of Analysis of Variance to Test  
Homogeneity and Concurrence of Regressions

Subjects by Level	Computed F's	
	Test of Parallelism of Regressions	Test of Concurrence of Positions
Language		
Level IV ***		
Level V ***		
Level VI ***		
Reading		
Level IV	0.3159 NS	0.2745 NS
Level V	0.0739 NS	3.0560 NS
Level VI	0.0085 NS	0.1650 NS
Wika (Language in Pilipino)		
Level IV ***		
Level V	0.4020 NS	18.1725** In favor of IMPACT
Level VI ***		
Pagbasa (Reading in Pilipino)		
Level IV	0.0892 NS	30.3140** In favor of IMPACT
Level V ***		
Level VI	1.5045 NS	0.5729 NS
Science		
Level IV ***		
Level V	0.0788 NS	3.1334 NS
Level VI ***		
Mathematics		
Level IV ***		
Level V	0.0829 NS	0.2045 NS
Level VI	0.0501 NS	0.0149 NS

NS - not significant at the .05 level

\*\* - significant at .01 level

\*\*\* - Estimates of regressions were not made  
because of low  $r^2$  values.

Table 22 (continued)

Subjects by Level	Computed F's	
	Test of Parallelism of Regressions	Test of Concurrence of Positions
Social Studies		
Level IV	0.4676 NS	1.1387 NS
Level V	1.2226 NS	1.2646 NS
Level VI***		
Work Education		
Level IV	0.0165 NS	15.5107** In favor of IMPACT
Level V***		
Level VI	3.2524 NS	0.2472 NS
Home Economics		
Level V	0.0978 NS	1.8514 NS
Level VI***		

NS - not significant at the .05 level

\*\* - significant at .01 level

\*\*\* - Estimates of regressions were not made  
because of low  $r^2$  values.

To facilitate interpretation of the data, graphical representations of the regressions of IMPACT and Non-IMPACT were made for each subject by level. (Figures 13-20, Appendix H).

As shown in Table 22, in 11 of 14 tests for which comparisons in growth/gains in the achievement of IMPACT and Non-IMPACT pupils were made, the obtained F-ratios for the tests of both regressions and positions were non-significant. This implies that in each of these 11 tests, there is insufficient evidence to show that there is a difference in the extent of growth/gains in the achievement of IMPACT and Non-IMPACT pupils.

Since the differences of regressions and positions for IMPACT and Non-IMPACT in the 11 tests were non-significant, an estimated combined or common regression equation was

computed for each of these subjects. (Appendix F) These are reflected in common regression lines for subjects concerned as shown in Figures 13 and 15-20, Appendix H. Each of the common regression equations may be used to estimate or predict the growth/gains in achievement that a pupil whether in IMPACT or Non-IMPACT schools will make, given his initial score in an achievement test in a subject. Estimates of growth/gains in the achievement of IMPACT and Non-IMPACT pupils may also be made with the use of graphs of the common regression lines.

One should, however, be cautious in the use of the regression equations or the graphs to estimate or predict growth/gains in achievement based on initial scores especially in subjects with low and moderate  $r^2$  values.

In each of three subjects Wika (Language in Pilipino) in Level V, Pagbasa (Reading in Pilipino) in Level IV, and Work Education also in Level IV<sup>7</sup>, while the test of parallelism of regressions was non-significant, the test of difference of positions was significant. The significant F-ratios for the test of concurrence of positions, all in favor of IMPACT, indicate that in each of these three subjects, the IMPACT pupils made significantly bigger gains in achievement than the Non-IMPACT pupils. For each subject concerned, this is graphically represented by two parallel regression lines, with the regression line for IMPACT higher or above the regression line for Non-IMPACT. (Figures 14, 15 and 19, Appendix H)

At this point, it is well to bear in mind that the tests of homogeneity and concurrence of regressions using the analysis of variance take into account the whole range of initial scores in making the comparisons. The three significant F-ratios for the test of concurrence of positions, all in favor of IMPACT, are therefore very meaningful.

Since in each of the three aforementioned subjects, the regressions for IMPACT and Non-IMPACT have the same slope but different intercepts, the combined or common slope ( $b_c$ ) for each subject was used while the intercepts of the individual regressions were retained. (Appendix F)

The aforementioned findings indicate that insofar as relative extent of growth/gains in achievement is concerned, the IMPACT pupils did as well as or better than the Non-IMPACT pupils. It may be recalled that a similar trend was indicated in the comparison of means for IMPACT and Non-IMPACT in the different subject areas tested.

#### Relationship Between Mental Ability and Growth/Gains in Achievement

The measure of this relationship is the product moment coefficient of correlation between scores in a non-verbal mental ability test and growth/gains in achievement. Computations were performed also with the use of the Hewlett-Packard program on covariance and correlation coefficient<sup>1</sup>.

The following correlation coefficients and the corresponding coefficients of determination were obtained:

	<u>IMPACT</u>		<u>NON-IMPACT</u>	
	r	r <sup>2</sup>	r	r <sup>2</sup>
<u>Language</u>				
Level IV	-0.04	0.0016	0.28	0.0784
Level V	0.28	0.0784	0.22	0.0484
Level VI	0.01	0.0001	0.05	0.0025

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<sup>1</sup>Hewlett-Packard Company, Ibid.

	<u>IMPACT</u>		<u>NON-IMPACT</u>	
	r	r <sup>2</sup>	r	r <sup>2</sup>
<u>Reading</u>				
Level IV	0.03	0.0009	0.03	0.0009
Level V	0.09	-0.0081	-0.09	0.0081
Level VI	-0.26	0.0675	-0.07	0.0049
<u>Wika (Language in Pilipino)</u>				
Level IV	0.15	0.0225	-0.03	0.0009
Level V	0.10	0.0100	0.11	0.0121
Level VI	0.03	0.0009	0.12	0.0144
<u>Pagbasa (Reading in Pilipino)</u>				
Level IV	0.07	0.0049	0.01	0.0001
Level V	0.26	0.0675	0.12	0.0144
Level VI	0.03	0.0009	0.0002	0.00000004
<u>Science</u>				
Level IV	0.19	0.0361	-0.16	0.0256
Level V	0.0074	0.000005	-0.06	0.0036
Level VI	0.09	0.0081	-0.03	0.0009
<u>Mathematics</u>				
Level IV	0.21	0.0441	0.01	0.0001
Level V	-0.06	0.0036	-0.08	0.0064
Level VI	0.27	0.0729	0.14	0.0196
<u>Social Studies</u>				
Level IV	0.13	0.0169	0.06	0.0036
Level V	0.06	0.0036	0.17	0.0289
Level VI	0.11	0.0121	0.13	0.0169
<u>Work Education</u>				
Level IV	-0.03	0.0009	0.08	0.0064
Level V	0.18	0.0324	-0.25	0.0625
Level VI	-0.15	0.0225	-0.10	0.0100

	<u>IMPACT</u>		<u>NON-IMPACT</u>	
	r	r <sup>2</sup>	r	r <sup>2</sup>
<u>Home Economics*</u>				
Level V	-0.08	0.0064	0.32	0.1024
Level VI	0.26	0.0676	-0.11	0.0121

\*Administered only in Levels V and VI

The coefficients of correlation between scores in a non-verbal mental ability test and growth/gains in achievement range from -0.25 to 0.32.

The following distribution of the correlation values gives indications of the strength of the relationship:

<u>r</u>	<u>Interpretation of r<sup>1</sup></u>	<u>IMPACT</u>	<u>NON-IMPACT</u>
0.00 to <u>+0.20</u>	Indifferent or negligible relationship	20	22
<u>+0.20</u> to <u>+0.40</u>	Low correlation present but slight	6	4

As shown in the foregoing tabulation, 20 or 77 per cent of the correlation values for IMPACT and 22 or 85 per cent of these values for Non-IMPACT indicate indifferent or negligible linear relationship.

The corresponding coefficients of determination (r<sup>2</sup>) range from 0.0000 to 0.0784. This means that at best or even in the two subjects with the highest r<sup>2</sup> values, only 8 per cent of the variation in growth/gains in achievement is accounted for or explained by the mental ability test scores.

Consequently, comparisons of growth/gains in achievement of IMPACT and Non-IMPACT pupils with the same mental ability scores were no longer made.

<sup>1</sup>Henry E. Garrett, Ibid.

#### IV. SUMMARY AND CONCLUSIONS

##### Summary

The main concern of this study was to evaluate the learning effectiveness of the IMPACT system by comparing the achievement of pupils in IMPACT schools with the achievement of pupils in comparable Non-IMPACT schools. The evaluation of achievement involved: (1) a comparison of mean scores in achievement tests of IMPACT and of Non-IMPACT pupils by subject area and level; and (2) a comparison of the growth/gains in the achievement of IMPACT and of Non-IMPACT pupils also by subject area and level. Comparisons were also made with respect to certain school, teacher and pupil characteristics which may have some bearing on academic achievement.

Since comparisons had to be made in the pupils' achievement status as well as in the extent of growth/gains in their achievement, evaluation was undertaken twice - the initial evaluation in October 1977 and the final evaluation in February-March 1978, for which Part I and Part II, respectively, of the IMPACT evaluation report were prepared. This report integrates Part I and Part II. For more detailed data on the initial evaluation and final evaluation, reference may be made to Part I and Part II, respectively, of the IMPACT evaluation report.

The subjects for the initial evaluation in October 1977 consisted of 2169 pupils (1049 IMPACT and 1120 Non-IMPACT), 68 teachers of

these pupils (33 IMPACT and 35 Non-IMPACT), and 16 school heads (9 IMPACT, 7 Non-IMPACT); for the final evaluation in February-March 1978 2096 pupils (1004 IMPACT and 1092 Non-IMPACT), 71 teachers of these pupils (31 IMPACT and 40 Non-IMPACT) and 15 school heads (9 IMPACT and 6 Non-IMPACT).

There were differences in the number of pupils included in the study in the initial evaluation and final evaluation because some pupils who took the tests in October 1977 were unable to take the tests in February-March 1978 and some pupils who took the tests in February-March 1978 had failed to take the same tests in October 1977.

The SOUTELE (Survey of Outcomes of Elementary Education) instruments developed for Grades IV and VI pupils in Philippine government and private schools were used to gather data for this study. The research instruments used included a non-verbal mental ability test; achievement tests in the Language Arts in Pilipino and in English, Science, Mathematics, Social Studies, Work Education/Home Economics; and questionnaires for pupils, teachers and school heads. With the exception of the non-verbal mental ability test which was administered only once, these instruments were administered in IMPACT and in control schools during both the initial evaluation and final evaluation from October 11 to 28, 1977 for the initial evaluation, and from February 20 to March 22, 1978 for the final evaluation.

During both the initial evaluation and final evaluation, the SOUTELE instruments were administered by an external group - a team of educational researchers from the Bureau of Elementary Education, Ministry of Education and Culture.

Scoring of the tests was undertaken by the University of the Philippines Computer Center. Processing and statistical treatment of test results and questionnaire data were done by the University of the Philippines Computer Center and INNOTECH. In the analysis of questionnaire data, percentages were computed. The statistical analysis relative to test development involved the computation of the following: biserial correlation, Kuder-Richardson formula #20, and standard error of measurement. The statistical measures used in the analysis of test results included the following, among others: t test for uncorrelated means to determine the significance of the difference in the mean achievement test scores of IMPACT and Non-IMPACT pupils in each subject for each level; and analysis of variance to test homogeneity and concurrence of regressions of the extent of growth/gains in achievement on initial scores in achievement tests for IMPACT and for Non-IMPACT, i.e., to compare the extent of growth/gains in the achievement of IMPACT pupils with that of Non-IMPACT pupils.

The salient findings of the study were as follows:

A. Characteristics of Pupils, Teachers and Schools

1. On Pupils

- a. In Levels IV, V and VI, there were bigger percentages of IMPACT pupils than of Non-IMPACT pupils who were overage and bigger percentages of Non-IMPACT pupils who were at the right age for their levels.
- b. The median educational attainment of family heads of IMPACT as well as of Non-IMPACT pupils in the three levels tested was completion of primary (elementary) education.

The family heads of Level IV IMPACT pupils had higher educational attainment than family heads of Level IV Non-IMPACT pupils, as indicated by a bigger percentage of Non-IMPACT family heads (73.2%) who finished at most elementary education, compared with a lower percentage for IMPACT family heads (64.4%). This indicates that a bigger percentage of IMPACT family heads had educational attainment beyond or higher than completion of primary (elementary) education.

In Level V and Level VI, the educational attainment of family heads of IMPACT pupils was approximately the same as that of family heads of Non-IMPACT pupils.

- c. Bigger percentages of IMPACT than of Non-IMPACT pupils spoke Pilipino at home. This was true for all levels tested.

The number of pupils who spoke English often at home was minimal. Approximately three-fifths to four-fifths of the pupils investigated did not speak English at home.

- d. The average monthly family income of IMPACT pupils was higher than that of Non-IMPACT pupils except in Levels V and VI in Sapang Palay.

## 2. On Teachers

- a. The IMPACT teachers were approximately of the same age as the Non-IMPACT teachers.

While the average number of years of teaching service of IMPACT teachers was slightly higher than that of Non-IMPACT teachers, their experience in the IMPACT system was much shorter than the experience of the Non-IMPACT teachers in the conventional system.

- b. Approximately one-third of IMPACT and of Non-IMPACT teachers were single.
- c. All the teachers in the IMPACT and Non-IMPACT schools included in the study were educationally qualified with

the exception of one teacher in the IMPACT group who had not earned the degree, Bachelor of Science in Elementary Education (BSEEd), the minimum educational attainment required of teachers in the Philippine elementary schools.

Fifty-four and five-tenths per cent of the teachers in the IMPACT schools had earned at least 15 units toward the Master's degree; in Non-IMPACT schools, 45.8 per cent.

- d. All the teachers, both IMPACT and Non-IMPACT, felt that they were at least good (Good and Excellent) in communicating with pupils in the dialect except for one IMPACT teacher who rated himself "Fair" in communicating in the dialect.

With regard to the use of Pilipino as a medium of instruction, 78.8 per cent of the IMPACT teachers considered themselves at least good. The corresponding percentage for the Non-IMPACT teachers was 85.7 per cent.

The percentage of IMPACT teachers who considered themselves either good or excellent in the use of English as a medium of instruction was 78.3, the same percentage of IMPACT teachers who rated themselves at least good in the use of Pilipino as a medium of instruction. A bigger

percentage of Non-IMPACT teachers, 97.1, considered themselves proficient in the use of English as a medium of instruction.

### 3. On Schools

School resource materials in IMPACT schools were more adequate than those in Non-IMPACT schools, especially with regard to the following: library readers, teacher's guides, lists of objectives, bulletins, supplementary readers, audio-visual materials and classroom equipment.

## B. School Personnel's Attitude Toward Educational Innovations

1. On the whole, IMPACT teachers had a more favorable attitude toward educational innovations than the Non-IMPACT teachers, as indicated by larger percentages of IMPACT teachers agreeing to most of the positive or favorable statements about innovations and smaller percentages of IMPACT teachers than of Non-IMPACT teachers agreeing to most of the negative or unfavorable statements about innovations. The same pattern holds for school heads in IMPACT and in Non-IMPACT schools.
2. Lack of funds was the most serious constraint to the implementation of innovations in the opinion of teachers and school heads in both IMPACT and Non-IMPACT schools.

C. Teachers' Perception of the Pupils' Level of Motivation

1. As of February-March 1978, the percentages of pupils perceived by their teachers to have from moderate to very high motivation were higher for IMPACT than for Non-IMPACT in all levels.
2. Except in Level VI, the bigger decreases in the percentages of IMPACT pupils with low and very low motivation from October 1977 to February-March 1978, as compared with those of Non-IMPACT pupils, reflect favorably on IMPACT. Moreover, even with the bigger decrease in percentage of pupils with low motivation among the Level VI Non-IMPACT pupils, the percentage of Level VI pupils with low and very low motivation in February-March 1978 was lower for IMPACT (14.50%) than for Non-IMPACT (23.35%).

D. Academic Achievement

1. Comparison of Mean Scores
  - a. The results of comparisons of means in achievement tests of IMPACT and of Non-IMPACT in the initial evaluation and final evaluation for the three sites combined and for Naga, Cebu are summarized by subject in Tables 23 and 24.

The interpretation of the summary of findings by subject is made first for the three sites combined, followed by that for Naga, Cebu.

Table 23

Summary Table Showing Consistency or Inconsistency of Results in the Comparison of Means in Achievement Tests of IMPACT and of Non-IMPACT in the Initial Evaluation and Final Evaluation for the Three Sites Combined

Achievement Tests	1. Consistent Results		2. Inconsistent Results	
	a. Means of IMPACT and of Non-IMPACT not significantly different in both initial evaluation and final evaluation	b. Means of IMPACT and of Non-IMPACT significantly different, in favor of IMPACT, in both initial evaluation and final evaluation	a. Means of IMPACT and of Non-IMPACT significantly different, in favor of IMPACT, in initial evaluation but not significantly different in final evaluation	b. Means of IMPACT and of Non-IMPACT not significantly different in initial evaluation, but significantly different, in favor of IMPACT, in final evaluation
1. Language	V		IV, VI	
2. Reading	IV		VI	V
3. <u>Mika</u>		V, VI	IV	
4. <u>Paobasa</u>		IV, V, VI		
5. Science			IV, V, VI	
6. Mathematics			IV, V, VI	
7. Social Studies - English	IV, V, VI			
8. <u>Araling Panlipunan*</u> (Social Studies in Filipino)			IV	
9. Work Education - English	V, VI			IV
10. <u>Edukasyong Panggawain*</u> (Work Education in Pil.)			IV	
11. Home Economics	V		VI	

\*Administered only to Level IV pupils in Sapang Palay

Table 24

Summary Table Showing Consistency or Inconsistency of Results in the Comparison of Means in Achievement Tests of IMPACT and of Non-IMPACT in the Initial Evaluation and Final Evaluation for Naga, Cebu

Achievement Tests	1. Consistent Results		2. Inconsistent Results	
	a. Means of IMPACT and of Non-IMPACT not significantly different in both initial evaluation and final evaluation	b. Means of IMPACT and of Non-IMPACT significantly different, in favor of IMPACT, in both initial evaluation and final evaluation	a. Means of IMPACT and of Non-IMPACT significantly different, in favor of IMPACT, in initial evaluation but not significantly different in final evaluation	b. Means of IMPACT and of Non-IMPACT not significantly different in initial evaluation, but significantly different, in favor of IMPACT, in final evaluation
1. Language	IV, V			VI
2. Reading	IV, V		VI	
3. <u>Wika</u>	IV, V		VI	
4. <u>Paqbasa</u>	V	VI		IV
5. Science		IV, V, VI		
6. Mathematics	IV		V, VI	
7. Social Studies - English	IV, V, VI			
8. Work Education - English	V, VI	IV		
9. Home Economics	VI	V		

(1) Language

In Level V, the means of IMPACT and of Non-IMPACT were not significantly different, i.e., they were comparable in both the initial evaluation and final evaluation for the three sites combined. However, in Levels IV and VI, IMPACT obtained significantly higher means in the initial evaluation but the means of IMPACT and of Non-IMPACT were comparable during the final evaluation.

In Naga, Cebu, Levels IV and V IMPACT and Non-IMPACT had comparable achievement in Language in both the initial evaluation and final evaluation. However, for the Level VI pupils, there was a change from comparable achievement of IMPACT and of Non-IMPACT in the initial evaluation to higher achievement of IMPACT in the final evaluation.

(2) Reading

In Reading, there was a different pattern for each level for the three sites combined. In Level IV, the means of IMPACT and of Non-IMPACT were not significantly different in both the initial evaluation and final evaluation. In Level VI, IMPACT scored significantly higher than Non-IMPACT in the initial

evaluation but in the final evaluation the performance of both groups was comparable. In Level V, the change was from comparable achievement of IMPACT and of Non-IMPACT in the initial evaluation to higher achievement of IMPACT in the final evaluation.

In Levels IV and V in Naga, Cebu, there was no significant difference in the Reading achievement of IMPACT and of Non-IMPACT in both the initial evaluation and final evaluation. In Level VI, IMPACT scored significantly higher in the initial evaluation but had comparable achievement as Non-IMPACT in the final evaluation.

(3) Wika (Language in Pilipino)

For the three sites combined, the means of IMPACT in Wika were significantly higher than those of Non-IMPACT in both the initial evaluation and final evaluation in Levels V and VI. In Level IV, while IMPACT scored significantly higher than Non-IMPACT in the initial evaluation, the two groups had comparable achievement in the final evaluation.

For Naga, Cebu, the means of IMPACT and of Non-IMPACT were comparable in both the initial evaluation and final evaluation in Levels IV and V.

In Level VI, IMPACT did significantly better in the initial evaluation but in the final evaluation the achievement of the two groups became comparable.

(4) Pagbasa (Reading in Pilipino)

In all the levels tested (IV, V, VI), the results indicate higher achievement of IMPACT in Pagbasa in both the initial evaluation and final evaluation for the three sites combined.

The consistently better performance of IMPACT in both the initial evaluation and final evaluation also holds true for Level VI in Naga, Cebu. In Level IV, there was a change from comparable achievement of IMPACT and of Non-IMPACT in the initial evaluation to the higher achievement of IMPACT in the final evaluation. In Level V, IMPACT and Non-IMPACT had comparable achievement in Pagbasa in both the initial evaluation and final evaluation.

(5) Science

The findings in Science for the three sites combined indicate that in the initial evaluation, the means of IMPACT were significantly higher than those of Non-IMPACT in all the levels tested (IV, V, VI). In the final evaluation, however, the means of the two groups were comparable.

In Naga, Cebu, IMPACT had significantly higher achievement than Non-IMPACT in Science in all the levels tested in both the initial evaluation and final evaluation.

(6) Mathematics

As was the case in Science, the means in Mathematics of IMPACT and of Non-IMPACT in all the levels tested (IV, V, VI) for the three sites combined were significantly different during the initial evaluation, in favor of IMPACT; in the final evaluation, there was no significant difference in the means of IMPACT and of Non-IMPACT in the three levels.

A similar pattern may be noted in Levels V and VI in Naga, Cebu; i. e., IMPACT had significantly higher achievement in the initial evaluation but the achievement of IMPACT and of Non-IMPACT became comparable in the final evaluation. In Level IV, there was no significant difference in the Mathematics achievement of IMPACT and of Non-IMPACT in both the initial evaluation and final evaluation.

(7) Social Studies-English

There was no significant difference in the achievement in Social Studies-English of IMPACT and of Non-

IMPACT in all the levels tested (IV, V, VI) in both the initial evaluation and final evaluation.

Similar results may be noted for Naga, Cebu.

(8) Araling Panlipunan (Social Studies in Pilipino)

The Level IV pupils were allowed to take either the Pilipino version or the English version of the Social Studies test. Only the Level IV pupils in Sapang Palay opted to take the test in Pilipino; the Level IV pupils in Naga, Cebu and in Lapu-Lapu City took the English version of the Social Studies test.

The results for Sapang Palay indicate significantly higher achievement for IMPACT in the initial evaluation but comparable achievement of IMPACT and of Non-IMPACT in the final evaluation.

(9) Work Education-English

Data for the three sites combined indicate comparable achievement of IMPACT and of Non-IMPACT in both the initial evaluation and final evaluation in Levels V and VI. In Level IV, while the achievement of IMPACT and of Non-IMPACT was comparable in the initial evaluation, IMPACT did significantly better in the final evaluation.

For Naga, Cebu, the pattern for Levels V and VI was similar to that for the three sites combined in the same levels, i. e., there was no significant difference in the achievement of IMPACT and of Non-IMPACT in both the initial evaluation and final evaluation also in Levels V and VI. In Level IV, IMPACT did significantly better than Non-IMPACT in both the initial evaluation and final evaluation.

(10) Edukasyong Panggawain (Work Education in Pilipino)

As was the case with Araling Panlipunan, only the Level IV pupils in Sapang Palay took the Work Education test in Pilipino; the Level IV pupils in Naga, Cebu and in Lapu-Lapu City took the English version of the test.

The results obtained were similar to the results on the Pilipino version of the Social Studies test, also administered only in Sapang Palay. While the means of IMPACT and of Non-IMPACT were significantly different in the initial evaluation, in favor of IMPACT, they were comparable during the final evaluation.

(11) Home Economics

The achievement in Home Economics of IMPACT and of Non-IMPACT was not significantly different in the initial evaluation and final evaluation in Level V for the three sites combined. In Level VI, the results indicate higher achievement of IMPACT in the initial evaluation but comparable achievement of the two groups in the final evaluation.

In Naga, Cebu, Level V IMPACT had higher achievement than Level V Non-IMPACT in both the initial evaluation and final evaluation. In Level VI, the achievement of IMPACT and of Non-IMPACT in both the initial evaluation and final evaluation was comparable.

From the data presented in Tables 23 and 24 and the corresponding interpretations of these data, the following salient observations may be made:

- (a) Data for the three sites combined indicate that except for Wika in Level IV, IMPACT did significantly better than Non-IMPACT in the Language Arts subjects in Pilipino (Wika and Pagbasa) in all levels tested in both the initial evaluation and final evaluation.

