CHAPTER FIVE

TWO MINIATURE EXPERIMENTS

"... These words certainly constitute a technical vocabulary but it is questionable whether, even when the student has mastered them, he will be able to read in his trade or qualify in trade examinations."

- G.A. Pittman

Michael West lists eight aspects of language ability. A spoken language, he says, comprises structure, vocabulary, pronunciation, intonation and behaviourism; writing and spelling, reading and symbols must be added in the case of the written and printed language. (Lee, p.96).

Of the aspects of language ability mentioned above, pronunciation, intonation and behaviourism have no direct relevance to the problem under investigation. The rest-structure, vocabulary, writing and spelling, reading and symbols - are the aspects which are directly linked with it.

To study all these aspects, though they are directly linked with the problem, is unwieldy or, at least, impracticable in view of the limitations within which the investigation has to be completed. The scope
of the investigation, therefore, has been narrowed down chiefly to vocabulary as far as the related aspects of language ability are concerned.

The investigator initiated and proceeded with the assumption that the following two ideas were quite practicable with reference to vocabulary teaching:

(i) that the knowledge of the broad meaning of a lexical item helps the learner comprehend the technical terms made up wholly or partly of that item; and

(ii) that it is possible for the teacher of English to teach a special vocabulary efficiently enough to equip students with the power to comprehend written material on their subject.

The assumption was supported by questionnaire respondents and interviewees. However, two small experiments were conducted - only to further strengthen his assumption. In view of a very limited objective they were set to achieve, the experiments were conducted on a small scale.

The procedure followed in conducting the two miniature experiments - one on a group of commerce
students and the other on that of science students is described below in its broad outline:

(i) Two lists of lexical items having a technical connotation were prepared, one each for the two faculties. The students were unfamiliar with these items.

(ii) The general meaning of each of these lexical items was taught to the students.

(iii) After teaching the lexical items, the students' power of recognizing the technical terms made up of them was tested.

Complete details concerning the experiments are as follows:

**EXPERIMENT ONE : COMMERCE**

Experiment One was tried out on a group of 33 Pre-University Commerce students of H.L. College of Commerce, Ahmedabad, who offered Gujarati as the medium of learning. The group was not made up of students specially selected on any basis. It was one of the three groups of a Pre-University Commerce class at the college. The division of the class into three groups
was not based on individual merits; it was purely a quantitative division of the students mentioned on roll in alphabetical order. The sample was, thus, purely accidental and unbiased.

Stage One:

Some vocabulary items which are in common use form part of terms having a technical connotation in Commerce. In consultation with the teachers of subjects other than languages at Pre-University Commerce (i.e. Accountancy, Business Mathematics, Commerce, Commercial Geography and Economics), a list of terms capable of yielding about 100 words teachable in their general context, without any reference to the technical sense they carry, was made. The terms were selected from the topics already learnt by the students. The connotation of the terms was exactly understood by the investigator from the subject-teachers.

The terms were divided up into words and these, approximately 100, words were further processed in order to eliminate those likely to be known to the group. The elimination was guided by the School Vocabulary (Appendix F) and the investigator's experience of teaching English to Pre-University Commerce classes.
55 words (Appendix C-1) which Pre-University Commerce students were likely to be unfamiliar with were thus finally retained.

The group was given the list of these 55 words with the relative grammatical category (verb, adjective etc.) mentioned in an abbreviated form against each word. The words, alphabetically arranged and serially numbered, were divided into six parts - all but the last one containing 10 words each. The idea was: presented in small divisions, words could be less unwelcome to learners. The students were asked to write, in the space provided, as many meanings of each item on the list as they knew. This helped the further eliminate words known to the students.