The performance of IMPACT in the Language Arts subjects in Pilipino in Naga, Cebu, a non-Tagalog speaking community, was also encouraging.

- (b) In Naga, Cebu, IMPACT scored consistently higher than Non-IMPACT in Science in all levels tested in both the initial evaluation and final evaluation.
- (c) The subjects in each of which there was a change from comparable achievement of IMPACT and of Non-IMPACT in the initial evaluation to higher achievement of IMPACT in the final evaluation were as follows: Reading in Level V and Work Education-English in Level IV for the three sites combined; and Language in Level VI and Pagbasa (Reading in Pilipino) in Level IV for Naga, Cebu.
- (d) For the three sites combined, IMPACT scored significantly higher than Non-IMPACT in Science and in Mathematics in all the levels tested during the initial evaluation. However, in the final evaluation, the achievement of IMPACT and of Non-IMPACT in these two subjects became comparable.
- (e) There was no significant difference in the achievement of IMPACT and of Non-IMPACT in Social Studies-English in the three levels tested (IV, V, VI) in both the initial

evaluation and final evaluation for the three sites combined as well as for Naga, Cebu. This implies that the IMPACT system and the conventional system are equally effective in the teaching of Social Studies-English.

(f) In the data analysis for the three sites combined and for Naga, Cebu, there was no single instance when Non-IMPACT did significantly better than IMPACT.

- b. The analysis by levels of mental ability during the initial evaluation involved twenty-eight comparisons (ten in Level IV and nine each in Level V and in Level VI) for each mental ability level (High, Average, Low).

Among pupils of high mental ability, six differences were statistically significant: five in Level IV (Language, Reading, Wika, Pagbasa and Work Education-English) in favor of Non-IMPACT; and one in Level V (Mathematics), in favor of IMPACT. In Level VI, differences between mean scores of IMPACT and of Non-IMPACT pupils of high mental ability were non-significant in all subjects tested.

This implies that for pupils of high mental ability, the conventional system is more effective than the IMPACT system

in the five aforementioned subjects in a lower level, Level IV. However, the advantage given by the conventional system to the high ability group in these subjects in Level IV was nullified beginning Level V. Furthermore, in Level V, IMPACT pupils of high mental ability performed significantly better in Mathematics than Non-IMPACT pupils of comparable ability. In Level VI, there was no significant difference in the achievement of IMPACT and of Non-IMPACT pupils of high mental ability in each of the subjects tested.

For pupils in the average and low ability groups, significant differences in mean scores were all in favor of IMPACT. IMPACT pupils of average mental ability scored significantly higher than Non-IMPACT pupils of comparable ability in eight tests: four in Level IV (Pagbasa, Science, Mathematics, and Social Studies-Pilipino); one in Level V (Pagbasa); and three in Level VI (Wika, Pagbasa, and Social Studies-English). Likewise, IMPACT pupils of low mental ability scored significantly higher than Non-IMPACT pupils, also of low mental ability, in seven tests: three in Level IV (Wika, Pagbasa and Science); one in Level V (Science); and three in Level VI (Wika, Pagbasa and Social Studies-English).

This means that for pupils of average ability, the IMPACT system is more effective than the conventional system in the eight aforementioned subjects. In the other subjects, the IMPACT system and the conventional system are equally effective for the average pupils. For pupils of low mental ability, the IMPACT system is likewise more effective in the seven subjects previously enumerated. In the remaining subjects, the IMPACT system is as effective as the conventional system for the low ability group.

It may be seen from the foregoing that the use of the conventional system does not result in relatively higher achievement for pupils of average and low mental ability. Neither does the use of the conventional system give a consistent or lasting advantage to pupils of high mental ability. On the other hand, the IMPACT system tends to help the average and slow learners achieve more, compared to the conventional system.

## 2. Comparison of Growth/Gains In Achievement

Data for Naga, Cebu, the original IMPACT site, were used in the analysis.

- a. All the obtained correlation coefficients between gains in achievement and initial scores were negative, a

- finding consistent with available research evidence that there is a negative correlation between growth/gains in achievement and pretest or initial test scores. This means that as the initial score increases, the amount of gain decreases; and, conversely, as the initial score decreases, the amount of gain increases.
- b. The correlation coefficients ranged from  $-0.10$  to  $-0.89$ . Nineteen or 73 per cent of the 26 obtained correlation coefficients for IMPACT indicate substantial or marked negative relationship. The same holds true for Non-IMPACT.
  - c. The IMPACT pupils made significantly bigger gains in achievement than the Non-IMPACT pupils in three of fourteen subjects for which statistical tests were made (Uika in Level V, Pagbasa in Level IV, and Work Education-English also in Level IV). For each of the remaining eleven subjects, there was not enough evidence to show a significant difference in the extent of growth/gains in the achievement of IMPACT and Non-IMPACT pupils.
  - d. The coefficients of correlation between growth/gains in achievement and scores in a non-verbal mental ability test ranged from  $-0.25$  to  $0.32$ . Twenty or

77 per cent of the 26 correlation values for IMPACT and 22 or 85 per cent of these values for Non-IMPACT indicate negligible linear relationship.

### Conclusions

On the basis of the results of the data analysis, the statistically significant findings and the trends that were established, the following conclusions may be drawn:

1. On the whole, the parents' education and average family income of IMPACT pupils are slightly higher than those of Non-IMPACT pupils.
2. Teachers in IMPACT schools are comparable to teachers in Non-IMPACT schools with regard to age, civil status, educational attainment and length of teaching experience.
3. IMPACT schools have a more adequate supply of school resource materials than the Non-IMPACT schools.
4. IMPACT teachers and school heads have a more favorable attitude toward educational innovations than the Non-IMPACT teachers and school heads.
5. Lack of funds is the most serious constraint to the implementation of innovations, in the opinion of teachers and school heads in both the IMPACT and Non-IMPACT schools.

6. IMPACT pupils are more highly motivated than the Non-IMPACT pupils as perceived by teachers of these pupils.
7. There is an inverse relationship between growth/gains in achievement as measured by achievement tests and initial scores in these tests. In other words, the lower the initial scores in an achievement test, the bigger the gains in achievement as measured by the same test; conversely, the higher the initial scores in the achievement test, the smaller the gains in achievement.
8. There is a negligible relationship between growth/gains in achievement and scores in a non-verbal mental ability test.
9. Pupils taught through the IMPACT system achieve as well as, or better than pupils taught through the conventional system.
10. There is a marked trend for IMPACT pupils to do better than the Non-IMPACT pupils in the Language Arts subjects in Pilipino (Wika and Pagbasa) and in Science and Mathematics.
11. The IMPACT system tends to help the average and slow learners achieve more compared to the conventional system. On the other hand, the use of the conventional system does not result in the higher achievement of the average and slow learners when comparisons are made with pupils of similar levels of ability taught through the

IMPACT system. For pupils of high mental ability, the IMPACT system and the conventional system tend to be equally effective.

The research findings clearly indicate higher achievement for pupils taught through the IMPACT system, compared to that of pupils taught through the conventional system, in Wika and Pagbasa, Language Arts subjects in Pilipino which are essential to the development of literacy skills. The IMPACT pupils also tend to do better than the Non-IMPACT pupils in Science and Mathematics, subjects necessary to the development of numeracy skills as well as a scientific outlook and an elementary understanding of the processes of nature. These findings suggest that the use of the IMPACT system is more conducive to meeting the children's minimum essential learning needs than the use of the conventional system.

The research findings likewise indicate that the use of the IMPACT system, as compared to the use of the conventional system, tends to result in higher achievement for the average and slow learners, who together constitute a very large segment of the school population. It may therefore be said that the IMPACT system is more effective than the conventional system in equalizing educational opportunity.

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APPENDIX A  
SUBJECTS OF THE STUDY

Table 1

Appendix A

Number and Per Cent of Pupils, Teachers and School Heads  
in IMPACT Schools Included in the Study\*

Sites/Schools	P u p i l s									Teach- ers	School Heads
	Level IV			Level V			Level VI				
	Enrol- ment	Number Tested	Per Cent Tested	Enrol- ment	Number Tested	Per Cent Tested	Enrol- ment	Number Tested	Per Cent Tested		
<u>Naga, Cebu</u>											
Naalad Elem. Sch.	62	52	83.9	4	4	100.0	5	5	100.0	2	1
Dalirong Elem. School	28	19	67.9	19	9	47.4	14	5	35.7	2	1
Lutac Elem. Sch.	10	10	100.0	13	5	38.5	8	4	50.0	2	1
Uling Elem. Sch.	26	12	46.15	17	14	82.4	16	7	43.8	2	1
Pangdan Elem. School	47	31	66.0	29	28	96.6	11	11	100.0	2	1
TOTAL	173	124	71.68	82	60	73.2	54	32	59.0	10(9)**	5(2)**
<u>Lapu-Lapu City</u>											
Gun-ob Elem. School	55	49	89.1	71	59	83.1	48	46	95.8	4	1
Babag Elem. Sch.	34	25	73.5	35	29	82.9	36	31	86.1	3	1
Mactan Air Base Elem. Sch.	62	54	87.1	57	51	89.5	48	40	83.3	4	1
TOTAL	151	128	84.8	163	139	85.3	132	117	88.6	11	3
<u>Sapang Palay, Bulacan</u>											
Bagong Buhay F Elem. Sch.	188	157	83.5	188	142	75.5	177	150	84.7	12	1
GRAND TOTAL	512	409	79.88	433	341	78.8	363	299	82.4	33	9

\* Data as of October 1977

\*\* Four school heads in Naga, Cebu were relocated to other schools in two supervisory districts in the School Year 1976-1977 and one Instructional Supervisor from Lutac was assigned to carry out supervisory functions in the five learning centers in Naga, Cebu. The corrected figures are in the parenthesis.

Table 2

Number and Per Cent of Pupils, Teachers and School Heads in  
in Non-IMPACT Schools Included in the Study\* Appendix A (cont'd)

Sites/Schools	P U P I L S									Teach- ers	School Heads
	Level IV			Level V			Level VI				
	Enrol- ment	Number Tested	Per Cent Tested	Enrol- ment	Number Tested	Per Cent Tested	Enrol- ment	Number Tested	Per Cent Tested		
<u>Naga, Cebu</u>											
Mainit Elem. Sch.	43	40	93.02	33	27	81.8	28	27	96.4	3	1
Cantao-an Elem. School	44	36	81.8	36	21	58.3	31	27	87.1	3	1
Lanas Elem. Sch.	20	14	70.0	14	9	64.3	11	11	100.0	2	1
TOTAL	107	90	86.5	83	57	68.7	69	65	94.2	8	3
<u>Lapu-Lapu City</u>											
Tiangue Elem. Sch.	30	16	53.3	23	22	78.6	25	18	72.0	4	1
Pajo Elem. School	110	90	81.8	117	109	93.2	98	93	94.9	8	1
Lock Elem. School	70	52	74.3	64	50	78.1	45	42	93.3	5	1
TOTAL	210	158	75.2	209	181	86.6	168	153	91.1	17	3
<u>Japanse Palay, Bulacan</u>											
Bagong Buhay B Elem. School	164	129	78.66	199	160	80.4	171	127	74.3	10	1
GRAND TOTAL	481	377	78.4	491	398	81.06	409	345	84.4	35	7

\* Data as of October 1977

Table 3

Number and Per Cent of Pupils, Teachers and School Heads  
in IMPACT Schools Included in the Study  
(February-March, 1978)

Sites/Schools	P U P I L S									Teach- ers	School Heads
	Level IV			Level V			Level VI				
	Enrol- ment	Number Tested	Per Cent Tested	Enrol- ment	Number Tested	Per Cent Tested	Enrol- ment	Number Tested	Per Cent Tested		
<u>Naga, Cebu</u>											
Naalad Elem. School	48	48	100	15	5	33	10	4	40	2	1
Balirong Elem. School	26	16	62	8	8	100	7	5	72	2	1
Lutac Elem. School	17	10	59	5	1	20	6	6	100	1	1
Uling Elem. School	69	12	17	15	14	93	8	6	75	2	1
Pangdan Elem. School	32	32	100	23	23	100	15	10	67	2	1
TOTAL	192	118	61	66	51	77	46	31	67	9	5 (2)*
<u>Lapu-Lapu City</u>											
Gun-ob Elem. School	57	43	75	69	54	78	48	45	94	4	1
Batag Elem. School	34	24	71	35	26	74	36	31	86	3	1
Mactan Air Base Elem.	62	56	90	54	47	87	47	44	94	4	1
TOTAL	153	123	80	158	127	80	131	120	92	11	3
<u>Sapang Palay, Bulacan</u>											
Bayang Buhay-F Elementary School	188	149	79	189	151	80	179	134	75	12	1
GRAND TOTAL	533	390	73	413	329	80	356	285	80	31	6

\*Four school heads in Naga, Cebu were relocated to other schools in two supervisory districts in the School Year 1976-1977 and one Instructional Supervisor from Lutac was assigned to carry out supervisory functions in the five learning centers in Naga, Cebu. The corrected figures are in the parenthesis.

Table 4

Number and Per Cent of Pupils, Teachers and School Heads  
in Non-IMPACT Schools Included in the Study  
(February-March 1978)

Sites/Schools	P U P I L S									Teachers	School Heads
	Enrol- ment	Number Tested	Per Cent Tested	Enrol- ment	Number Tested	Per Cent Tested	Enrol- ment	Number Tested	Per Cent Tested		
<u>Naga, Cebu</u>											
Mairit Elem. School	43	30	70	33	25	76	28	26	93	3	1
Centac-an Elem. Sch.	44	29	66	36	20	56	31	25	81	3	-
Lanas Elem. School	20	17	85	14	11	79	11	9	82	2	1
T o t a l	107	76	71	83	56	67	70	60	86	8	2
<u>Lapu-Lapu City</u>											
Tianque Elem. School	30	17	57	28	22	79	25	21	84	5	1
Pajo Elem. School	110	86	78	117	99	85	98	83	85	8	1
Lock Elem. School	70	51	73	64	47	73	45	41	91	5	1
T o t a l	210	154	73	209	168	80	168	145	86	18	3
<u>Sagay, Palay, Bulacan</u>											
Lawson Duhay-B Elementary School	164	129	79	199	165	83	171	139	81	14	1
GRAND TOTAL	481	359	75	491	389	79	409	344	84	40	6

APPENDIX B

MEANS AND STANDARD DEVIATIONS IN ACHIEVEMENT TESTS  
OF LEVELS IV, V AND VI IMPACT AND NON-IMPACT PUPILS  
BY SCHOOL, SITE AND FOR THE THREE SITES COMBINED

Means and Standard Deviations in Achievements  
by School, Site and fo

Achievement Tests	IMPACT								
	NAGA, CEBU						LAPU-LAPU CITY		
	Naalad	Balirong	Lutac	Uling	Pangdan	Total	Gun-ob	Babag	Mact Air B
1. Language (40*)									
N	40	13	9	12	26	100	42	24	51
M	14.22	16.15	13.78	16.42	11.96	14.11	13.62	19.17	16.7
SD	4.2	4.9	3.2	4.6	3.6	4.4	4.3	3.5	5
2. Reading (35*)									
N	40	13	7	12	27	99	43	25	51
M	9.22	9.46	7.71	8.08	7.89	8.65	9.42	12.88	12.0
SD	2.9	1.9	2.9	3	2.5	2.8	3	4.1	4.3
3. Wika (50*)									
N	52	19	9	12	28	120	47	23	54
M	13.37	16.63	14.44	15.75	13.46	14.22	16.79	18.83	22.4
SD	4.3	4.8	4.4	3.3	3.1	4.3	6.6	6.0	7.4
4. Pagbasa (40*)									
N	40	13	9	12	26	100	47	24	51
M	10.57	14.54	12.56	13	11.58	11.82	13.45	14.50	16.4
SD	3.2	5	3.7	1.8	2.7	3.6	4.6	4.3	6.7
5. Elem. Science(40*)									
N	52	19	10	12	28	121	46	23	54
M	13.52	18.84	14.40	15.08	11.57	14.13	14.24	17.70	19.7
SD	3.8	5.7	5.2	2.8	3.9	4.8	5.3	4.7	6.8
6. Elem. Math.(30*)									
N	52	19	10	12	28	121	46	23	54
M	6.42	9	8.80	8	8.43	7.64	7.65	9.61	10.0
SD	3.1	3.4	2.7	2.4	2.6	3.2	2.1	2.5	3.0
7. Soc.Stud.-Eng.(35*)									
N	52	19	10	12	28	121	46	23	46
M	9.65	10.11	7.20	8.50	9	9.26	9.74	9.48	11.3
SD	2.6	3.6	2.8	3.2	2.6	2.9	3.2	2.6	2.9
8. Soc.Stud.-Pil.(35*)									
N	.	.	.	.	.	.	.	.	.
M	.	.	.	.	.	.	.	.	.
SD	.	.	.	.	.	.	.	.	.
9. Work Educ.-Eng.(35*)									
N	52	19	10	12	28	121	46	23	54
M	9.19	11.84	8.60	12.33	8.32	9.67	10.57	11.39	10.7
SD	2.7	3.6	3.4	3	2.9	3.3	3.1	3.1	3
10. Work Educ.-Pil.(35*)									
N	.	.	.	.	.	.	.	.	.
M	.	.	.	.	.	.	.	.	.
SD	.	.	.	.	.	.	.	.	.

\*No. of test items

N = Number of pupils tested

M= Mean

SD= Standard Deviation

Table 5

Means and Standard Deviations in Achievement Tests of Level III-EGT and Non-IMPACT Pupils by School, Site and for the Three Sites Combined

IMPACT									NON-IMPACT			
CEBU			LAPU-LAPU CITY			Sapang Palay		GRAND TOTAL	NAGA, CEBU			
Uling	Pangdan	Total	Gun-ob	Babag	Macta Air B	Total	B-Buhay P		Mainit	Cantao-an	Lanas	Tc
12 16.42 4.6	26 11.96 3.6	100 14.11 4.4	42 13.62 4.3	24 19.17 3.5	51 16.76 5	117.0 16.13 4.9	136 14.54 4.1	353 14.95 4.6	39 13.03 4.5	31 13.58 4.2	14 11.43 3.2	84 12.0 4.
12 8.08 3	27 7.89 2.5	99 8.65 2.8	43 9.42 3	25 12.88 4.1	51 12.04 4.3	119 11.27 4.1	146 10.12 3.4	364 10.10 3.7	38 10.16 2.8	30 8.23 2.6	14 6.50 2.4	82 8. 3.
12 15.75 3.3	28 13.46 3.1	120 14.22 4.3	47 16.79 6.6	23 18.83 6.0	54 22.48 7.4	124 19.65 7.3	149 27.66 9.4	393 21.03 9.3	35 14.80 5.6	32 15.50 4.3	14 13.43 3.3	81. 14. 4.
12 13 1.8	26 11.56 2.7	100 11.82 3.6	47 13.45 4.6	24 14.50 4.3	51 16.47 5.7	122 14.92 5.7	135 22.47 7.4	357 16.90 7.4	39 10.62 3.4	31 12.42 4.0	14 10.36 2.3	84 11. 3.
12 15.08 2.8	28 11.57 3.9	121 14.13 4.8	46 14.24 5.3	23 17.70 4.7	54 19.74 6.8	123 17.31 6.4	149 16.66 5.8	393 16.08 5.9	34 11.38 4.4	32 12.47 4.1	14 10.29 3.3	80 11. 4.
12 8 2.4	28 8.43 2.6	121 7.64 3.2	46 7.65 2.1	23 9.61 2.5	54 10.06 3.0	123 9.07 2.9	149 9.21 3.3	393 8.68 3.2	35 6.74 2.9	32 7.87 2.6	14 7 2.4	81 7. 2.
12 8.50 3.2	28 9 2.6	121 9.26 2.9	46 9.74 3.2	23 9.48 2.6	46 11.30 2.9	115 10.31 3.1	41 10.59 2.6	277 9.89 3.0	32 8.53 2.6	30 10.13 2.7	14 3.64 3.1	76 9. 2.
12 12.33 3	28 8.32 2.9	121 9.67 3.3	46 10.57 3.1	23 11.39 3.1	54 10.70 3	123 10.78 3.1	41 14.32 4.1	285 10.82 3.7	35 7.97 2.2	30 9.10 3.0	14 9.07 2.1	79 8. 2
							107 14.46 3.9	107 14.46 3.9				

SD = Standard Deviation



Means and Standard Deviations in Achievement  
by School, Site and for

Achievement Tests	IMPACT								
	NAGA, CEBU						LAPU-LAPU CITY		
	Naalad	Balirong	Lutac	Uling	Pangdan	Total	Gun-ob	Babag	Mactan Air Base
1. Language (70*)									
N	3	8	2	14	25	52	55	29	44
M	20.33	17.38	21.00	19.21	20.72	19.79	20.53	19.59	21.55
SD	1.7	3.0	1.0	1.7	3.4	3.1	3.5	4.0	5.3
2. Reading (40*)									
N	3	8	1	14	25	51	54	29	44
M	11.33	10.37	16.00	9.50	10.16	10.20	10.31	10.34	11.36
SD	1.9	3.7	0.0	1.5	2.5	2.6	3.7	3.1	3.4
3. Wika (60*)									
N	3	8	2	14	24	51	55	28	44
M	22.67	15.62	15.50	16.57	13.54	15.31	15.31	16.32	19.02
SD	5.7	3.6	2.5	3.2	3.0	4.1	4.6	3.3	6.2
4. Pagbasa (50*)									
N	3	8	2	14	24	51	55	28	44
M	16.67	13.00	12.50	13.86	12.08	13.00	13.71	14.64	15.84
SD	1.2	3.7	1.5	1.7	2.4	2.7	3.8	4.2	4.9
5. Elem. Science (50*)									
N	4	9	3	14	27	57	57	28	49
M	17.50	17.22	14.33	15.00	14.63	15.32	15.89	14.25	16.67
SD	3.3	7.4	3.9	3.6	2.9	4.3	4.3	3.8	5.0
6. Elem. Math. (40*)									
N	4	9	3	14	27	57	57	28	49
M	10.25	11.67	12.33	10.36	11.30	11.11	9.46	9.86	10.82
SD	3.1	2.7	0.5	2.6	2.5	2.6	3.0	2.4	3.5
7. Soc.Stud.-Eng.(30*)									
N	4	9	3	14	27	57	54	29	46
M	10.00	10.56	7.67	8.64	8.30	8.82	8.85	9.41	10.91
SD	1.4	2.5	2.9	2.5	2.2	2.5	2.9	3.5	3.3
8. Work Educ.-Eng. (30*)									
N	1	6	3	6	14	30	29	9	25
M	14.00	8.50	8.00	9.17	8.86	8.93	8.66	8.56	10.00
SD	0.0	3.2	1.4	2.9	1.6	2.4	1.8	2.2	2.5
9. Home Economics (30*)									
N	3	3	3	8	13	30	28	19	24
M	10.00	9.33	7.33	7.25	9.62	8.77	8.43	8.37	10.37
SD	1.6	1.7	1.7	2.4	2.6	2.6	1.9	2.0	3.8

\*No. of test items

N = Number of pupils tested

M = Mean

SD = Standard Deviation

Table 6

Means and Standard Deviations in Achievement by School, Site and for

Tests of Level V IMPACT and Non-IMPACT Pupils the Three Sites Combined

IMPACT							NON-IMPACT				
BU			LAPU-LAPU CITY				Sapang Palay	GRAND TOTAL	NAGA, CEBU		
King	Pangdan	Total	Gun-ob	Babag	Mactan Air Base	Total	B-Buhay		Mainit	Cantao-an	Lanas
21.7	25.0	52.7	55	29	44	128	132	312	22	21	9
20.72	3.4	19.79	20.53	19.59	21.55	20.66	19.80	20.15	18.59	17.81	20.67
		3.1	3.5	4.0	5.3	4.3	4.7	4.3	4.4	3.1	3.9
50.5	25.0	51	54	29	44	127	132	310	22	21	9
10.16	2.5	10.20	10.31	10.34	11.36	10.69	10.93	10.71	9.86	10.10	10.33
		2.6	3.7	3.1	3.4	3.5	3.8	3.5	2.2	2.6	2.3
57.2	24.0	51	55	28	44	127	136	314	21	21	9
13.54	3.0	15.31	15.31	16.32	19.02	16.82	33.38	23.75	17.29	15.14	19.44
		4.1	4.6	3.3	6.2	5.2	9.1	11.0	5.5	3.8	4.1
86.7	24.0	51	55	28	44	127	133	311	21	21	9
12.08	2.4	13.00	13.71	14.64	15.84	14.65	22.64	17.80	14.24	13.24	11.22
		2.7	3.8	4.2	4.9	4.4	6.9	6.9	4.2	3.8	2.0
00.6	27.0	57	57	28.0	49	134	136	327	25	21	9
14.63	2.9	15.32	15.89	14.25	16.67	15.84	16.17	15.88	14.24	11.86	12.89
		4.3	4.3	3.8	5.0	4.6	4.9	4.7	4.5	3.4	4.1
0.36	27.0	57	57	28	49	134	136	327	25	21	9
11.30	2.5	11.11	9.46	9.86	10.82	10.04	10.72	10.51	9.40	9.76	11.11
		2.6	3.0	2.4	3.5	3.2	3.3	3.2	3.3	2.8	2.2
3.64	27.0	57	54	29	46.0	129	136	322	25	21	9
8.30	2.2	8.82	8.85	9.41	10.91	9.71	8.91	9.22	9.24	8.00	8.78
		2.5	2.9	3.5	3.3	3.3	2.7	3.0	2.6	1.7	2.8
9.17	14.0	30	29	9	25	63	63	156	12	12	4.0
8.86	1.6	8.93	8.66	8.56	10.00	9.17	8.98	9.05	9.67	8.25	9.75
		2.4	1.8	2.2	2.5	2.3	2.4	2.3	2.1	3.0	1.5
7.25	13.0	30	28	19	24	71	70	171	12	8	5
9.62	2.6	8.77	8.43	8.37	10.37	9.07	9.10	9.03	7.50	6.37	7.60
		2.6	1.9	2.0	3.8	2.9	3.5	3.1	3.6	1.4	1.9