The final selection was of 14 words, 8 of which were known to none of the 33 students, 3 were known to only 2 students and 3 more were respectively known to one, three and five. The words are given below:

1. Complementary (a)  8. Diminish (v)
2. Composite (a)      9. Return (n)
3. Defer (v)          10. Formation (n)
4. Durable (a)        11. Kind (n)
5. Approval (n)       12. Perish (v)
6. Visible (a)        13. Sole (n)
7. Several (a)        14. Windfall (n)
From the list of the technical terms collected earlier, terms in which the above words occurred were selected. It was seen that the rest of the words forming part of these terms be simple enough to be taken as known to the group. The following is the list of these terms:

1. Complementary Demand  
2. Composite Demand  
3. Deferred Payment =  
4. Durable Goods  
5. Goods on Approval  
6. Invisible Goods  
7. Joint and Several  
8. Law of Diminishing Returns  
9. Law of Formation  
10. Payment in Kind  
11. Perishable Goods  
12. Sole Rights  
13. Windfall profits

There are 13 terms to cover the 14 words listed earlier. Term No. 8 contains two such words while the rest contain one each. As mentioned earlier, the group had already learnt in their mother tongue the concepts covered by these terms.

Stage Two:

At the second stage of the experiment, the investigator met the same group of 33 students again for a two-fold purpose: to teach them the 14 words
in their general sense and to study the impact of this teaching on their power of recognizing the terms which were made up of these words besides those already known to them.

In addition to the 14, two more words were taught to the students. The two additional words were meant to cover a term used as a distractor in the test described in the following paragraphs. Only the general sense of each word was taught, in the students' mother tongue, not its peculiar connotation as reflected in the corresponding technical term. "Defer (v)", for example, was explained as "Postpone (v)" and "Perish (v)" as "Be destroyed". Illustrations given during the teaching bore relevance to general contexts, not to special ones in which they are used in the world of commerce. "The cabinet deferred its decision on the subject" illustrated "Defer" while "The enemy will perish if there is war" illustrated "Perish". To plug imperfections, if any, in teaching, a glossary of the 16 words (Appendix C-2) was given to the students. The glossary contained no illustration.

The impact of this vocabulary teaching on the students' power of recognizing the corresponding technical terms was measured with a group-matching test (Appendices C-3, C-4)
immediately after the teaching was over. Group A listed 14 technical terms in which the words just taught occurred. Group B contained possible illustrations, in Gujarati, for the concepts suggested by the terms. The students were asked to match the items, which were not rendered in a matching order. That is, they were asked to write in the square provided against each term in Group A the number of the suitable illustration given in Group B. Item No. 6 in Group A, for example, is "Goods on Approval" and the matching item in Group B is No. 5, which reads "You dispatch certain goods to your customer and ask him to send payment if he likes them, otherwise to return them. What is the kind of such goods?" The students were expected to write "5" in the square provided against "Goods on Approval" in Group A. Incidentally, the Gujarati equivalent of the term has no direct relation to the word "Approval".

The changes of group-matching being guided by guesswork were minimized, if not eliminated, by way of presenting items which could work as distractors. It could be reasonably believed that the students knew to which Gujarati word the English word "Goods" was equivalent. Had there been only one item on either side referring to "Goods", simple guesswork could, obviously,
succeed. But there are four terms with "Goods" as the principal word, and, therefore, a simple matching between "Goods" in Group A with the illustration describing some "goods" in Group B was not possible. Similarly, there are two terms with "Payment" as the principal word, two with "Demand", two with "Profit", two with "Rights" and two more with "Law". It was with a view to introducing a distractor to "Windfall Profit" that "Earned Profit" was included in Group A.

For the reasons stated below, the students were allowed to retain the glossary provided to them and to look it up if and when necessary during the test:

(i) Learning does not take place at the first instance of teaching an item. This is true especially of vocabulary teaching. Perfect vocabulary teaching requires a contextualized introduction of lexical items, and drilling for consolidation. Any deviation from this course might help the natural process of forgetting the items learnt. As a safeguard against a possible working of the process of forgetting, it was necessary to keep the glossary available to the students for reference.
(ii) The explanation of each word was that of its broad meaning and did not give away the technical meaning relevant to the concept suggested by the term. Hence there was no possibility of a mechanical application of the meaning of a word to the term containing the same word, and thus a student being helped to have the groups matched.