SD = Standard Deviation

Mean

ests of Level V IMPACT and Non-IMPACT Pupils  
he Three Sites Combined

			NON-IMPACT									
		GRAND TOTAL	NAGA, CEBU				LAPU-LAPU CITY				Sapang Palay	GRAND TOTAL
Total	B-Buhay		Mainit	Cantao-an	Lanas	Total	Tiangue	Pajo	Look	Total	B-Buhay	
132	312	22	21	9	52	20	88	41	149	148	349	
0.66	19.80	20.15	18.59	17.81	20.67	18.63	18.75	20.28	20.68	20.19	19.05	19.47
4.3	4.7	4.3	4.4	3.1	3.9	4.0	3.3	4.9	4.2	4.6	4.1	4.3
132	310	22	21	9	52	20	92	41	153	147	352	
0.69	10.93	10.71	9.86	10.10	10.33	10.04	9.30	10.55	9.73	10.17	10.46	10.27
1.5	3.8	3.5	2.2	2.6	2.3	2.4	3.5	3.1	2.7	3.1	3.1	3.0
136	314	21	21	9	51	20	88	46	154	147	352	
0.82	33.38	23.75	17.29	15.14	19.44	16.78	17.30	17.05	17.41	17.19	28.67	21.93
0.2	9.1	11.0	5.5	3.8	4.1	4.9	4.2	5.1	5.4	5.1	9.0	9.0
133	311	21	21	9	51	20	88	41	149	148	348	
4.65	22.64	17.80	14.24	13.24	11.22	13.29	12.25	13.60	13.63	13.43	21.22	16.72
4.4	6.9	6.9	4.2	3.8	2.0	3.9	3.1	3.6	3.2	3.4	7.0	6.5
136	327	25	21	9	55	22	105	46	173	155	383	
0.84	16.17	15.88	14.24	11.86	12.89	13.11	14.18	14.41	14.02	14.28	14.91	14.37
0.6	4.9	4.7	4.5	3.4	4.1	4.2	3.6	4.3	3.9	4.2	4.0	4.2
136	327	25	21	9	55	22	104	46	172	155	382	
0.04	10.72	10.51	9.40	9.76	11.11	9.82	9.55	9.70	10.24	9.83	9.90	9.86
0.2	3.3	3.2	3.3	2.8	2.2	3.0	3.2	2.8	2.4	2.8	3.0	2.9
136	322	25	21	9	55	22	105	47	174	152	381	
0.71	8.91	9.22	9.24	8.00	8.78	8.69	9.41	9.90	9.53	9.74	8.34	9.03
0.3	2.7	3.0	2.6	1.7	2.8	2.4	3.1	3.3	2.8	3.1	2.8	3.0
63	156	12	12	4	28	9	56	27	92	75	195	
1.7	8.98	9.05	9.67	8.25	9.75	9.07	7.00	8.75	9.37	8.76	8.95	8.88
0.3	2.4	2.3	2.1	3.0	1.5	2.5	1.2	2.5	2.5	2.5	2.6	2.6
70	171	12	8	5	25	13	49	21	83	69	177	
0.07	9.10	9.03	7.50	6.37	7.60	7.16	8.85	9.27	9.90	9.36	9.01	8.92
0.9	3.5	3.1	3.6	1.4	1.9	2.8	2.6	3.3	2.7	3.1	2.8	3.0

Means and Standard Deviations in Achievement  
by School, Site and for

Achievement Tests	IMPACT								
	NAGA, CEBU						LAPU-LAPU CITY		
	Naalad	Balirong	Lutac	Uling	Pangdan	Total	Gun-ob	Babag	Mactan Air Base
1. Language (70*)									
N	5	4	4	7	9	29	37	30	40
M	27	17.75	21.75	20.43	20.11	21.28	23.24	20.53	25.30
SD	3.7	1.5	3.3	4.9	4.7	5.0	6.0	4.6	5.2
2. Reading (40*)									
N	5	4	3	7	9	28	37	30	40
M	14.20	11.50	13.33	7.86	11.0	11.11	12.19	12.17	14.32
SD	1.9	4	1.2	2.4	2.1	3.3	3.9	3.5	4.2
3. Wika (60*)									
N	5	4	4	7	9	29	37	29	40
M	22.40	16.50	17.75	19.29	17.89	18.79	21.73	18.79	28.57
SD	4.4	2.3	3.3	2.1	2.8	3.6	5.8	6.3	8.1
4. Pagbasa (50*)									
N	5	4	4	7	9	29	37	29	40
M	17.40	15.25	13.50	16.29	12.33	14.72	15.32	16.00	20.72
SD	5	2.2	1.1	3.6	2.3	3.7	4.6	5.8	7.6
5. Elem. Science (50*)									
N	5	5	4	7	11	32	45	27	40
M	22.60	15.60	17.50	16.71	15.82	17.25	19.18	17.96	20.27
SD	4.9	2.4	1.1	3.0	3.4	4.1	6.4	4.5	5.4
6. Elem.Math. (40*)									
N	5	5	4	7	11	32	45	27	40
M	13.20	12.80	9.50	11.14	11.27	11.56	10.42	9.96	12.42
SD	3.9	0.7	2.1	3.4	2.3	2.9	2.7	2.6	3.8
7. Soc. Stud.-Eng. (30*)									
N	5	5	4	7	11	32	45	27	38
M	12.60	10.80	8.50	10.71	8.36	9.94	11.89	10.33	11.66
SD	4.3	1.5	2.3	1.8	1.1	2.7	3.3	4.1	3.6
8. Work Educ.-Eng. (30*)									
N	0	1	4	5	9	19	16	16	21
M	0	5	10.25	10.00	9.22	9.42	10.87	8.69	10.43
SD	0	0	0.8	2.4	3.2	2.8	3.2	3.1	2.2
9. Home Economics (30*)									
N	5	4	4	2	2	17	26	11	19
M	13.40	12.50	6.50	9.00	12.00	10.88	12.12	10.09	11.74
SD	1.2	1.5	1.1	1	3	3.2	4.3	1.8	3.6

\*No. of test items

N = Number of pupils tested

M = Mean

SD = Standard Deviation

Table 7

Means and Standard Deviations in Achievement Tests of Level VI IMPACT and Non-IMPACT Pupils by School, Site and for the Three Sites Combined

IMPACT							NON-I				
, CEBU			LAPU-LAPU CITY				Sapang Palay	GRAND TOTAL	NAGA, CEBU		
Uling	Pangdian	Total	Gun-ob	Babag	Mactan Air Base	Total	B-Buhay F		Mainit	Cantao-an	Lanas
7	9	29	37	30	40	107	141	277	27	27	11
20.43	20.11	21.28	23.24	20.53	25.30	23.25	21.66	22.23	19.73	20.43	19.00
4.9	4.7	5.0	6.0	4.6	5.2	5.7	5.7	5.7	4.0	4.6	2.9
7	9	28	37	30	40	107	139	274	27	27	11
7.86	11.0	11.11	12.19	12.17	14.32	12.98	11.60	12.09	10.07	9.33	8.82
2.4	2.1	3.3	3.9	3.5	4.2	4.1	3.4	3.7	2.8	2.4	1.8
7	9	29	37	29	40	135	131	266	27	27	11
19.29	17.89	18.79	21.73	18.79	28.57	22.31	38.54	30.40	17.07	16.93	16.82
2.1	2.8	3.6	5.8	6.3	8.1	8.0	7.9	11.1	4.5	4.1	3.6
7	9	29	37	29	40	135	131	266	27	27	11
16.29	12.33	14.72	15.32	16.00	20.72	16.75	27.05	21.92	13.89	11.96	12.73
3.6	2.3	3.7	4.6	5.8	7.6	7.7	7.0	8.3	3.5	2.9	3.2
7	11	32	45	27	40	112	148	292	27	25	11
16.71	15.82	17.25	19.18	17.96	20.27	19.28	18.16	18.49	14.48	15.20	15.91
3.0	3.4	4.1	6.4	4.5	5.4	5.7	4.7	5.1	3.3	4.0	3.5
7	11	32	45	27	40	112	148	292	27	25	11
11.14	11.27	11.56	10.42	9.96	12.42	11.03	11.91	11.53	10.00	9.04	13.18
3.4	2.3	2.9	2.7	2.6	3.8	3.3	3.7	3.5	2.7	2.1	3.9
7	11	32	45	27	38	110	148	290	27	25	11
10.71	8.36	9.94	11.89	10.33	11.66	11.42	10.53	10.80	9.96	8.12	12.09
1.8	1.1	2.7	3.3	4.1	3.6	3.7	3.6	3.6	2.8	2.2	1.9
5	9	19	16	16	21	58	62	134	10	12	4
10.00	9.22	9.42	10.87	8.69	10.43	10.04	9.94	9.90	7.80	8.25	7.00
2.4	3.2	2.8	3.2	3.1	2.2	2.9	2.3	2.6	2.4	3.3	1.5
2	2	17	26	11	19	65	75	148	16	12	7
9.00	12.00	10.88	12.12	10.09	11.74	11.59	10.32	10.86	10.12	9.67	6.71
1	3	3.2	4.3	1.8	3.6	3.3	3.3	3.5	3.3	2.4	2.5

M = Mean

SD = Standard Deviation

Table 7  
 Tests of Level V-IMPACT and Non-IMPACT Pupils  
 at the Three Sites Combined

NON-IMPACT												
Total	Sapang Palay	GRAND TOTAL	NAGA, CEBU				LAPU-LAPU CITY				Sapang Palay	GRAND TOTAL
	B-Buhay F		Mainit	Cantao-an	Lanas	Total	Tiangue	Pajo	Look	Total	B-Buhay B	
107	141	277	27	27	11	65	17	90	38	145	99	309
23.25	21.66	22.23	19.73	20.43	19.00	19.94	21.29	22.47	21.53	22.08	19.98	20.96
5.7	5.7	5.7	4.0	4.6	2.9	4.1	5.0	6.0	4.9	5.7	4.6	5.2
107	139	274	27	27	11	65	17	90	38	145	99	309
12.98	11.60	12.09	10.07	9.33	8.82	9.55	11.29	11.92	11.50	11.74	11.41	11.17
4.1	3.4	3.7	2.8	2.4	1.8	2.6	3.6	4.2	3.6	4.0	3.2	3.6
107	131	266	27	27	11	65	17	90	39	146	92	303
13.51	38.54	30.40	17.07	16.93	16.82	16.97	19.47	19.73	19.62	19.67	33.28	23.22
8.0	7.9	11.1	4.5	4.1	3.6	4.2	6.6	7.3	4.6	6.6	8.3	9.5
107	131	266	27	27	11	65	17	90	39	146	92	303
7.75	27.05	21.92	13.89	11.96	12.73	12.89	12.76	15.62	15.44	15.24	23.82	17.34
6.7	7.0	8.3	3.5	2.9	3.2	3.3	2.9	5.4	3.2	4.7	7.6	7.0
107	148	292	27	25	11	63	18	92	39	149	97	309
19.28	18.16	18.49	14.48	15.20	15.91	15.02	16.28	17.67	17.21	17.38	16.64	16.67
5.7	4.7	5.1	3.3	4.0	3.5	3.7	5.7	5.5	4.8	5.4	4.6	4.9
107	148	292	27	25	11	63	18	91	39	148	97	308
11.03	11.91	11.53	10.00	9.04	13.18	10.17	10.28	11.35	11.08	11.15	10.90	10.87
3.3	3.7	3.5	2.7	2.1	3.9	3.1	3.7	3.7	3.6	3.7	3.2	3.4
107	148	290	27	25	11	63	18	91	39	148	97	308
11.42	10.53	10.80	9.96	8.12	12.09	9.60	11.83	11.22	10.82	11.19	9.80	10.43
3.7	3.6	3.6	2.8	2.2	1.9	2.8	4.6	4.1	3.0	3.9	3.4	3.6
107	62	134	10	12	4	26	6	48	20	74	43	143
10.04	9.94	9.90	7.80	8.25	7.00	7.88	9.33	9.29	11.05	9.77	9.53	9.36
2.9	2.3	2.6	2.4	3.3	1.5	2.8	2.1	3.2	4.0	3.5	2.7	3.2
107	75	148	16	12	7	35	12	44	20	76	48	159
1.59	10.32	10.86	10.12	9.67	6.71	9.29	11.92	10.66	10.35	10.78	9.46	10.05
3.3	3.3	3.5	3.3	2.4	2.5	3.1	4.5	3.7	3.9	3.9	3.5	3.7

APPENDIX C

MEAN PERCENTAGE SCORES OF LEVELS IV, V AND VI IMPACT  
AND NON-IMPACT PUPILS BY SUBJECT AREA FOR EACH SITE  
AND FOR THE THREE SITES COMBINED

Table P

Mean Percentage Scores in Achievement Tests of Levels IV, V and VI  
 IMPACT and Non-IMPACT Pupils\*  
 (Data for the Three Sites Combined)

SUBJECTS Tested	LEVEL IV					LEVEL V					Level VI				
	No. of Items	IMPACT		NON-IMPACT		No. of Items	IMPACT		NON-IMPACT		No. of Items	IMPACT		NON-IMPACT	
		Mean Score	Mean % Score	Mean Score	Mean % Score		Mean Score	Mean % Score	Mean Score	Mean % Score		Mean Score	Mean % Score	Mean Score	Mean % Score
Language	40	15.03	37.58	14.19	35.48	70	20.15	28.79	19.54	27.91	70	22.30	31.86	20.97	29.26
Reading	35	10.10	28.84	9.84	28.11	40	10.76	26.90	10.30	25.76	40	12.10	30.24	11.18	27.95
Wika	50	21.59	43.18	19.53	39.06	60	23.82	39.71	22.05	36.75	60	30.32	50.52	23.31	38.85
Tugbasa	40	17.01	42.52	14.64	36.61	50	17.89	35.78	16.71	33.42	50	21.89	43.78	17.38	34.76
Elementary Science	40	16.13	40.33	13.79	34.48	50	15.82	31.63	14.51	29.02	50	18.46	36.93	16.72	33.44
Elementary Mathematics	30	8.85	29.50	8.04	26.81	40	10.62	26.55	9.99	24.98	40	11.63	29.06	10.89	27.23
Social Studies-English	35	9.92	28.35	9.44	26.98	30	9.21	30.71	9.07	30.24	30	10.85	36.16	10.51	35.03
Social Studies-Pilipino	35	12.69	36.26	11.30	32.29										
Work Education-English	35	11.04	31.55	11.08	31.65	30	9.09	30.29	8.87	29.56	30	9.83	32.78	9.40	31.33
Work Education-Pilipino	35	14.46	41.32	12.99	37.10										
Home Economics						30	9.09	30.29	8.92	29.27	30	10.86	36.18	10.00	33.33

$$\text{Mean percentage score (Mean \% score)} = \frac{\text{Mean Score}}{\text{Total No. of Items}} \times 100$$

\* Data as of October 1977

Table 9

Mean Percentage Scores in Achievement Tests of Levels IV, V and VI  
IMPACT and Non-IMPACT Pupils in Naga, Cebu\*

Subjects Tested	LEVEL IV				LEVEL V				LEVEL VI						
	No. of Items	IMPACT		NON-IMPACT		No. of Items	IMPACT		NON-IMPACT		No. of Items	IMPACT		NON-IMPACT	
		Mean Score	Mean % Score	Mean Score	Mean % Score		Mean Score	Mean % Score	Mean Score	Mean % Score		Mean Score	Mean % Score	Mean Score	Mean % Score
Language	40	14.11	35.28	12.96	32.40	70	19.79	28.27	18.63	26.61	70	21.28	30.40	19.94	28.49
Reading	35	8.65	24.71	8.83	25.23	40	10.20	25.50	10.04	25.10	40	11.11	27.78	9.55	23.88
Wika	50	14.22	28.44	14.84	29.68	60	15.31	25.52	16.78	27.97	60	18.79	31.32	16.97	28.28
Pagbasa	40	11.82	29.55	11.24	28.10	50	13.00	26.00	13.29	26.58	50	14.72	29.44	12.89	25.78
Elem. Science	40	14.13	35.33	11.62	29.05	50	15.32	30.64	13.11	26.22	50	17.25	34.50	15.02	30.04
Elem. Mathematics	30	7.64	25.47	7.23	24.10	40	11.11	27.78	8.82	24.55	40	11.56	28.90	10.17	25.43
Soc. Studies-Eng.	35	9.26	26.46	9.18	26.23	30	8.82	29.40	8.69	28.97	30	9.94	33.13	9.60	32.00
Soc. Studies-Fil.*	35														
Work Education-Eng.	35	9.67	27.63	8.59	24.54	30	8.93	29.77	9.07	30.23	30	9.42	31.40	7.88	26.27
Work Education-Fil.*	35														
Home Economics						30	8.77	29.23	7.16	23.87	30	10.88	36.27	9.29	30.97

$$\text{Mean percentage score (Mean \% score)} = \frac{\text{Mean Score}}{\text{Total No. of Items}} \times 100$$

\*Pupils in Naga, Cebu did not take this test

\*Data as of October 1977

Table 10

APPENDIX C (Cont'd)

Mean Percentage Scores of Levels IV, V and VI IMPACT and Non-IMPACT Pupils  
by Subject Area for the Three Sites Combined  
in the February-March, 1978 Testing

Subjects Tested	LEVEL IV					LEVEL V					LEVEL VI				
	No. of Items	IMPACT		Non-IMPACT		No. of Items	IMPACT		Non-IMPACT		No. of Items	IMPACT		Non-IMPACT	
		Mean Score	Mean % Score	Mean Score	Mean % Score		Mean Score	Mean % Score	Mean Score	Mean % Score		Mean Score	Mean % Score	Mean Score	Mean % Score
Language	40	15.22	38.06	14.78	36.95	70	20.28	28.98	20.47	29.24	70	22.30	31.85	21.41	30.59
Reading	35	11.15	31.35	11.03	31.52	40	11.34	28.36	10.66	26.65	40	12.25	30.62	12.18	30.45
Wika	50	22.64	45.27	21.36	42.73	60	27.12	45.19	24.51	40.85	60	29.70	49.51	26.84	44.73
Pagbasa	40	17.50	43.76	15.79	39.46	50	19.16	38.31	17.82	35.65	50	21.28	42.56	19.89	39.79
Elementary Science	40	16.64	41.60	16.11	40.28	50	16.81	33.62	16.36	32.72	50	19.20	38.40	18.58	37.16
Elem. Mathematics	30	9.16	30.54	9.08	30.28	40	10.65	26.62	10.97	27.42	40	11.74	29.35	12.34	30.84
Social Studies- English	35	9.91	28.32	10.03	28.64	30	9.18	30.59	9.26	30.85	30	10.62	35.40	11.05	36.84
Social Studies- Filipino	35	12.60	35.99	11.98	34.24										
Work Education- English	35	11.35	32.42	10.68	30.51	30	8.96	29.86	9.28	30.93	30	10.34	34.48	10.63	35.44
Work Education- Filipino	35	15.99	45.67	15.67	44.78										
Home Economics	-					30	9.95	33.16	9.71	32.36	30	11.16	37.19	11.23	37.43

NOTE: Mean Percentage Score (Mean % Score) =  $\frac{\text{Mean Score}}{\text{Total No. of Items}} \times 100$

Mean Percentage Scores of Levels IV, V and VI IMPACT and Non-IMPACT Pupils  
by Subject Area for Naga, Cebu in the February-March, 1978 Testing

Subjects Tested	LEVEL IV				LEVEL V				LEVEL VI						
	No. of Items	IMPACT		Non-IMPACT		No. of Items	IMPACT		Non-IMPACT		No. of Items	IMPACT		Non-IMPACT	
		Mean Score	Mean % Score	Mean Score	Mean % Score		Mean Score	Mean % Score	Mean Score	Mean % Score		Mean Score	Mean % Score	Mean Score	Mean % Score
Language	40	14.84	37.10	13.93	34.82	70	19.12	27.32	19.07	27.24	70	22.26	31.80	19.88	28.40
Reading	35	9.69	27.68	10.00	28.57	40	11.06	27.66	10.00	25.00	40	11.16	27.90	10.65	26.62
Wika	50	15.86	31.73	15.74	31.49	60	18.61	31.02	18.52	30.87	60	19.36	32.26	19.09	31.81
Pagbasa	40	12.68	31.71	11.08	27.69	50	14.04	28.08	13.78	27.57	50	15.64	31.29	13.88	27.76
Elementary Science	40	14.87	37.18	13.44	33.61	50	17.49	34.98	14.67	29.33	50	19.61	39.23	16.59	33.19
Elem. Mathematics	30	8.80	29.32	8.77	29.23	40	10.98	27.45	10.80	26.99	40	12.16	30.40	12.03	30.08
Social Studies - English	35	9.31	26.60	9.71	27.74	30	8.82	29.41	8.46	28.21	30	10.45	34.84	10.34	34.46
Social Studies - Filipino*	35														
Work Education - English	35	10.90	31.40	9.21	26.32	30	8.88	29.58	8.74	29.12	30	9.71	32.38	9.08	30.27
Work Education - Filipino*	35														
Home Economics						30	10.08	33.60	8.07	26.90	30	12.12	40.39	10.54	34.48

NOTE: Mean Percentage Score (Mean % Score) =  $\frac{\text{Mean Score}}{\text{Total No. of Items}} \times 100$

\*Level IV pupils in Naga, Cebu did not take this test.

Mean Percentage Scores of Levels IV, V and VI IMPACT and Non-IMPACT Pupils  
by Subject Area for Lapu-Lapu City in the  
February-March, 1978 Testing

Subjects Tested	LEVEL IV				LEVEL V				LEVEL VI						
	No. of Items	IMPACT		Non-IMPACT		No. of Items	IMPACT		Non-IMPACT		No. of Items	IMPACT		Non-IMPACT	
		Mean Score	Mean % Score	Mean Score	Mean % Score		Mean Score	Mean % Score	Mean Score	Mean % Score		Mean Score	Mean % Score	Mean Score	Mean % Score
Language	40	16.41	41.02	15.55	38.88	70	20.09	28.70	21.34	30.49	70	23.10	33.00	22.58	32.26
Reading	35	12.46	35.57	11.07	31.64	40	11.18	27.95	10.69	26.73	40	12.52	31.30	13.41	33.53
Wika	50	21.24	42.48	17.34	34.68	60	21.02	35.04	19.76	32.94	60	23.20	38.81	23.68	39.47
Pagbasa	40	15.24	38.11	12.51	31.23	50	15.80	31.60	14.29	28.59	50	17.05	34.10	16.64	33.28
Elementary Science	40	18.84	47.34	16.96	42.40	50	17.28	34.57	17.28	34.55	50	20.80	41.59	20.32	41.64
Elem. Mathematics	30	9.02	30.06	8.96	29.86	40	10.17	25.43	10.68	26.69	40	11.74	29.35	12.81	32.04
Social Studies - English	35	10.56	30.16	10.18	29.09	30	9.68	32.27	10.18	33.93	30	11.35	37.84	12.37	41.22
Social Studies - Filipino*	35														
Work Education - English	35	11.73	33.52	11.34	32.41	30	8.91	29.71	9.65	32.16	30	10.90	36.32	11.63	38.77
Work Education - Filipino*	35														
Home Economics						30	9.83	32.78	10.90	36.34	30	12.14	40.45	12.82	42.74

NOTE: Mean Percentage Score (Mean % Score) =  $\frac{\text{Mean Score}}{\text{Total No. of Items}} \times 100$

\*Level IV pupils in Lapu-Lapu City did not take this test.

Table 13

Mean Percentage Scores of Levels IV, V and VI IMPACT and Non-IMPACT Pupils  
by Subject Area for Sapang Palay in the February-March, 1978 Testing

Subjects Tested	LEVEL IV				LEVEL V				LEVEL VI						
	No. of Items	IMPACT		NON-IMPACT		No. of Items	IMPACT		NON-IMPACT		No. of Items	IMPACT		NON-IMPACT	
		Mean Score	Mean % Score	Mean Score	Mean % Score		Mean Score	Mean % Score	Mean Score	Mean % Score		Mean Score	Mean % Score	Mean Score	Mean % Score
Language	40	14.55	36.38	14.33	35.83	70	20.82	29.74	19.96	28.52	70	21.59	30.84	20.87	29.81
Reading	35	11.20	32.00	11.49	32.82	40	11.57	28.93	10.80	27.00	40	12.25	30.64	11.57	28.92
Wika	50	29.44	58.89	29.14	58.29	60	35.28	58.80	30.81	51.34	60	38.09	63.49	33.28	55.47
Pagasa	40	23.15	57.89	22.12	55.29	50	23.61	47.23	22.49	44.98	50	26.31	52.62	25.66	51.51
Elementary Science	40	16.32	40.79	16.61	41.52	50	16.18	32.37	15.98	31.95	50	17.74	35.48	17.05	34.10
Elem. Mathematics	30	9.58	31.95	9.41	31.34	40	10.92	27.29	11.32	28.31	40	11.64	29.10	11.96	29.89
Social Studies - English*	35					30	8.89	29.65	8.56	28.53	30	10.04	33.46	9.96	33.21
Social Studies - Filipino	35	12.60	35.99	11.98	34.24										
Work Education - English	35					30	9.03	30.10	9.07	30.23	30	10.01	33.38	10.27	34.25
Work Education - Filipino	35	15.99	45.67	15.67	44.78										
Home Economics						30	10.00	33.33	8.87	29.90	30	10.10	33.67	9.88	32.92

NOTE: Mean Percentage Score (Mean % Score) =  $\frac{\text{Mean Score}}{\text{Total No. of Items}} \times 100$

\*Level IV pupils in Sapang Palay did not take this test.

APPENDIX D

SIGNIFICANCE OF DIFFERENCES IN THE ACHIEVEMENT TEST SCORES  
OF LEVELS IV, V AND VI IMPACT AND NON-IMPACT PUPILS  
FOR THE THREE SITES COMBINED AND FOR NAGA, CEBU

Table 14

Significance of Differences Between  
IMPACT and Non-IMPACT  
(For the Three

Subjects Tested	LEVEL IV						Number of Pupils Tested
	Number of Items	Number of Pupils Tested	Mean Scores	Difference	t	Significance	
1. Language	40						70
IMPACT		343	15.032	0.839	2.36	.05 S - I	
Non-IMPACT	326	14.193	338				
2. Reading	35						40
IMPACT		359	10.095	0.257	0.93	NS	
Non-IMPACT	327	9.338	345				
3. Wika (Language in Pil.)	50						60
IMPACT		357	21.588	2.057	2.88	.01 VS - I	
Non-IMPACT	316	19.532	340				
4. Pagbasa (Reading in Pil.)	40						50
IMPACT		343	17.006	2.362	4.08	.01 VS - I	
Non-IMPACT	326	14.644	337				
5. Elementary Science	40						50
IMPACT		356	16.132	2.342	5.55	.01 VS - I	
Non-IMPACT	315	13.790	350				
6. Elementary Mathematics	30						40
IMPACT		356	8.851	0.807	3.37	.01 VS - I	
Non-IMPACT	317	8.044	350				
7. Social Studies-English	35						30
IMPACT		243	9.922	0.478	1.78	NS	
Non-IMPACT	207	9.444	349				
8. Social Studies-Pilipino	35						30
IMPACT		91	12.692	1.389	2.89	.01 VS - I	
Non-IMPACT	99	11.303					
9. Work Education-English	35						30
IMPACT		251	11.044	0.35	0.10	NS	
Non-IMPACT	240	11.079	176				
10. Work Education-Pilipino	35						30
IMPACT		104	14.462	1.476	2.41	.05 S - I	
Non-IMPACT	73	12.986					
11. Home Economics							30
IMPACT							162
Non-IMPACT							166

Table 14

Significance of Differences between Means of Levels IV, V and VI  
 IMPACT and Non-IMPACT Pupils by Subject Area  
 (For the Three Sites Combined)

LEVEL IV						LEVEL V					
Subjects	Mean Scores	Difference	t	Significance	Number of Items Tested	Mean Scores	Difference	t	Significance	Number of Items	
	15.032				70					70	
	14.193	0.839	2.36	.05 S - I	305 338	20.151	0.613	1.78	NS		
	10.095				40					40	
	9.338	0.257	0.93	NS	305 345	10.761	0.457	1.80	NS		
	21.588				60					60	
	19.532	2.057	2.88	.01 VS - I	300 340	23.823	1.773	2.24	.05 S - I		
	17.006				50					50	
	14.644	2.362	4.08	.01 VS - I	303 337	17.891	1.179	2.22	.05 S - I		
	16.132				50					50	
	13.790	2.342	5.55	.01 VS - I	303 350	15.815	1.306	3.75	.01 VS - I		
	8.851				40					40	
	8.044	0.307	3.37	.01 VS - I	300 350	10.620	0.629	2.71	.01 VS - I		
	9.922				30					30	
	9.444	0.478	1.78	NS	299 349	9.214	0.142	0.61	NS		
	12.692										
	11.303	1.389	2.89	.01 VS - I							
	11.044				30					30	
	11.079	0.35	0.10	NS	139 176	9.086	0.217	0.78	NS		
	14.462										
	12.986	1.476	2.41	.05 S - I							
					30					30	
					162 166	9.086	0.170	0.50	NS		
						8.916					

## Appendix D

en Means of Levels IV, V and VI  
Pupils by Subject Area  
Sites Combined)

LEVEL V				LEVEL VI					
Mean Scores	Difference	t	Significance	Number of Items	Pupils Tested	Mean Scores	Difference	t	Significance
20.151 19.538	0.613	1.78	NS	70	271 304	22.303 20.974	1.329	2.93	.01 VS - I
10.761 10.304	0.457	1.80	NS	40	273 304	12.095 11.181	0.914	2.99	.01 VS - I
23.823 22.050	1.773	2.24	.05 S - I	60	260 295	30.115 23.312	7.004	7.98	.01 VS - I
17.891 16.712	1.179	2.22	.05 S - I	50	260 295	21.892 17.380	4.513	6.90	.01 VS - I
15.815 14.509	1.306	3.75	.01 VS - I	50	273 295	18.465 16.722	1.743	4.12	.01 VS - I
10.620 9.991	0.629	2.71	.01 VS - I	40	273 294	11.626 10.891	0.735	2.55	.05 S - I
9.214 9.072	0.142	0.61	NS	30	271 294	10.849 10.510	0.339	1.12	NS
9.086 8.869	0.217	0.78	NS	30	126 130	9.833 9.400	0.433	1.16	NS
9.086 8.916	0.170	0.50	NS	30	138 156	10.855 10.000	0.855	2.04	.05 S - I

Table 15

Significance of Differences Between  
IMPACT and Non-IMPACT Pupils

Subjects Tested	LEVEL IV						Number of Items Tested	Number of Pupils Tested
	Number of Items	Number of Pupils Tested	Mean Scores	Differ- ence	t	Signifi- cance		
1. Language	40						70	
IMPACT		100	14.11					52
Non-IMPACT		84	12.96	1.15	1.78	NS		42
2. Reading	35						40	
IMPACT		99	8.65					51
Non-IMPACT		82	8.83	-0.18	-0.414	NS		52
3. Wika (Language in Pil.)	50						60	
IMPACT		120	14.22					51
Non-IMPACT		81	14.84	-0.62	-0.956	NS		51
4. Pagbasa (Reading in Pil.)	40						50	
IMPACT		100	11.22					51
Non-IMPACT		84	11.24	.58	1.09	NS		51
5. Elementary Science	40						50	
IMPACT		121	14.13					57
Non-IMPACT		80	11.62	2.51	3.77	.01 VS		55
6. Elementary Mathematics	30						40	
IMPACT		121	7.64					57
Non-IMPACT		81	7.23	.41	.951	NS		55
7. Social Studies-English	35						30	
IMPACT		121	9.26					57
Non-IMPACT		76	9.18	.08	.100	NS		57
8. Social Studies-Pilipino*	35							
IMPACT								
Non-IMPACT								
9. Work Education-English	35						30	
IMPACT		121	9.67					30
Non-IMPACT		79	9.59	1.08	2.45	.05 S		28
10. Work Education-Pilipino*	35							
IMPACT								
Non-IMPACT								
11. Home Economics							30	
IMPACT								30
Non-IMPACT								25

\* Pupils in Naga, Cebu did not take this test.

Table 15  
Significance of Differences Between Means of Levels IV, V and VI IMPACT  
and Non-IMPACT Pupils by Subject Area in Naga, Cebu

LEVEL IV					LEVEL V				
Mean Scores	Difference	t	Significance	Number of Items Pupils Tested	Mean Scores	Difference	t	Significance	Number of Items
14.11 12.96	1.15	1.78	NS	70 52 52	19.79 18.63	1.16	1.65	NS	70
9.65 9.83	-0.18	-.414	NS	40 51 52	10.20 10.04	.16	.321	NS	40
14.22 14.84	-0.62	-.956	NS	60 51 51	15.31 16.78	-1.47	-1.64	NS	60
11.22 11.24	.50	1.09	NS	50 51 51	13.00 13.29	-.29	-.44	NS	50
14.13 11.62	2.51	3.77	.01 VS	50 57 55	15.32 13.11	2.21	2.71	.01 VS	50
7.64 7.23	.41	.951	NS	40 57 55	11.11 9.82	1.29	2.41	.05 S	40
9.26 9.10	.08	.100	NS	30 57 57	8.82 8.69	.13	.280	NS	30
9.67 9.59	1.08	2.45	.05 S	30 30 28	8.93 9.07	-.14	-.193	NS	30
				30 30 25	8.77 7.16	1.61	2.16	.05 S	30

Appendix D (Cont'd)

Means of Levels IV, V and VI IMPACT  
by Subject Area in Naga, Cebu

LEVEL V				LEVEL VI					
Mean Scores	Difference	t	Significance	Number of Items	Pupils Tested	Mean Scores	Difference	t	Significance
19.79 18.63	1.16	1.65	NS	70	29 65	21.28 19.94	1.34	1.35	NS
10.20 10.04	.16	.321	NS	40	28 65	11.11 9.55	1.56	2.43	.05 S
15.31 16.78	-1.47	-1.64	NS	60	29 65	13.79 16.97	1.82	2.02	.05 S
13.00 13.29	-.29	-.44	NS	50	29 65	14.72 12.89	1.83	2.36	.05 S
15.32 13.11	2.21	2.71	.01 VS	50	32 63	17.25 15.02	2.23	2.68	.01 VS
11.11 9.82	1.29	2.41	.05 S	40	32 63	11.56 10.17	1.39	2.04	.05 S
8.82 8.69	.13	.280	NS	30	32 63	9.94 9.60	.34	.564	NS
8.93 9.07	-.14	-.193	NS	30	19 26	9.42 7.88	1.54	1.77	NS
8.77 7.16	1.61	2.16	.05 S	30	17 35	10.88 9.27	1.61	1.69	NS

APPENDIX E

Significance of Differences Between Means of  
Levels IV, V and VI IMPACT and Non-IMPACT Pupils  
Classified by Levels of Mental Ability  
in the October 1977 Evaluation

Significance of Differences Between Means of 1  
Classified by Levels of Mental Ability

Subjects Tested* by Group	LOW					AVERAGE				Lev Sig ca
	No. of Pupils Tested (n)	Mean ( $\bar{X}$ )	Differ- ence (D)	t	Level of Signifi- cance**	No. of Pupils Tested (n)	Mean ( $\bar{X}$ )	Differ- ence (D)	t	
1. Language (40) IMPACT Non-IMPACT	62 118	12.887 12.373	.514	.78	NS	173 147	14.757 13.993	.764	1.66	
2. Reading (35) IMPACT Non-IMPACT	65 118	9.138 8.551	.588	1.21	NS	180 148	9.822 9.635	.187	.52	
3. Wika (Language in Pilipino) (50) IMPACT Non-IMPACT	68 113	16.382 14.230	2.152	2.60	.01	178 144	21.169 19.507	1.662	1.70	
4. Pagbasa (40) IMPACT Non-IMPACT	63 118	13.476 11.068	2.408	3.50	.01	174 147	16.454 13.653	2.801	3.30	
5. Science (40) IMPACT Non-IMPACT	67 112	12.821 11.616	1.205	2.01	.05	178 144	15.376 13.271	2.106	3.98	
6. Mathematics (30) IMPACT Non-IMPACT	67 113	8.030 7.239	.791	1.71	NS	178 145	8.730 7.862	.868	2.77	
7. Social Studies- English (35) IMPACT Non-IMPACT	54 93	9.278 9.161	.116	.26	NS	119 93	9.941 9.527	.414	1.06	
8. Araling Panlipunan (Social Studies in Pilipino) (35) IMPACT Non-IMPACT	10 19	11.700 10.105	1.595	1.53	NS	47 45	11.809 10.578	1.231	2.00	
9. Work Education- English (35) IMPACT Non-IMPACT	55 92	9.527 9.446	.082	.14	NS	128 103	10.805 10.670	.135	.30	
10. Edukasyon; Panggawain (Work Educ. in Pilipino) (35) IMPACT Non-IMPACT	13 20	11.077 10.500	.577	.49	NS	42 39	14.167 13.051	1.115	1.42	

\*Number of test items is in the parenthesis.

\*\*The significant differences are all in favor of IMPACT.

NS means not significant at the .05 level.

Table 10

Significance of Differences Between Means of Level IV IMPACT and Non-IMPACT Pupils  
Classified by Levels of Mental Ability in the October 1977 Evaluation

Level of Signifi- cance**	AVERAGE					Level of Signifi- cance**	HIGH					No. P. T. ( )
	No. of Pupils Tested (n)	Mean ( $\bar{X}$ )	Differ- ence (D)	t			No. of Pupils Tested (n)	Mean ( $\bar{X}$ )	Differ- ence (D)	t	Level of Signifi- cance**	
.78 NS	173 147	14.757 13.993	.764	1.66		NS	108 61	16.704 18.197	1.493	2.03	.05	
.21 NS	180 148	9.822 9.635	.187	.52		NS	114 61	11.070 12.820	1.749	2.76	.01	
.60 .01	178 144	21.169 19.507	1.662	1.70		NS	111 59	25.450 29.746	4.295	2.85	.01	
.50 .01	174 147	16.454 13.653	2.801	3.30		.01	106 61	20.009 23.951	3.941	2.97	.01	
.01 .05	178 144	15.376 13.271	2.106	3.98		.01	111 59	19.342 19.186	.156	.16	NS	
1.71 NS	178 145	8.730 7.862	.868	2.77		.01	111 59	9.541 10.034	.493	.91	NS	
.26 NS	119 93	9.941 9.527	.414	1.06		NS	70 21	10.386 10.333	.052	.07	NS	
1.53 NS	47 45	11.809 10.578	1.231	2.00		.05	34 35	14.206 12.886	1.320	1.57	NS	
.14 NS	128 103	10.805 10.670	.135	.30		NS	68 45	12.721 15.356	2.635	3.88	.01	
.49 NS	42 39	14.167 13.051	1.115	1.42		NS	43 14	15.814 16.357	.543	.45	NS	

## Appendix E

IV IMPACT and Non-IMPACT Pupils  
the October 1977 Evaluation

No. of Pupils Tested (n)	HIGH					TOTAL				
	Mean ( $\bar{X}$ )	Differ- ence (D)	t	Level of Signifi- cance**		No. of Pupils Tested (n)	Mean ( $\bar{X}$ )	Differ- ence (D)	t	Level of Signifi- cance**
108 61	16.704 18.197	1.493	2.03	.05		343 326	15.032 14.193	.839	2.36	.05
114 61	11.070 12.820	1.749	2.76	.01		359 327	10.095 9.838	.257	.93	NS
111 59	25.450 29.746	4.295	2.85	.01		357 316	21.588 19.532	2.057	2.88	.01
106 61	20.009 23.951	3.941	2.97	.01		343 326	17.006 14.644	2.362	4.08	.01
111 59	19.342 19.186	.156	.16	NS		356 315	16.132 13.790	2.342	5.55	.01
111 59	9.541 10.034	.493	.91	NS		356 317	8.851 8.044	.807	3.37	.01
70 21	10.386 10.333	.052	.07	NS		243 207	9.922 9.444	.477	1.78	NS
34 35	14.206 12.886	1.320	1.57	NS		91 99	12.692 11.303	1.389	2.89	.01
68 45	12.721 15.356	2.635	3.88	.01		251 240	11.044 11.079	.035	.10	NS
43 14	15.814 16.357	.543	.45	NS		104 73	14.462 12.986	1.475	2.41	.05

Significance of Differences Between Means,  
Classified by Levels of Mental Ability

Subjects Tested* by Group	LOW					AVERAGE			
	No. of Pupils Tested (n)	Mean ( $\bar{X}$ )	Difference (D)	t	Level of Significance**	No. of Pupils Tested (n)	Mean ( $\bar{X}$ )	Difference (D)	t
1. Language (70) IMPACT	65	19.046				135	19.637		
Non-IMPACT	103	18.806	.240	.38	NS	153	18.902	.735	1.51
2. Reading (40) IMPACT	65	10.077				135	10.570		
Non-IMPACT	110	9.873	.204	.44	NS	153	10.085	.485	1.30
3. Wika (Language in Filipino) (60) IMPACT	64	17.984				134	22.052		
Non-IMPACT	104	16.875	1.109	1.23	NS	154	20.708	1.344	1.30
4. Pagbasa (50) IMPACT	64	14.141				135	16.970		
Non-IMPACT	102	13.490	.650	1.03	NS	153	15.627	1.343	2.16
5. Science (50) IMPACT	66	15.030				131	15.115		
Non-IMPACT	114	12.719	2.311	3.99	.01	152	14.691	.424	.87
6. Mathematics (40) IMPACT	66	9.530				131	10.489		
Non-IMPACT	114	9.518	.013	.03	NS	154	10.020	.469	1.37
7. Social Studies- English (30) IMPACT	63	9.063				131	8.634		
Non-IMPACT	117	8.590	.474	.99	NS	149	9.027	.393	1.27
8. Work Education- English (30) IMPACT	34	8.500				61	9.148		
Non-IMPACT	61	7.918	.582	1.44	NS	72	9.042	.106	.25
9. Home Economics (30) IMPACT	32	8.094				70	8.914		
Non-IMPACT	53	8.038	.056	.09	NS	74	8.973	.059	.13

\*Number of test items is in the parenthesis.

\*\*The significant differences are all in favor of IMPACT.

NS means not significant at the .05 level.

Table 17

Significance of Differences Between Means of Level V IMPACT and Non-IMPACT Pupils  
Classified by Levels of Mental Ability in the October 1977 Evaluation

t	Level of Significance**	AVERAGE				Level of Significance**	HIGH				
		No. of Pupils Tested (n)	Mean ( $\bar{X}$ )	Difference (D)	t		No. of Pupils Tested (n)	Mean ( $\bar{X}$ )	Difference (D)	t	Level of Significance**
.38	NS	135	19.637	.735	1.51	NS	105	21.495	.151	.22	NS
		153	18.902				82	21.646			
.44	NS	135	10.570	.485	1.39	NS	105	11.429	.136	.25	NS
		153	10.085				82	11.293			
1.23	NS	134	22.052	1.344	1.30	NS	102	29.814	1.320	.84	NS
		154	20.708				82	31.134			
1.03	NS	135	16.970	1.343	2.16	.05	104	21.394	1.350	1.15	NS
		153	15.627				82	22.744			
3.99	.01	131	15.115	.424	.87	NS	106	17.170	.563	.78	NS
		152	14.691				84	16.607			
.03	NS	131	10.489	.469	1.37	NS	106	11.462	.879	1.98	.05
		154	10.020				84	10.583			
.99	NS	131	8.634	.393	1.27	NS	105	10.029	.197	.41	NS
		149	9.027				83	9.831			
1.44	NS	61	9.148	.106	.25	NS	44	9.455	.476	.80	NS
		72	9.042				43	9.930			
.09	NS	70	8.914	.059	.13	NS	60	9.817	.183	.24	NS
		74	8.973				39	10.000			

NS.  
Non-IMPACT.

Level V IMPACT and Non-IMPACT Pupils  
by in the October 1977 Evaluation

Level of Significance**	HIGH					TOTAL				
	No. of Pupils Tested (n)	Mean ( $\bar{X}$ )	Difference (D)	t	Level of Significance**	No. of Pupils Tested (n)	Mean ( $\bar{X}$ )	Difference (D)	t	Level of Significance**
NS	105 82	21.495 21.646	.151	.22	NS	305 333	20.151 19.538	.612	1.78	NS
NS	105 82	11.429 11.293	.136	.25	NS	305 345	10.761 10.304	.456	1.80	NS
NS	102 82	29.814 31.134	1.320	.84	NS	300 340	23.823 22.050	1.773	2.24	.05
.05	104 82	21.394 22.744	1.350	1.15	NS	303 337	17.891 16.712	1.179	2.22	.05
NS	106 84	17.170 16.607	.563	.78	NS	303 350	15.815 14.509	1.307	3.75	.01
NS	106 84	11.462 10.583	.879	1.98	.05	303 350	10.620 9.991	.629	2.71	.01
NS	105 83	10.029 9.831	.197	.41	NS	299 349	9.214 9.072	.142	.61	NS
NS	44 43	9.455 9.930	.476	.80	NS	139 176	9.086 9.869	.217	.78	NS
NS	60 39	9.817 10.000	.183	.24	NS	162 166	9.036 8.916	.171	.50	NS

Significance of Differences Between Means  
Classified by Levels of Mental Ability

Subjects Tested* by Group	LOW					AVERAGE			
	No. of Pupils Tested (n)	Mean ( $\bar{X}$ )	Difference (D)	t	Level of Significance**	No. of Pupils Tested (n)	Mean ( $\bar{X}$ )	Difference (D)	t
1. Language (70) IMPACT	42	20.571				124	20.847		
Non-IMPACT	117	19.402	1.170	1.66	NS	120	20.517	.330	.56
2. Reading (40) IMPACT	44	11.000				124	11.137		
Non-IMPACT	177	10.333	.667	1.22	NS	120	10.667	.470	1.19
3. Wika (Language in Pilipino) (60) IMPACT	40	24.850				177	29.009		
Non-IMPACT	114	18.088	6.762	5.36	.01	116	23.707	5.302	4.19
4. Pagbasa (50) IMPACT	40	18.400				117	20.453		
Non-IMPACT	114	13.737	4.663	6.14	.01	116	17.259	3.194	3.53
5. Science (50) IMPACT	45	15.111				123	17.244		
Non-IMPACT	112	14.170	.941	1.65	NS	117	16.752	.492	1.01
6. Mathematics (40) IMPACT	45	10.556				123	10.862		
Non-IMPACT	112	10.161	.395	.73	NS	118	11.008	.147	.36
7. Social Studies- English (30) IMPACT	44	10.068				122	9.975		
Non-IMPACT	111	8.973	1.095	2.11	.05	117	10.812	.837	2.07
8. Work Education- English (30) IMPACT	15	9.133				56	9.607		
Non-IMPACT	57	8.526	.607	.71	NS	47	9.617	.010	.02
9. Home Economics (30) IMPACT	26	9.692				62	9.935		
Non-IMPACT	49	8.592	1.100	1.56	NS	70	9.700	.235	.43

\*Number of test items is in the parenthesis.

\*\*The significant differences are all in favor of IMPACT.  
NS means not significant at the .05 level.

15  
Table 10

Significance of Differences Between Means of Level VI IMPACT and Non-IMPACT Pupils  
Classified by Levels of Mental Ability in the October 1977 Evaluation

Level of Signifi- cance**	No. of Pupils Tested (n)	AVERAGE			Level of Signifi- cance**	HIGH			Level of Signifi- cance**	No. Pup Tes (n)	
		Mean ( $\bar{X}$ )	Differ- ence (D)	t		No. of Pupils Tested (n)	Mean ( $\bar{X}$ )	Differ- ence (D)			t
.66 NS	124 120	20.847 20.517	.330	.56	NS	105 67	24.714 24.537	.177	.17	NS	27 30
.22 NS	124 120	11.137 10.667	.470	1.19	NS	105 67	13.686 13.582	.104	.16	NS	27 30
.36 .01	177 116	29.009 23.707	5.302	4.19	.01	103 65	33.922 31.769	2.153	1.23	NS	26 29
.14 .01	117 116	20.453 17.259	3.194	3.53	.01	103 65	24.883 23.985	.899	.64	NS	26 29
.55 NS	123 117	17.244 16.752	.492	1.01	NS	105 66	21.333 21.000	.333	.36	NS	27 29
.73 NS	123 118	10.862 11.008	.147	.36	NS	105 64	12.981 11.953	1.028	1.74	NS	27 29
.1 .05	122 117	9.975 10.812	.837	2.07	.05	105 66	12.190 12.561	.370	.58	NS	27 29
.1 NS	56 47	9.607 9.617	.010	.02	NS	55 26	10.255 10.923	.669	.89	NS	11 11
.6 NS	62 70	9.935 9.700	.235	.43	NS	50 37	12.600 12.432	.168	.20	NS	11 11

of IMPACT.

Appendix E (Cont'd)

Level VI IMPACT and Non-IMPACT Pupils  
in the October 1977 Evaluation

Level of Significance**	HIGH					TOTAL				
	No. of Pupils Tested (n)	Mean ( $\bar{X}$ )	Difference (D)	t	Level of Significance**	No. of Pupils Tested (n)	Mean ( $\bar{X}$ )	Difference (D)	t	Level of Significance**
NS	105 67	24.714 24.537	.177	.17	NS	271 304	22.303 20.974	1.329	2.93	.01
NS	105 67	13.686 13.582	.104	.16	NS	273 304	12.095 11.181	.914	2.99	.01
.01	103 65	33.922 31.769	2.153	1.23	NS	260 295	30.315 23.312	7.004	7.98	.01
.01	103 65	24.883 23.985	.899	.64	NS	260 295	21.892 17.380	4.513	6.90	.01
NS	105 66	21.333 21.000	.333	.36	NS	273 295	18.465 16.722	1.743	4.12	.01
NS	105 64	12.981 11.953	1.028	1.74	NS	273 294	11.626 10.891	.735	2.55	.05
.05	105 66	12.190 12.561	.370	.58	NS	271 294	10.849 10.510	.339	1.12	NS
NS	55 26	10.255 10.923	.669	.89	NS	126 130	9.833 9.400	.433	1.16	NS
NS	50 37	12.600 12.432	.168	.20	NS	138 156	10.855 10.700	.855	2.04	.05

APPENDIX F

RESULTS OF ANALYSIS OF VARIANCE TO TEST HOMOGENEITY  
OF REGRESSIONS AND POSITIONS FOR IMPACT AND  
NON-IMPACT PUPILS IN NAGA, CEBU

Table 19

RESULTS OF ANALYSIS OF VARIANCE TO TEST HOMOGENEITY  
OF REGRESSIONS FOR IMPACT AND NON-IMPACT PUPILS IN NAGA, CEBU

Reading, Level IV

Sources of Variations	df	SS	MS	F
Regression, over-all	1	746.2352		
Difference of positions	1	3.7447	3.7447	0.2745 NS
Difference of regressions	1	4.3100	4.3100	0.3159 NS
Error, combined	125	1705.2605	13.6421	
Total, over-all	128	2459.5504		

NS - not significant at the .05 level

Estimated common regression equation:  $\hat{Y}_i = 8.74 - .84X_i$

Reading, Level V

Sources of Variations	df	SS	MS	F
Regression, over-all	1	248.9243		
Difference of positions	1	29.6474	29.6474	3.0560 NS
Difference of regressions	1	0.7171	0.7171	0.0739 NS
Error, combined	70	679.0896	9.7013	
Total, over-all	73	958.3784		

NS - not significant at the .05 level

Estimated common regression equation:  $\hat{Y}_i = 8.74 - .81X_i$

Reading, Level VI

Sources of Variations	df	SS	MS	F
Regression, over-all	1	327.0505		
Difference of positions	1	1.7195	1.7195	0.1650 NS
Difference of regressions	1	0.0887	0.0887	0.0085 NS
Error, combined	76	791.8913	10.4196	
Total, over-all	79	1120.7500		

NS - not significant at the .05 level

Estimated common regression equation:  $\hat{Y}_i = 8.25 - .72X_i$

Wika, Level V

Sources of Variations	df	SS	MS	F
Regression, over-all	1	350.9828		
Difference of positions	1	253.7232	253.7232	18.1725**
Difference of regressions	1	5.6120	5.6120	0.4020 NS
Error, combined	74	1033.1820	13.9619	
Total, over-all	77	1643.5000		

NS - not significant at the .05 level

\*\* - significant at the .01 level

Estimated regression equations: IMPACT:  $\hat{Y}_i = 10.30 + .45X_i$

NON-IMPACT:  $\hat{Y}_i = 7.80 + .45X_i$

Pagbasa (Reading in Pilipino), Level IV

Sources of Variations	df	SS	MS	F
Regression, over-all	1	218.4148		
Difference of positions	1	460.9363	460.9363	30.3140 **
Difference of regressions	1	1.3560	1.3560	0.0892 NS
Error, combined	132	2007.1091	15.2054	
Total, over-all	135	2687.8162		

NS - not significant at the .05 level

\*\* - significant at the .01 level

Estimated regression equations: IMPACT:  $\hat{Y}_i = 8.12 - .58X_i$   
 NON-IMPACT:  $\hat{Y}_i = 5.92 - .58X_i$

Pagbasa (Reading in Pilipino), Level VI

Sources of Variations	df	SS	MS	F
Regression, over-all	1	389.6194		
Difference of positions	1	5.4898	5.4898	0.5729 NS
Difference of regressions	1	14.4168	14.4168	1.5045 NS
Error, combined	78	747.4130	9.5822	
Total, over-all	81	1156.5000		

NS - not significant at the .05 level

Estimated common regression equation:  $\hat{Y}_i = 9.04 - .61X_i$

Science, Level V

Sources of Variations	df	SS	MS	F
Regression, over-all	1	371.7308		
Difference of positions	1	60.6504	60.6504	3.1334 NS
Difference of regressions	1	1.5247	1.5247	0.0788 NS
Error, combined	91	1761.3994	19.3560	
Total, over-all	94	2195.3053		

NS - not significant at the .05 level

Estimated common regression equation:  $\hat{Y}_i = 8.69 - .48X_i$

Mathematics, Level V

Sources of Variations	df	SS	MS	F
Regression, over-all	1	663.744		
Difference of positions	1	2.5550	2.5550	0.2045 NS
Difference of regressions	1	1.0344	1.0344	0.0829 NS
Error, combined	90	1124.5389	12.4949	
Total, over-all	93	1791.8723		

NS - not significant at the .05 level

Estimated common regression equation:  $\hat{Y}_i = 10.26 - .95X_i$

Mathematics, Level VI

Sources of Variations	df	SS	MS	F
Regression, over-all	1	438.4657		
Difference of positions	1	0.1840	0.1840	0.0149 NS
Difference of regressions	1	0.6206	0.6206	0.0501 NS
Error, combined	81	1003.5532	12.3895	
Total, over-all	84	1442.8235		

NS - not significant at the .05 level

Estimated common regression equation:  $\hat{Y}_i = 10.23 - .81X_i$

Social Studies, Level IV

Sources of Variations	df	SS	MS	F
Regression, over-all	1	910.1572		
Difference of positions	1	10.5751	10.5751	1.1387 NS
Difference of regressions	1	4.3428	4.3428	0.4676 NS
Error, combined	160	1485.8700	9.2867	
Total, over-all	163	2410.9451		

NS - not significant at the .05 level

Estimated common regression equation:  $\hat{Y}_i = 7.92 - .82X_i$

Social Studies, Level V

Sources of Variations	df	SS	MS	F
Regression, over-all	1	423.9619		
Difference of positions	1	9.1494	9.1494	1.2646 NS
Difference of regressions	1	8.8456	8.8456	1.2226 NS
Error, combined	91	658.4010	7.2352	
Total, over-all	94	1100.3579		

NS - not significant at the .05 level

Estimated common regression equation:  $\hat{Y}_i = 7.49 - .88X_i$

Work Education, Level IV

Sources of Variations	df	SS	MS	F
Regression, over-all	1	743.1401		
Difference of positions	1	118.8148	118.8148	15.5107**
Difference of regressions	1	1.2625	1.2625	0.0164 NS
Error, combined	158	1210.3135	7.6602	
Total, over-all	161	2073.5309		

NS - not significant at the .05 level

\*\* - significant at the .01 level

Estimated regression equations: IMPACT:  $\hat{Y}_i = 8.62 - .76X_i$

NON-IMPACT:  $\hat{Y}_i = 7.43 - .76X_i$

Work Education, Level VI

Sources of Variations	df	SS	MS	F
Regression, over-all	1	367.5473		
Difference of positions	1	0.8324	0.8324	0.2472 NS
Difference of regressions	1	10.9500	10.9500	3.2524 NS
Error, combined	33	111.1027	3.3667	
Total, over-all	36	490.4324		

NS - not significant at the .05 level.

Estimated common regression equation:  $\hat{Y}_i = 9.49 - 1.04X_i$

Home Economics, Level V

Sources of Variations	df	SS	MS	F
Regression, over-all	1	61.1380		
Difference of positions	1	7.4477	7.4477	1.8514 NS
Difference of regressions	1	0.3935	0.3935	0.0978 NS
Error, combined	40	160.9072	4.0227	
Total, over-all	43	229.8864		

NS - not significant at the .05 level.

Estimated common regression equation:  $\hat{Y}_i = 5.02 - .49X_i$

APPENDIX G - 1

ACHIEVEMENT PROFILES OF LEVELS IV, V AND VI  
IMPACT AND NON-IMPACT PUPILS  
FOR THE THREE SITES COMBINED  
AND FOR MIGA, CEBU

(October 1977)

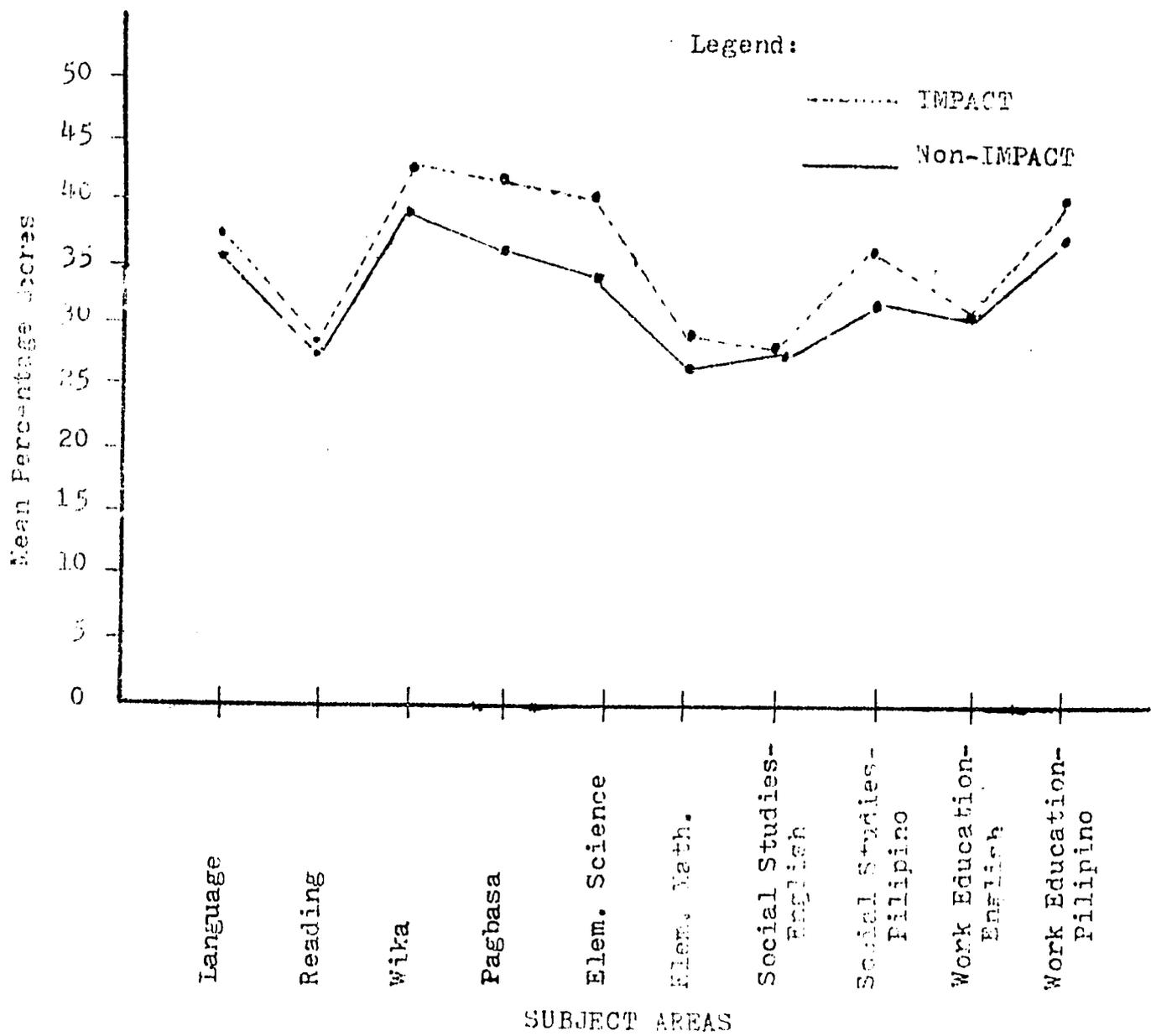


Fig. 1. Achievement Profile of Level IV Pupils in IMPACT and Non-IMPACT Schools in the Three Project Sites Combined

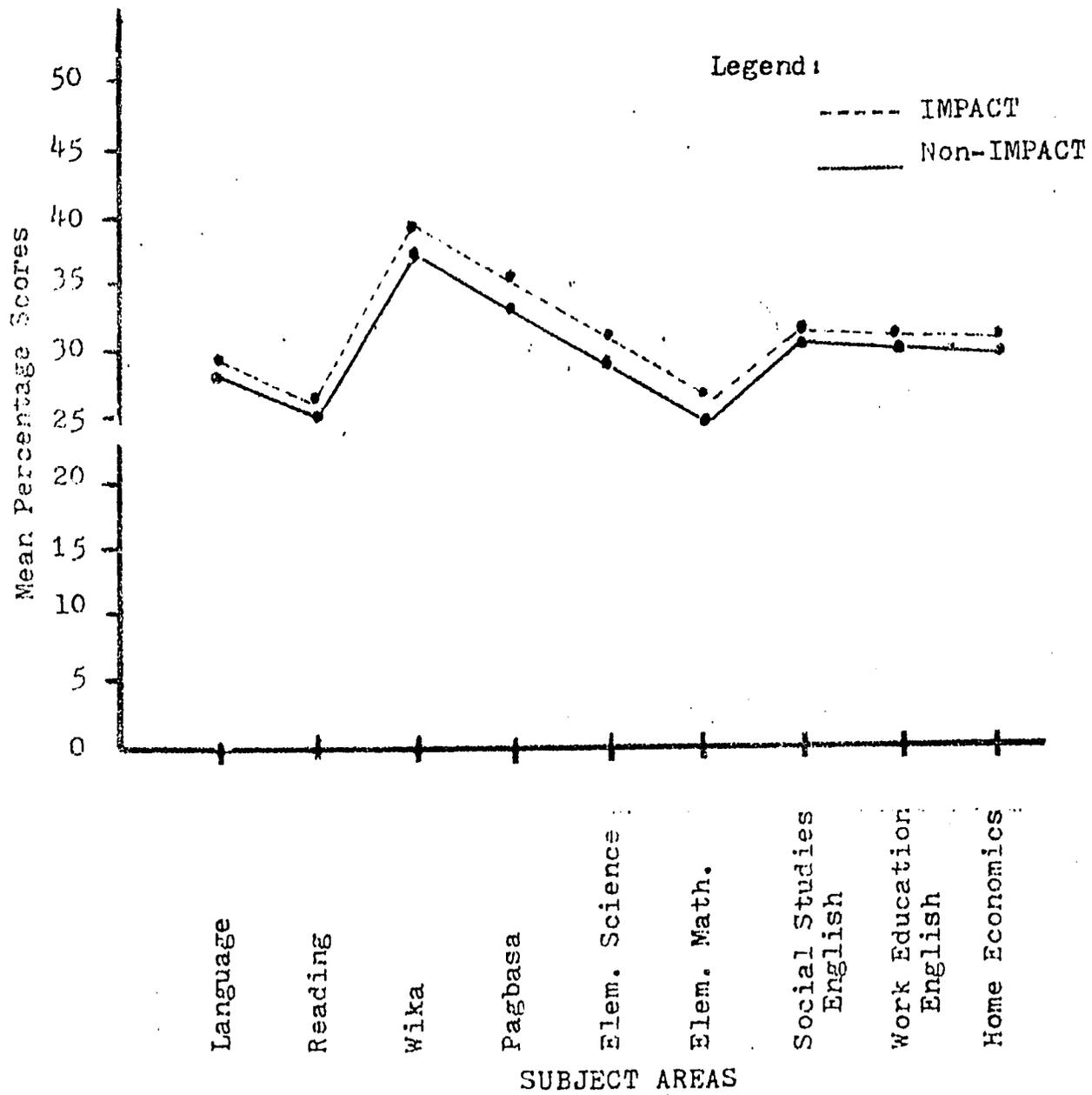


Fig. 2. Achievement Profile of Level V Pupils in IMPACT and Non-IMPACT Schools in the Three Project Sites Combined

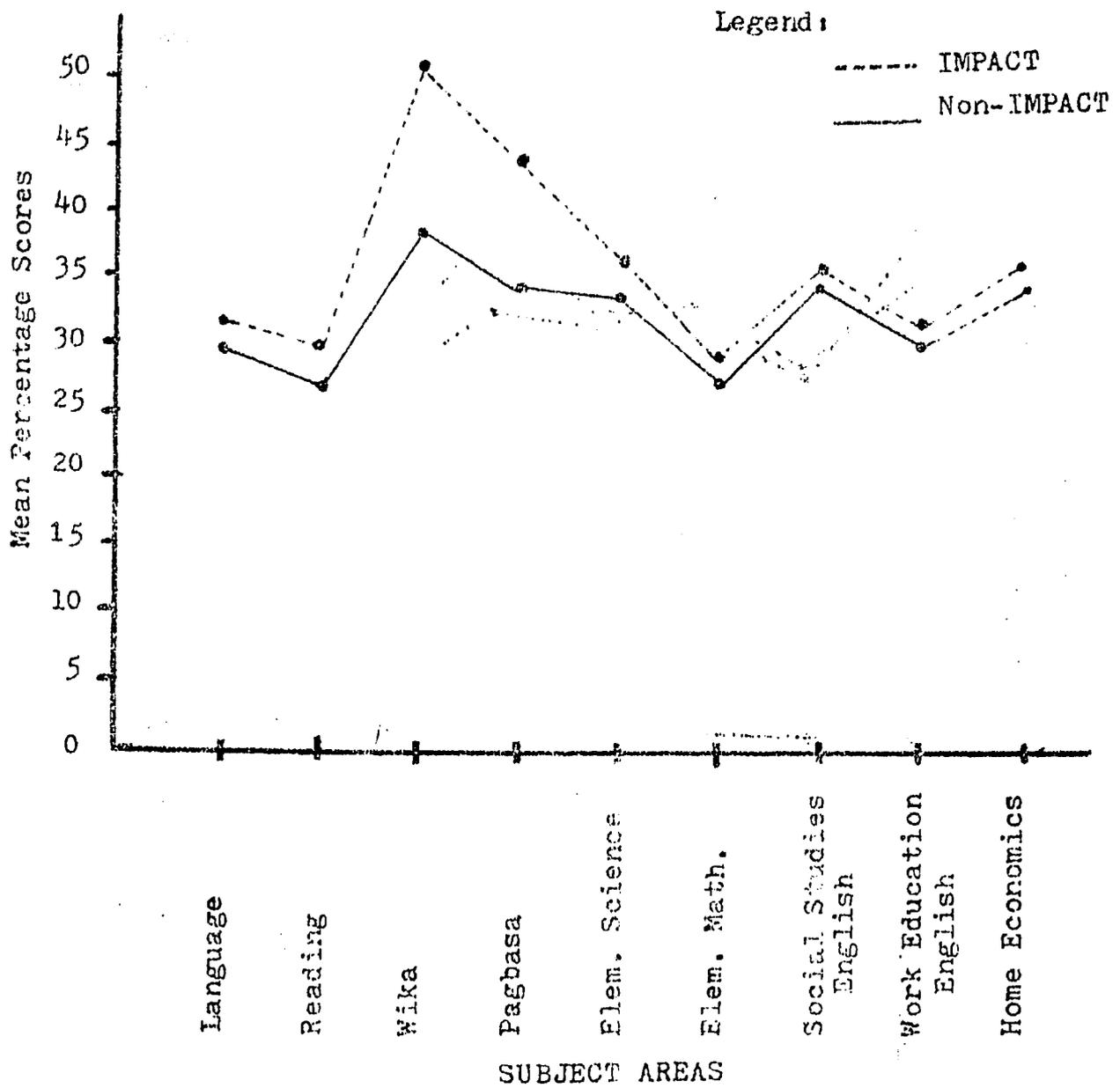


Fig. 3. Achievement Profile of Level VI Pupils in IMPACT and Non-IMPACT Schools in the Three Project Sites Combined

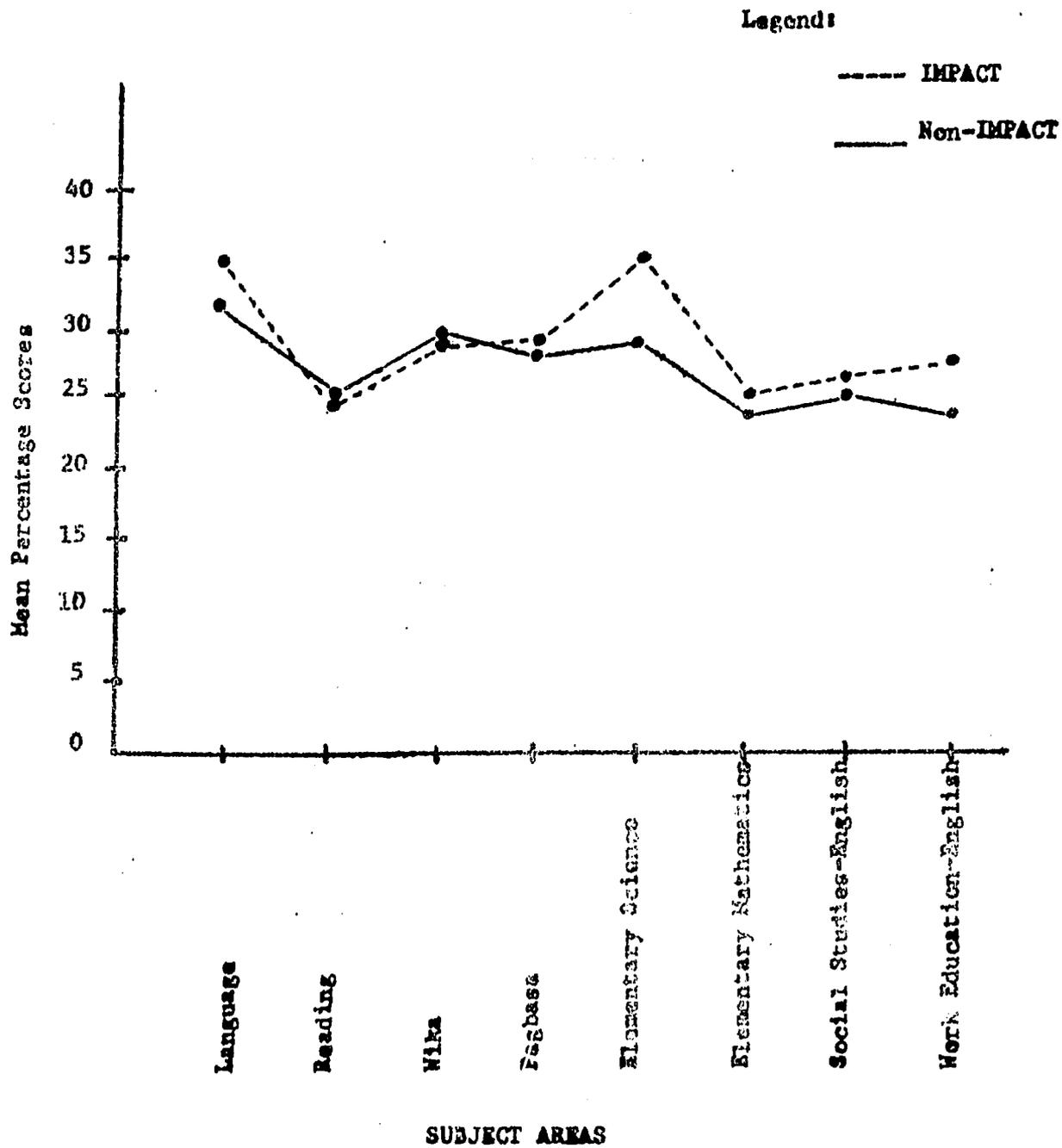


Fig. 4. Achievement Profile of Level IV Pupils in IMPACT and Non-IMPACT Schools in Naga, Cebu

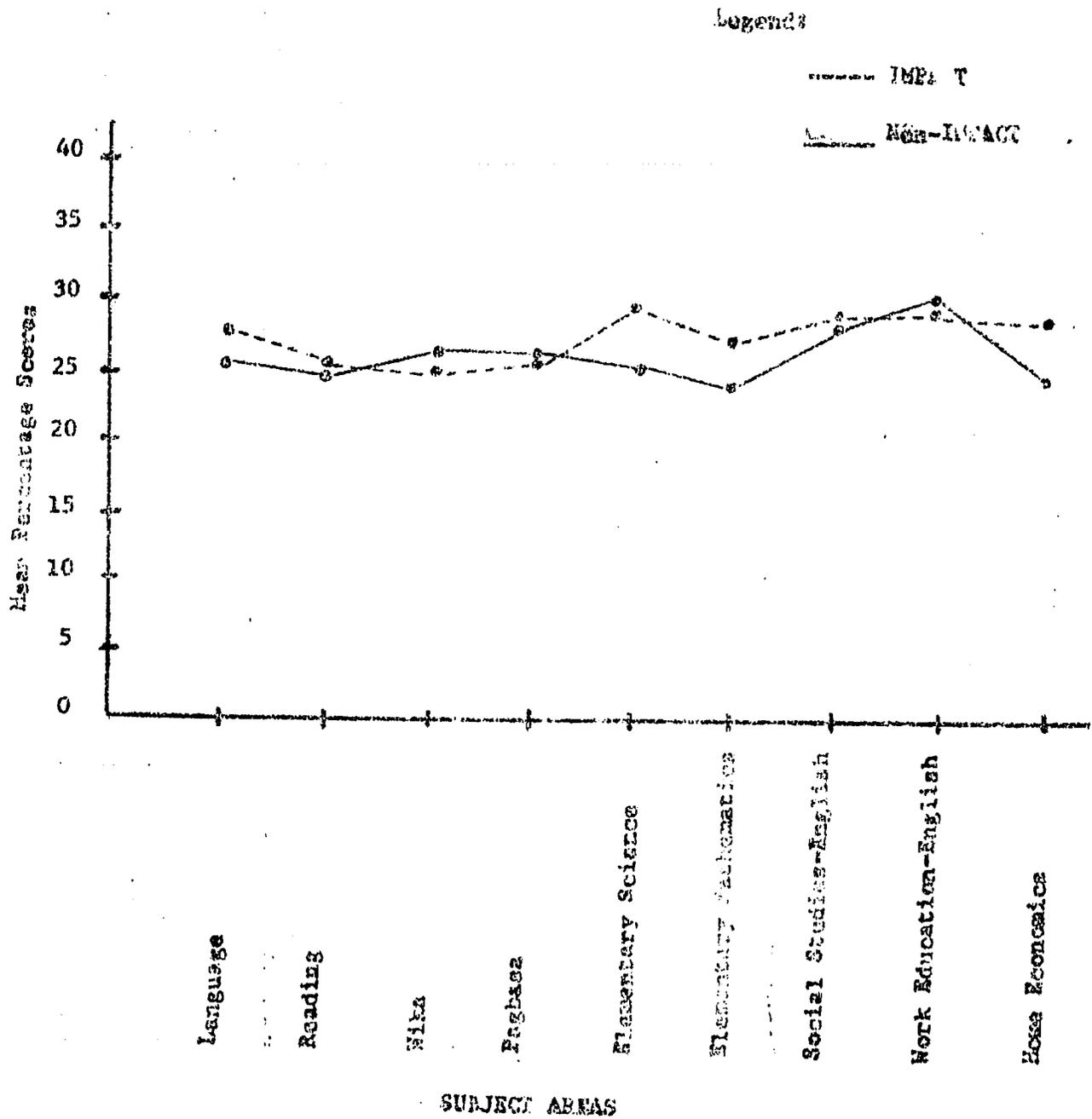


Fig. 5. Achievement Profile of Level V Pupils in IMPACT and Non-IMPACT Schools in Davao, Cebu

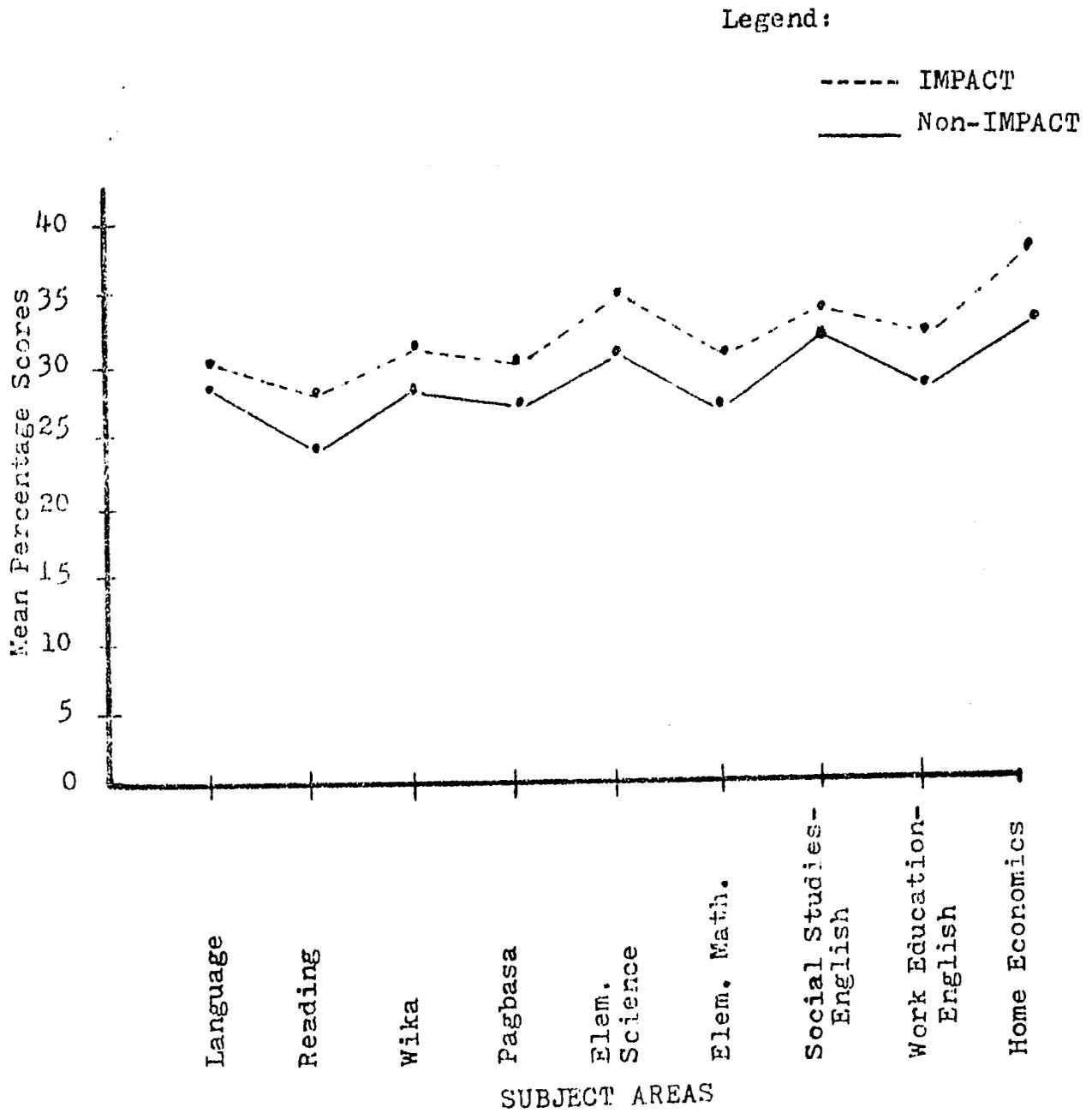


Fig. 6. Achievement Profile of Level VI Pupils in IMPACT and Non-IMPACT Schools in Naga, Cebu

APPENDIX G - 2

ACHIEVEMENT PROFILES OF LEVELS IV, V AND VI  
IMPACT AND NON-IMPACT PUPILS  
FOR THE THREE SITES COMBINED  
AND FOR NAGA, CEBU

(February-March 1978)

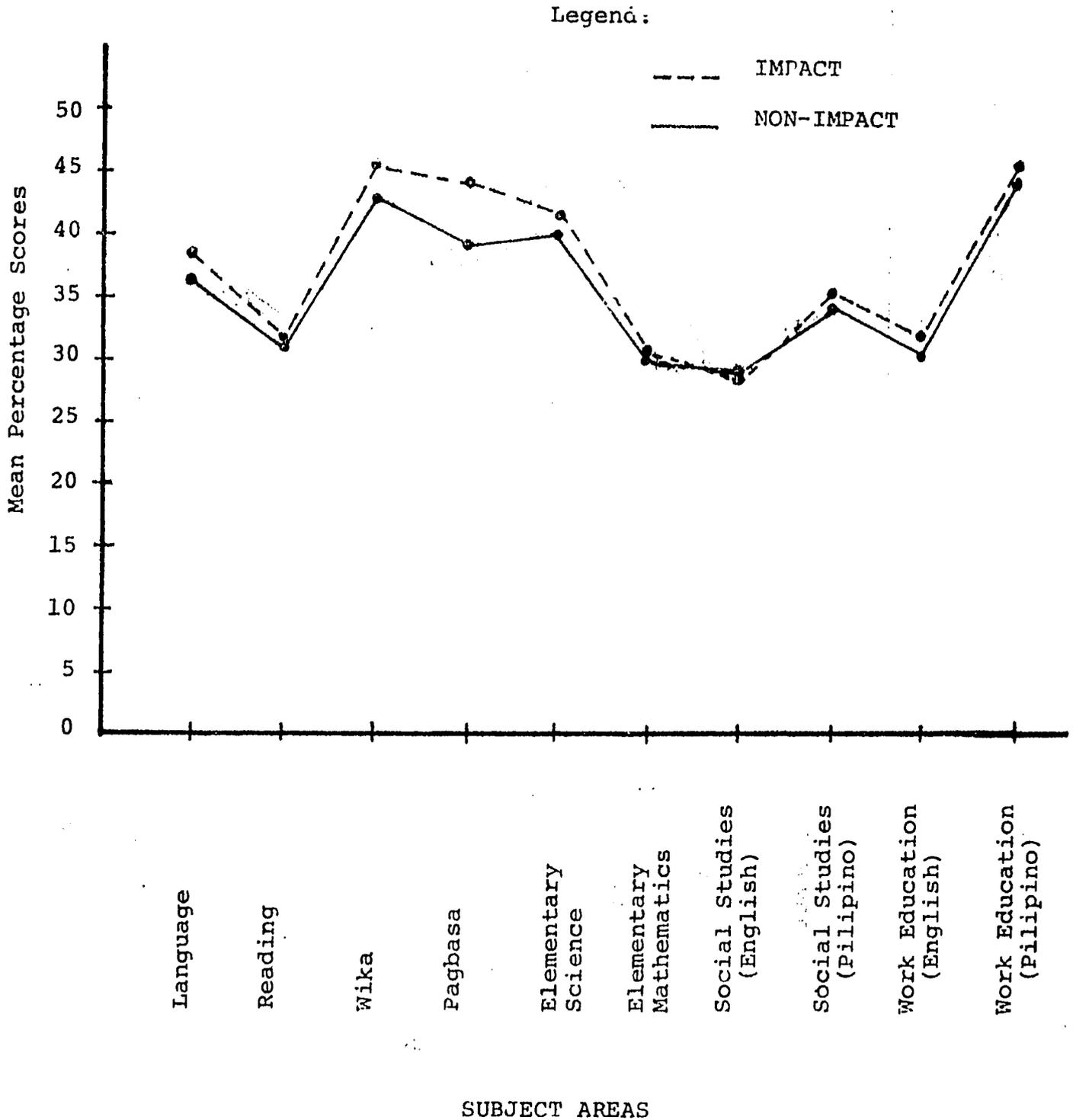


Fig. 1. Achievement Profile of Level IV IMPACT and Non-IMPACT Pupils in the February-March, 1978 Testing in the Three Sites Combined.

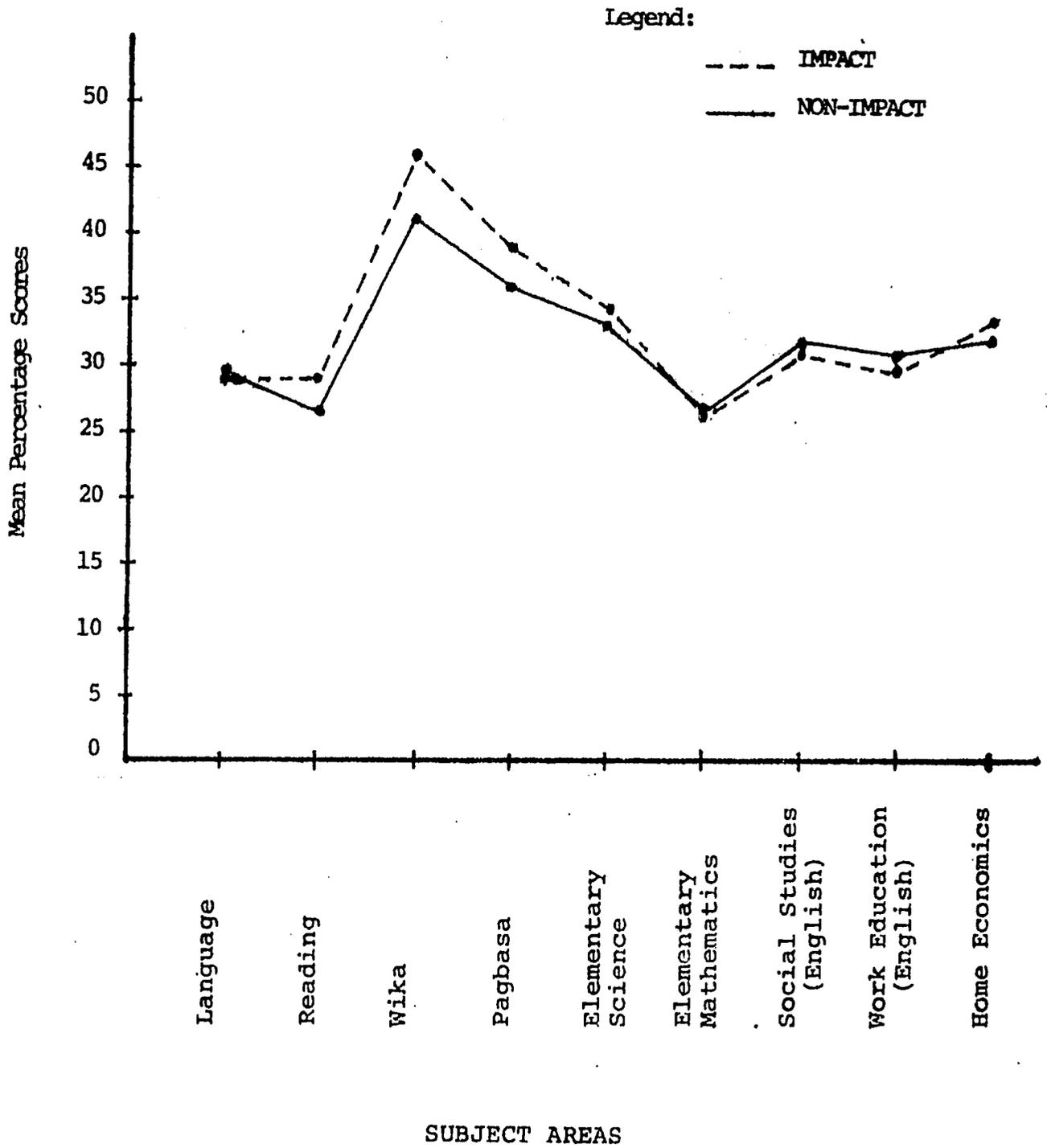


Fig. 2. Achievement Profile of Level V IMPACT and Non-IMPACT Pupils in the February-March, 1978 Testing in the Three Sites Combined

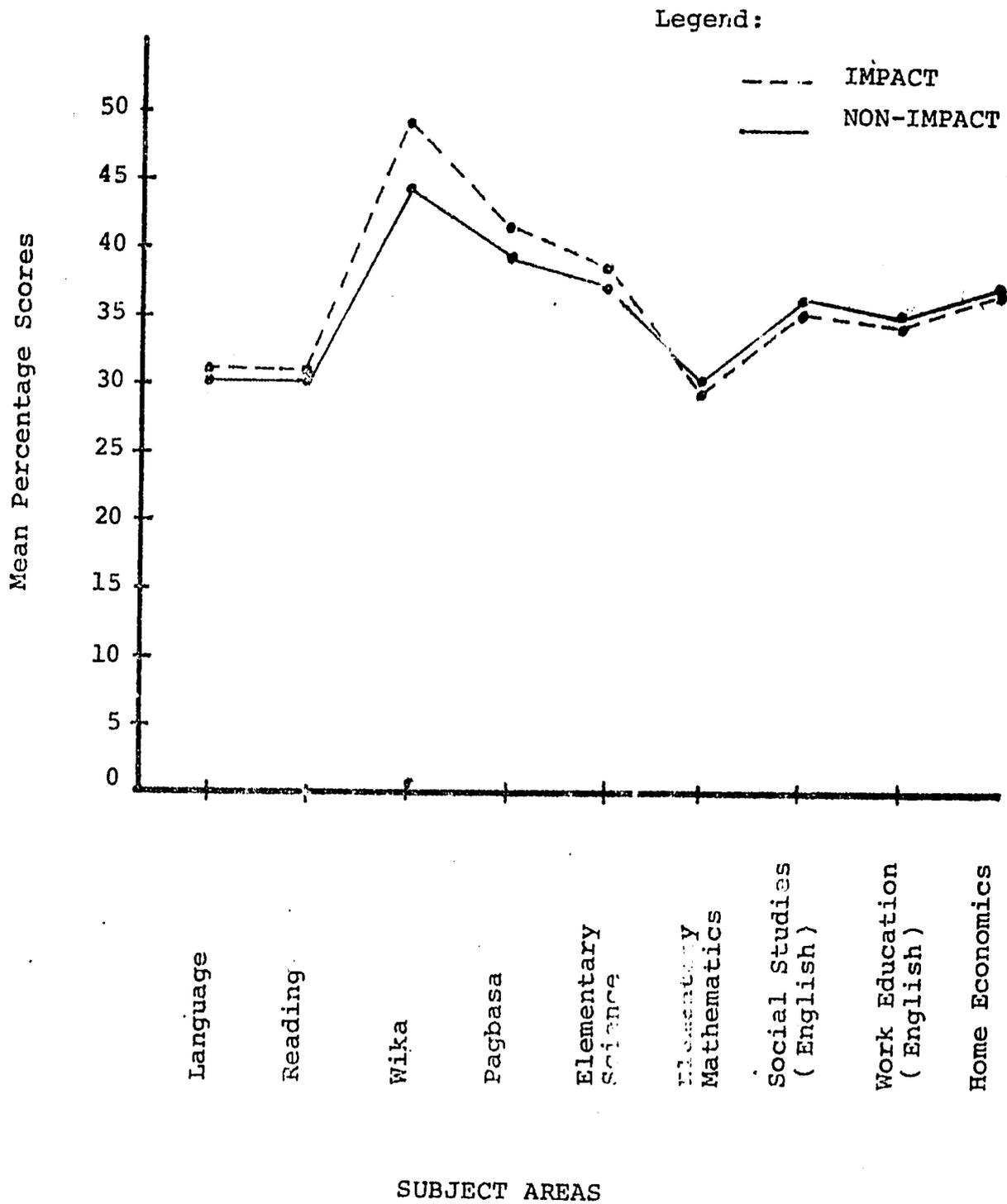


Fig. 3. Achievement Profile of Level VI IMPACT and Non-IMPACT Pupils in the February-March, 1978 Testing in the Three Sites Combined

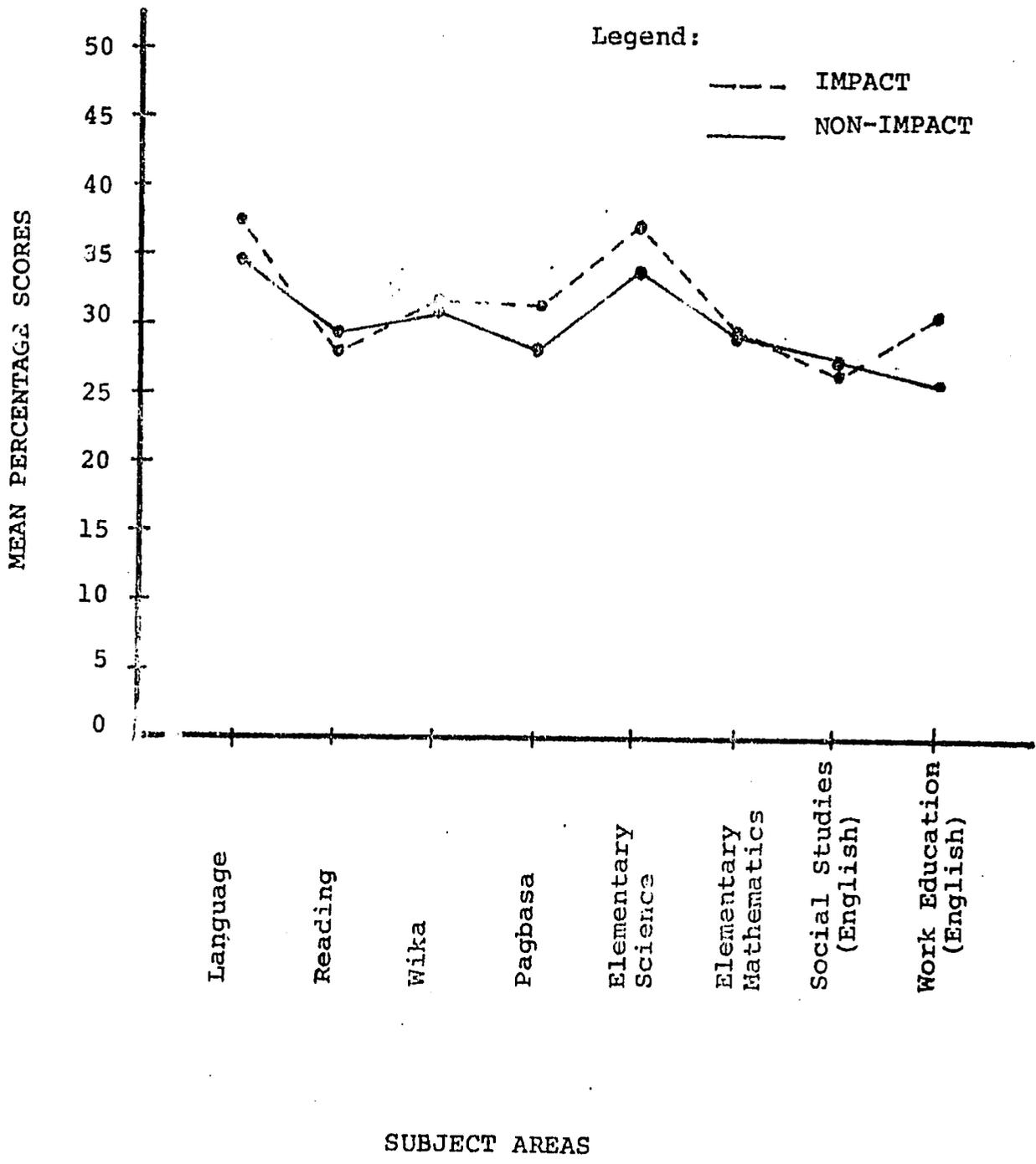


Fig. 4. Achievement Profile of Level IV IMPACT and Non-IMPACT Pupils in the February-March, 1978 Testing in Naga, Cebu

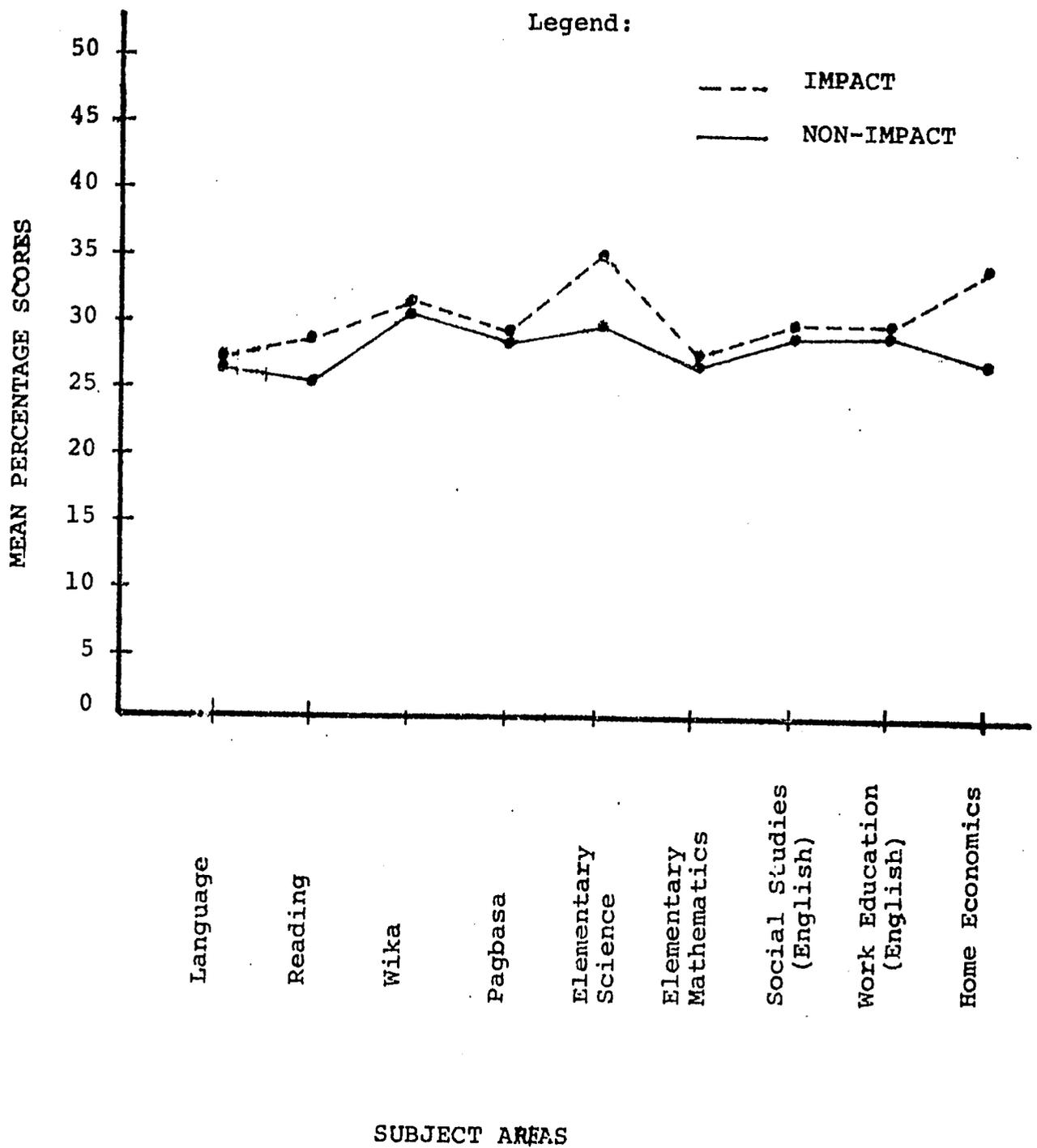


Fig. 5. Achievement Profile of Level V IMPACT and Non-IMPACT Pupils in the February-March, 1978 Testing in Naga, Cebu

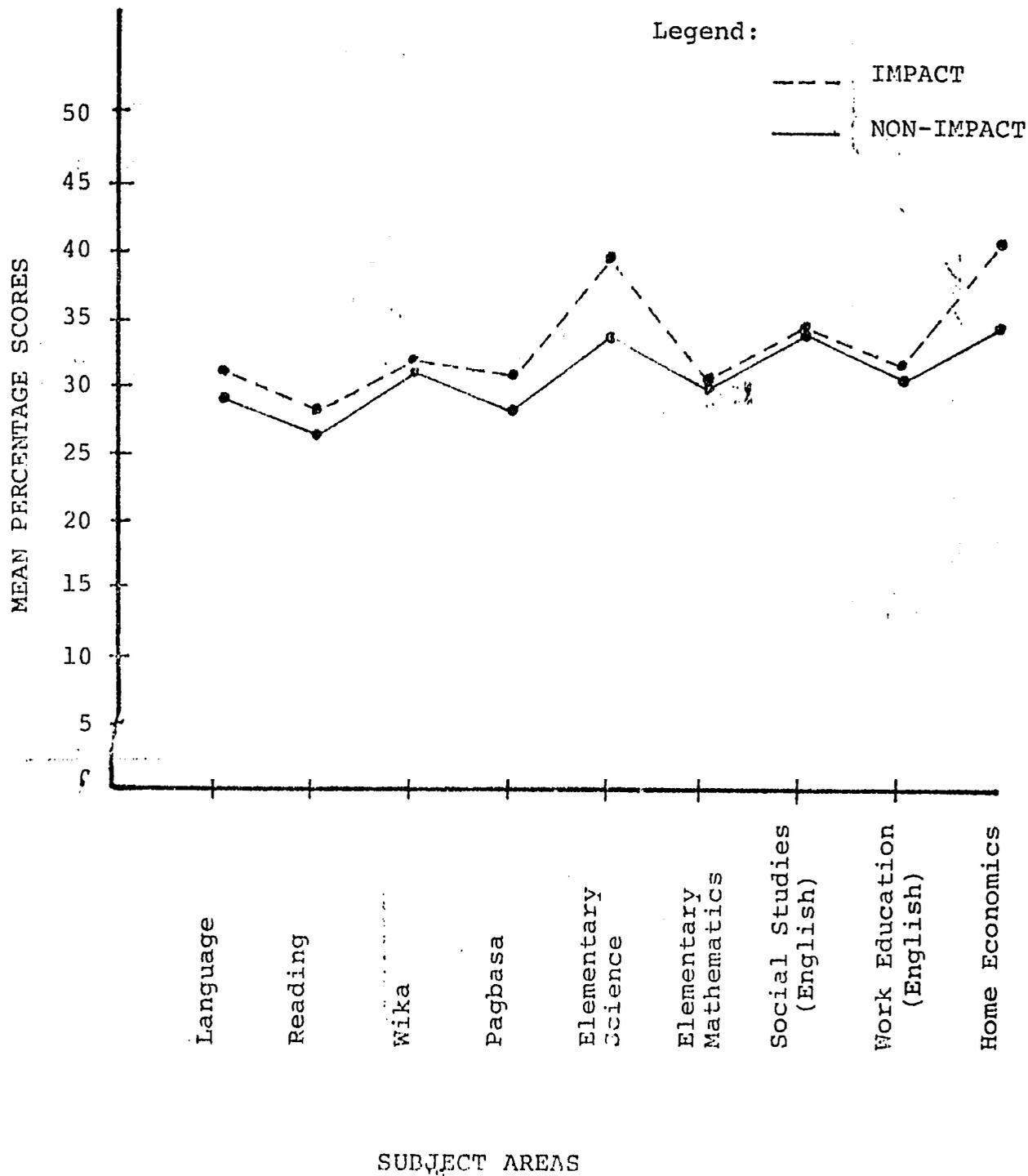


Fig. 6. Achievement Profile of Level VI IMPACT and Non-IMPACT Pupils in the February-March, 1978 Testing in Naga, Cebu

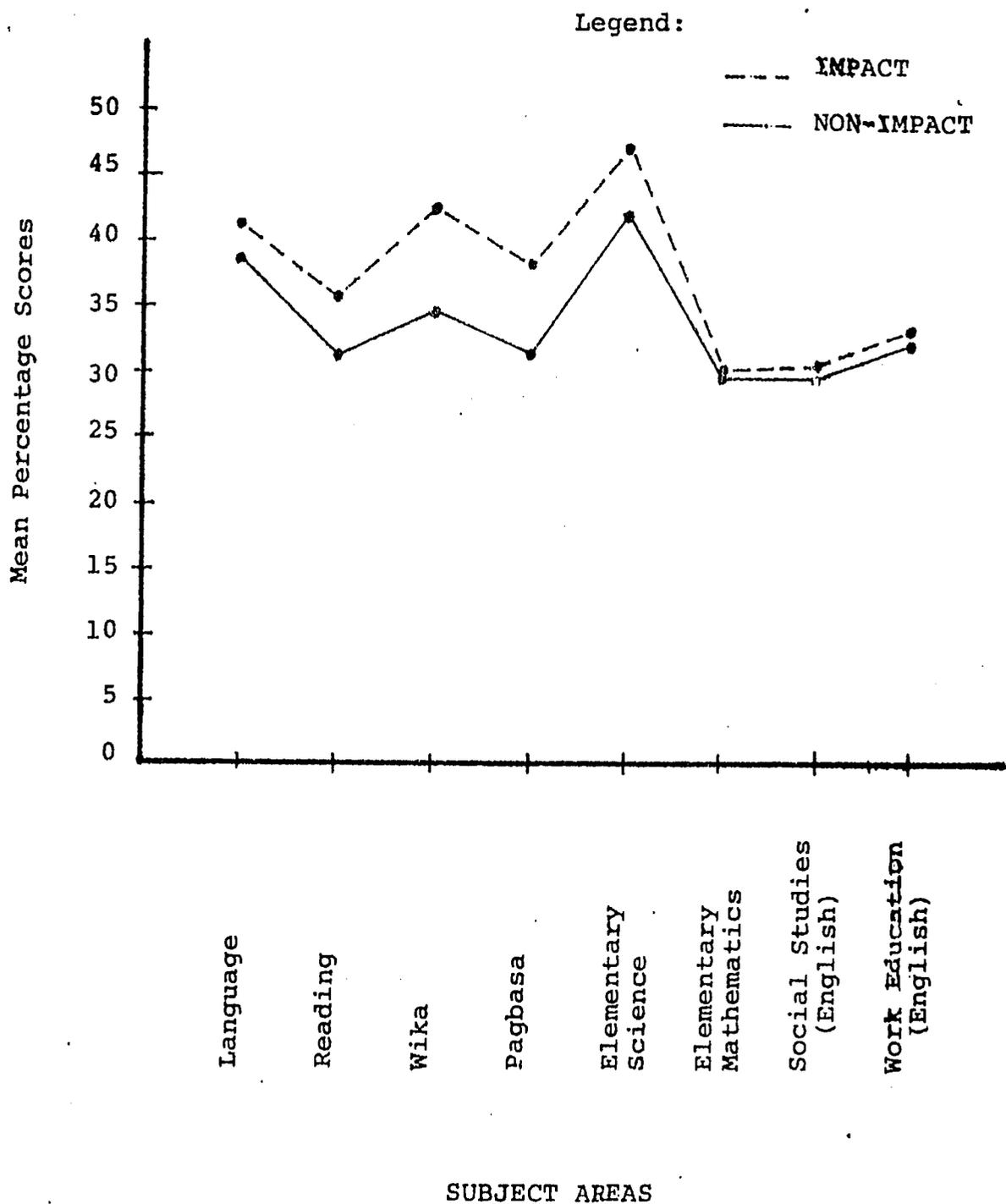


Fig. 7. Achievement Profile of Level IV IMPACT and Non-IMPACT Pupils in the February-March, 1978 Testing in Lapu-Lapu City

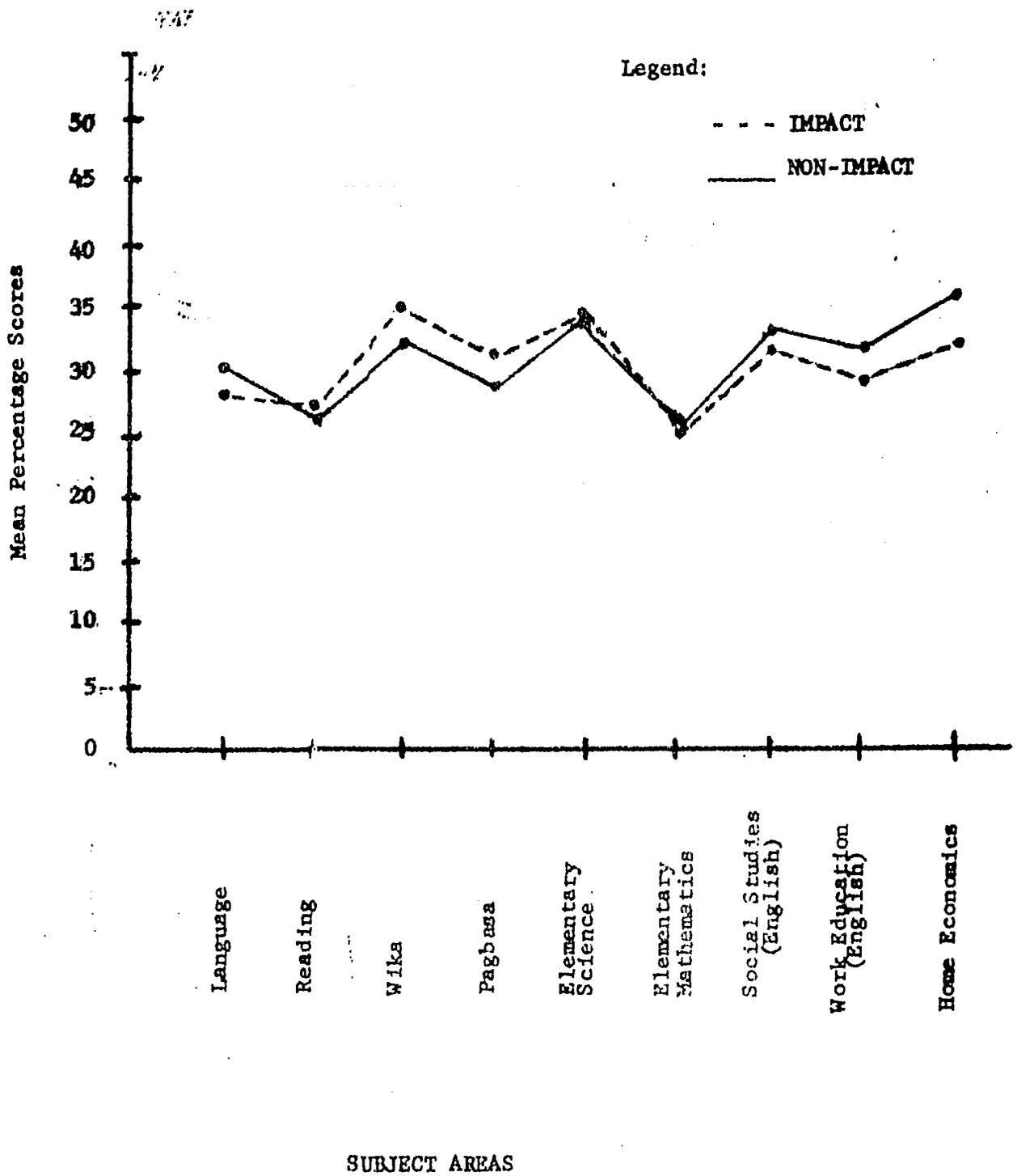


Fig. 8. Achievement profile of Level V IMPACT and Non-IMPACT Pupils in the February-March, 1978 Testing in Lapu-Lapu City

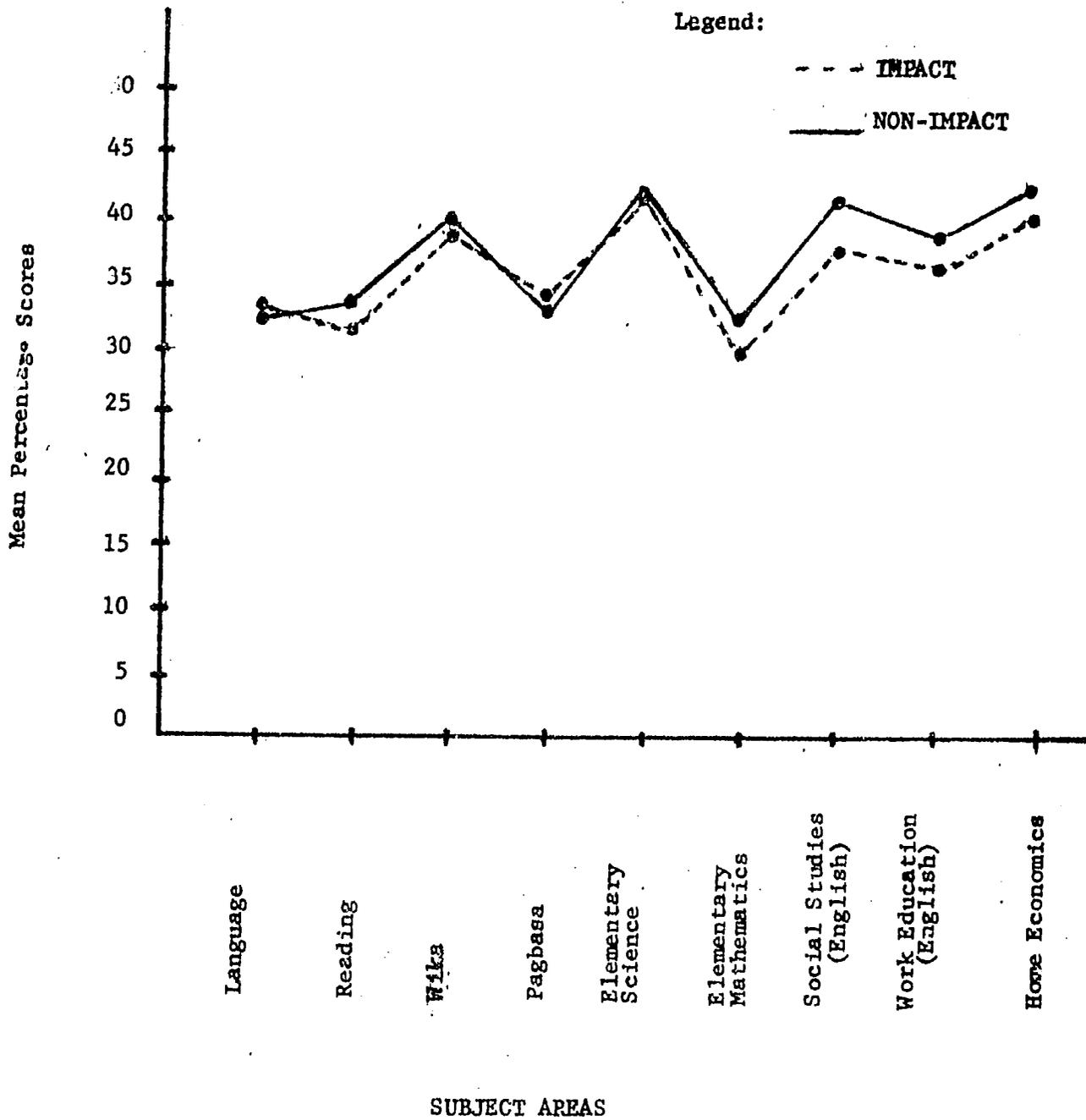


Fig. 9. Achievement Profile of Level VI IMPACT and Non-IMPACT Pupils in the February-March, 1978 Testing in Lapu-Lapu City

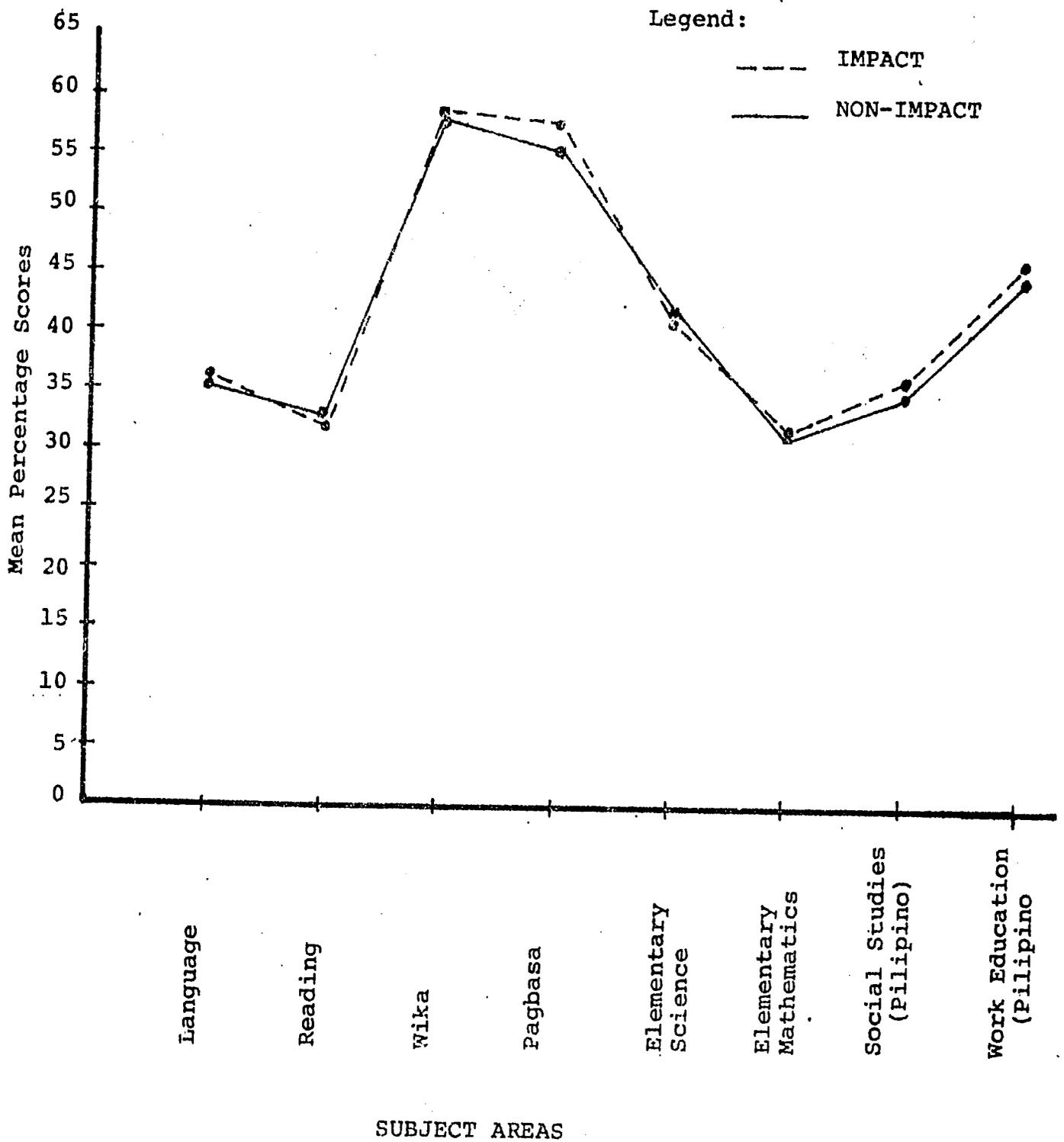


Fig. 10. Achievement Profile of Level IV IMPACT and Non-IMPACT Pupils in the February-March, 1978 Testing in Sapang Palay

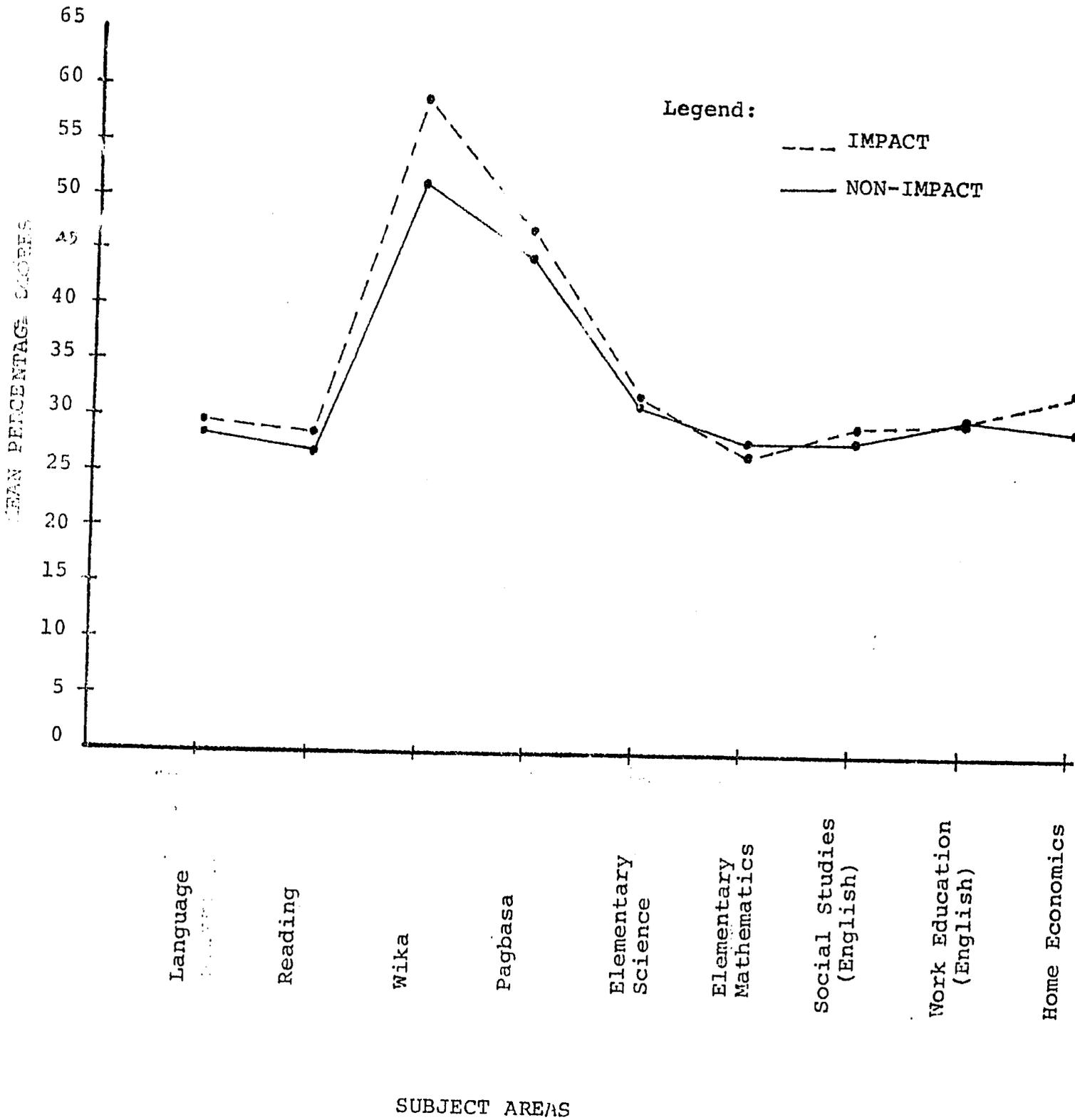


Fig. 11. Achievement Profile of Level V IMPACT and Non-IMPACT Pupils in the February-March, 1978 Testing in Sapang Palay

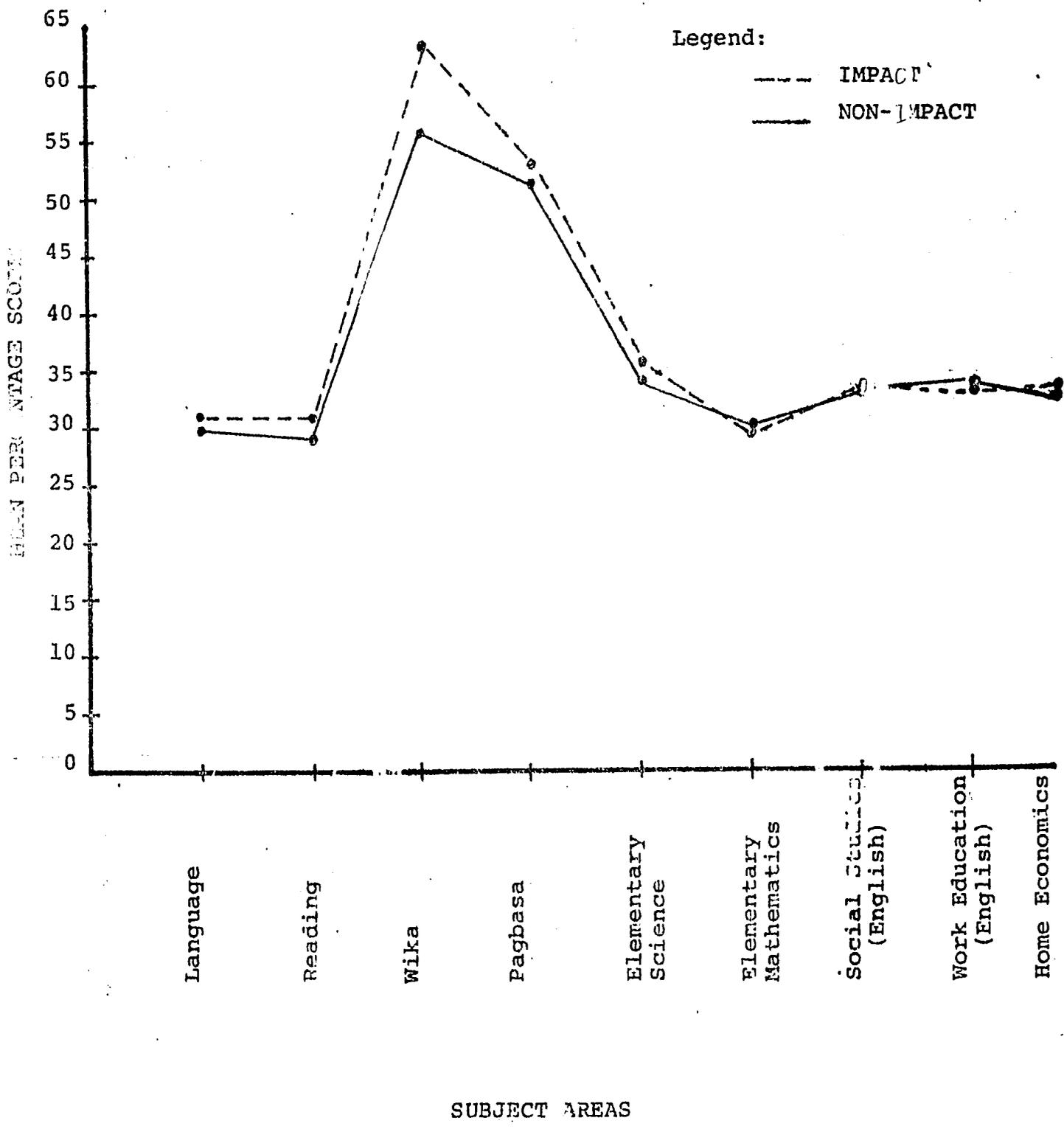
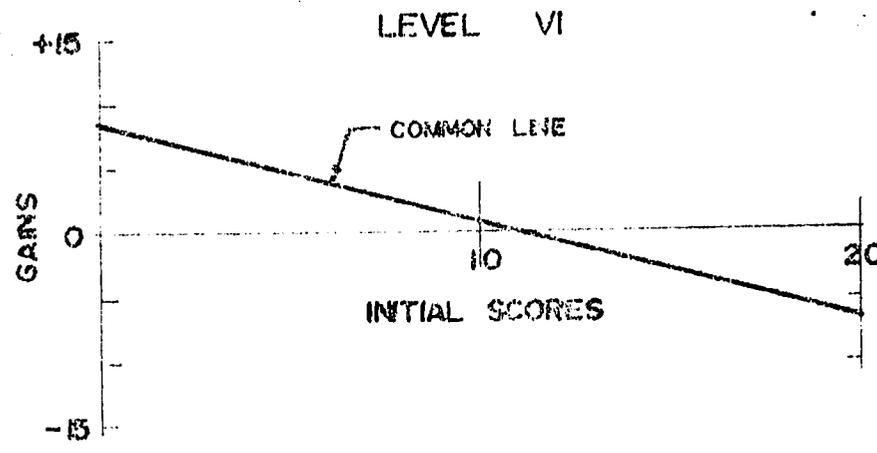
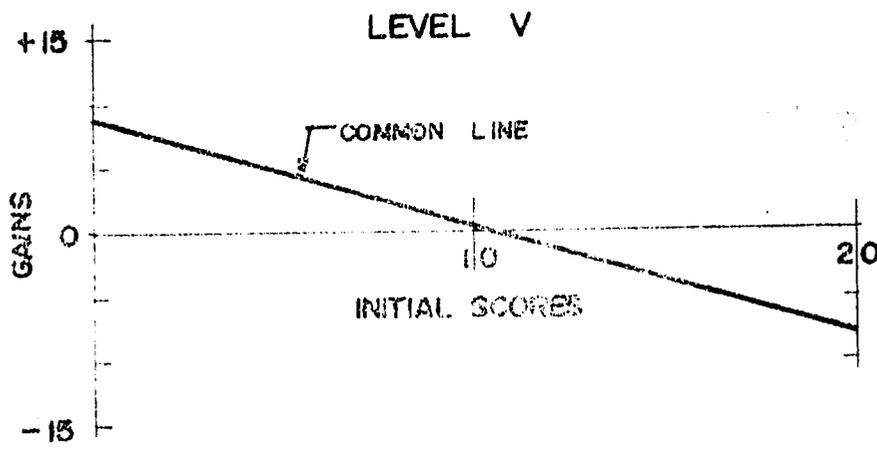
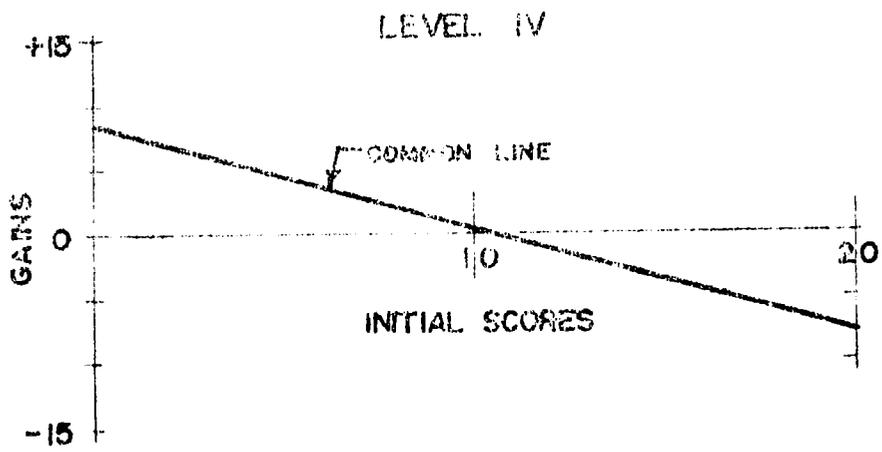


Fig. 12. Achievement Profile of Level VI IMPACT and Non-IMPACT Pupils in the February-March, 1978 Testing in Sapang Palay

APPENDIX H

LINEAR RELATIONSHIP BETWEEN GAINS AND INITIAL SCORES  
IN THE ACHIEVEMENT TESTS • NAGA, CEBU



**FIG. 13. LINEAR RELATIONSHIP BETWEEN GAINS AND INITIAL SCORES IN READING- NAGA, CEBU**

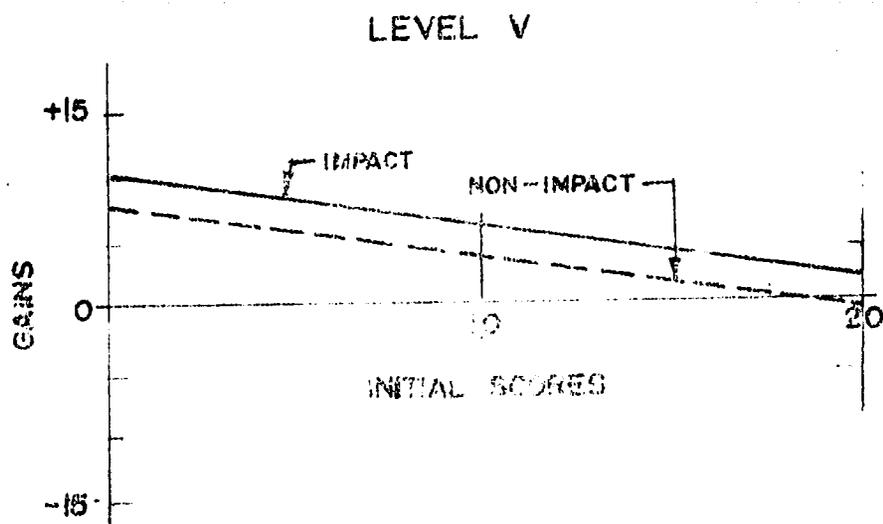


FIG. 14. LINEAR RELATIONSHIP BETWEEN GAINS AND INITIAL SCORES IN YIKA (LANGUAGE IN PILIPINO) - NAGA, CENU

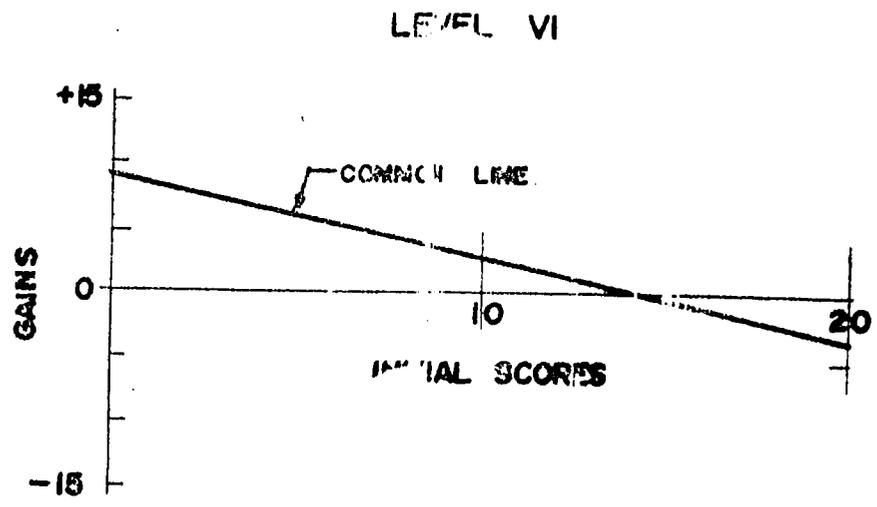
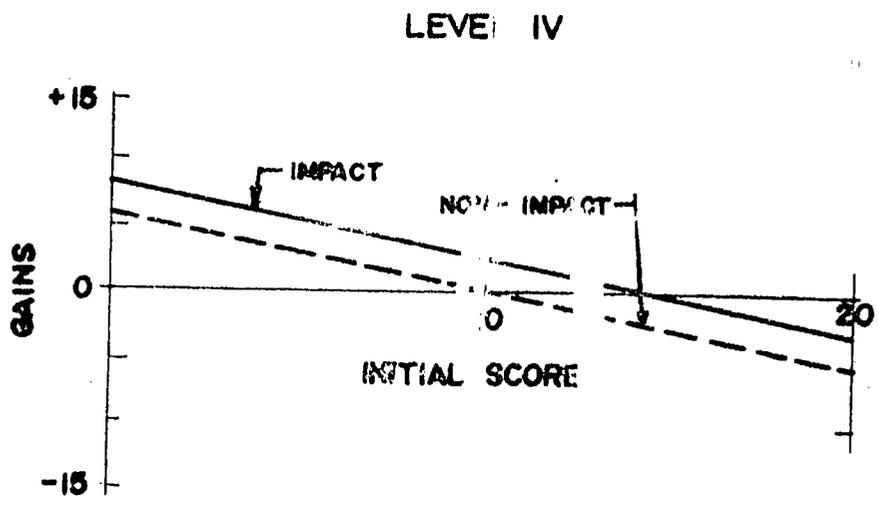


FIG. 15. LINEAR RELATIONSHIP BETWEEN GAINS AND INITIAL SCORES IN PAGBASA-NAGA, CEBU

LEVEL V

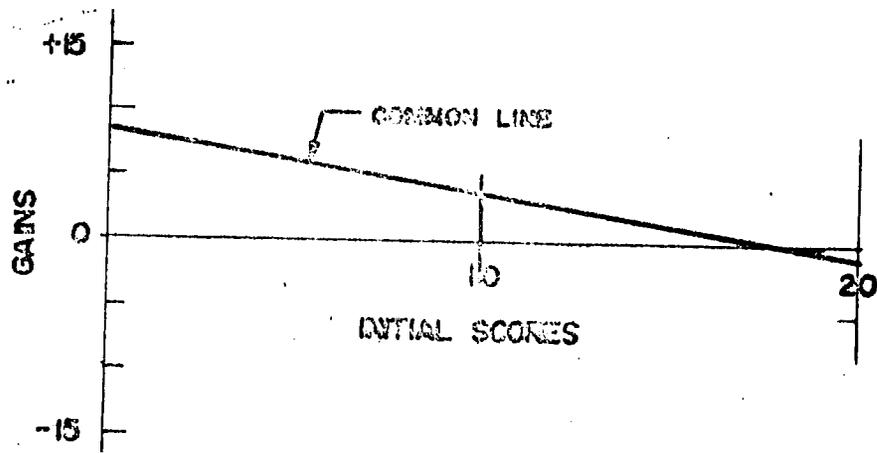


FIG. 16. LINEAR RELATIONSHIP BETWEEN GAINS AND INITIAL SCORES IN SCIENCE - NAGA, CEBU

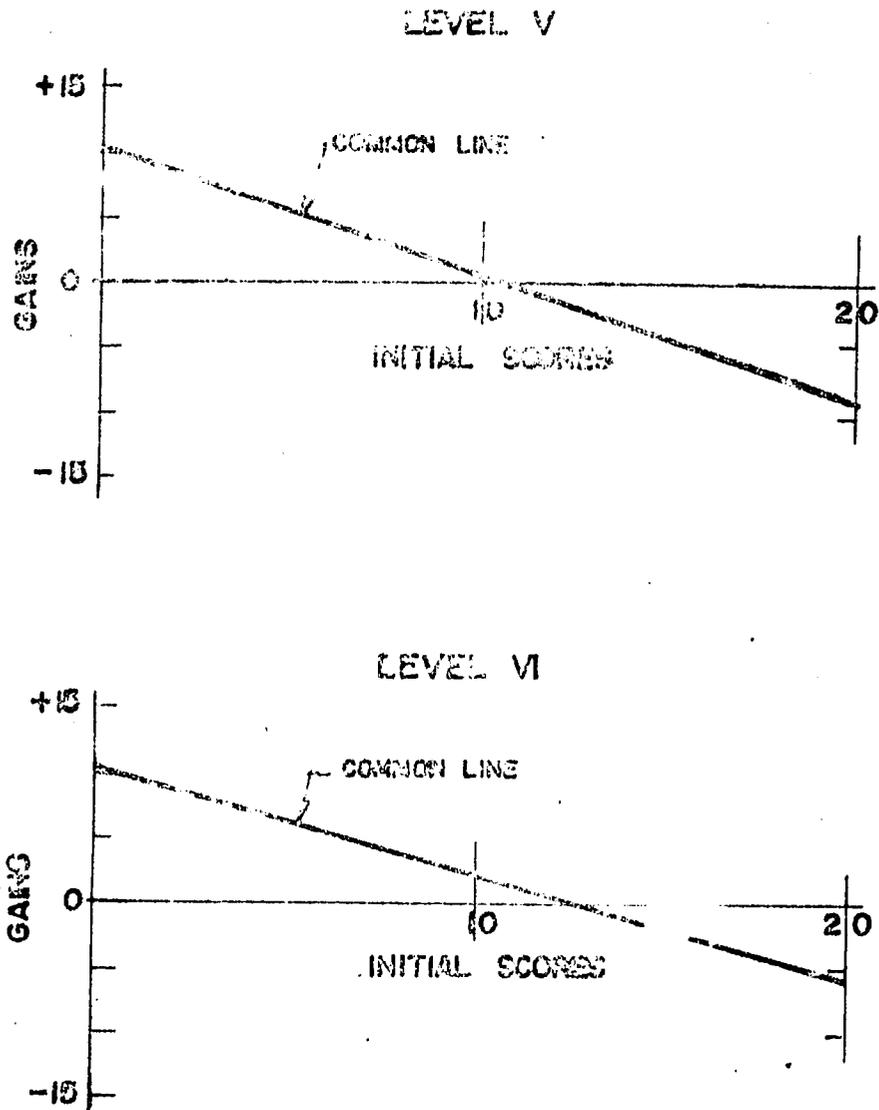
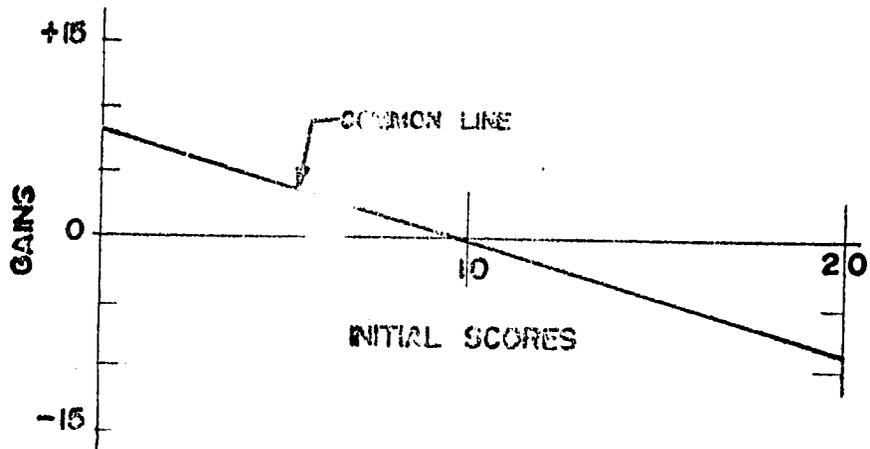


FIG. 17. LINEAR RELATIONSHIP BETWEEN GAINS AND INITIAL SCORES IN MATHEMATICS - NAGA, CEEU

LEVEL IV



LEVEL V

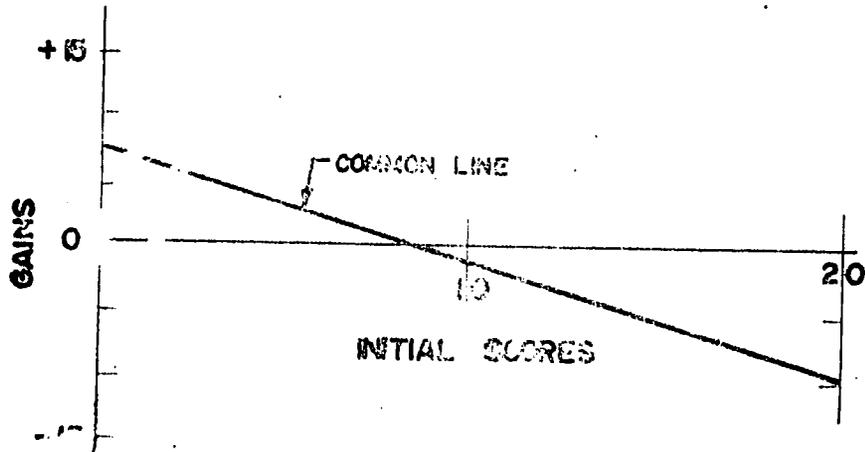
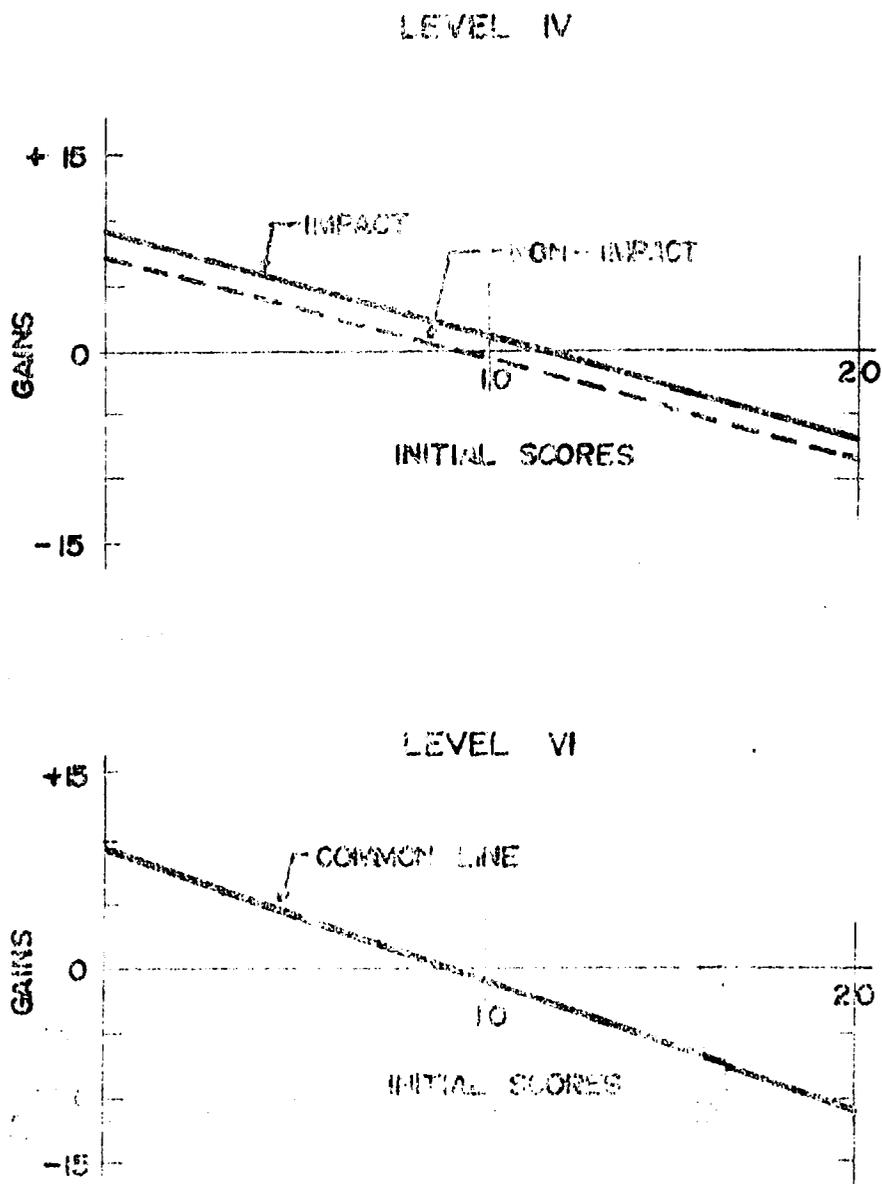


FIG. 18. LINEAR RELATIONSHIP BETWEEN GAINS AND INITIAL SCORES IN SOCIAL STUDIES- NAGA, CEBU



**FIG 19. LINEAR RELATIONSHIP BETWEEN GAINS AND INITIAL SCORES IN WORK EDUCATION - NA/A, CERU**

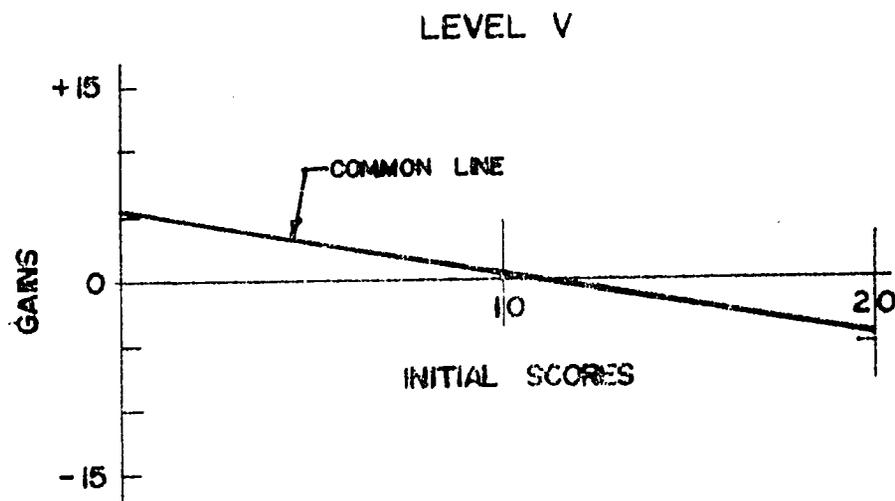


FIG. 20. LINEAR RELATIONSHIP BETWEEN GAINS AND INITIAL SCORES IN HOME ECONOMICS- NAGA, CEBU