Results:

The performance of the group at the two stages of Experiment One is presented in Table 5.1. A discussion on the results of the experiment follow the table.
### Table 5.1: The Impact of the Teaching of Broad Meanings of Special Vocabulary Items on Students' Power of Recognizing Corresponding Technical Terms in Commerce

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Vocabulary Item</th>
<th>Percentage of Students' Familiarity with the Item</th>
<th>Corresponding Technical Term</th>
<th>Percentage of Students Who Recognized the Term</th>
<th>Gain (in percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Complementary (adj)</td>
<td>0</td>
<td>Complementary Demand</td>
<td>94</td>
<td>94</td>
</tr>
<tr>
<td>2</td>
<td>Composite (adj)</td>
<td>0</td>
<td>Composite Demand</td>
<td>82</td>
<td>82</td>
</tr>
<tr>
<td>3</td>
<td>Defer (v)</td>
<td>0</td>
<td>Deferred Payment</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>4</td>
<td>Durable (adj)</td>
<td>0</td>
<td>Durable Goods</td>
<td>91</td>
<td>91</td>
</tr>
<tr>
<td>5</td>
<td>Approval (n)</td>
<td>0</td>
<td>Goods on Approval</td>
<td>73</td>
<td>73</td>
</tr>
<tr>
<td>6</td>
<td>Visible (adj)</td>
<td>15</td>
<td>Invisible Goods</td>
<td>82</td>
<td>79</td>
</tr>
<tr>
<td>7</td>
<td>Several (adj)</td>
<td>6</td>
<td>Joint &amp; Several Rights</td>
<td>88</td>
<td>89</td>
</tr>
<tr>
<td>8</td>
<td>Diminish (v)</td>
<td>9</td>
<td>Law of Diminishing Returns</td>
<td>91</td>
<td>90</td>
</tr>
<tr>
<td>9</td>
<td>Returns (n)</td>
<td>3</td>
<td>Law of Diminishing Returns</td>
<td>91</td>
<td>91</td>
</tr>
<tr>
<td>10</td>
<td>Formation (n)</td>
<td>6</td>
<td>Law of Formation</td>
<td>91</td>
<td>94</td>
</tr>
<tr>
<td>11</td>
<td>Kind (n)</td>
<td>0</td>
<td>Payment in Kind</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>12</td>
<td>Perish (v)</td>
<td>0</td>
<td>Perishable Goods</td>
<td>94</td>
<td>94</td>
</tr>
<tr>
<td>13</td>
<td>Sole (n)</td>
<td>6</td>
<td>Sole Rights</td>
<td>73</td>
<td>71</td>
</tr>
<tr>
<td>14</td>
<td>Windfall (n)</td>
<td>0</td>
<td>Windfall Profits</td>
<td>97</td>
<td>97</td>
</tr>
</tbody>
</table>
The teaching of the broad meanings of the 14 vocabulary items has a distinct, favourable bearing on the students' recognition of the corresponding technical terms. In eight cases, the gain is between 91% and 100%. It is 81% to 90% in three cases and 71% to 80% in three more cases.

Eleven terms have been recognized by over 80% of the students. This is quite satisfactory by any standard. Three terms have been recognized by students between 71% and 80%. In view of a phenomenal success of the same students in recognizing other terms, their failure to recognize these three needs explanation. In two cases, the corresponding Gujarati terms are so worded that they do not, apparently, suggest any relationship with their English counterparts; students could see such correspondence between the terms only with the use of inference. In the third case, the corresponding Gujarati term used is a rather learned word and hence, perhaps, some students failed to see correspondence between the two terms in the two languages on the basis of the general meanings of its words known by them.

The percentage of those who failed to recognize the rest of the terms is insignificant. It can be ascribed to the wavering attention and the inadequate
grasping power of some individuals as also, perhaps, to the shortcomings that might have crept into the method of teaching the items.

**EXPERIMENT TWO : SCIENCE**

This experiment was tried out on a group of 24 Pre-University Science students of M.G. Science Institute, Ahmedabad, who offered Gujarati as the medium of learning. The group, like the one for Experiment One, was not specially selected on any special basis. It was one of the three groups of a Pre-University Science class at the college. The division of the class was not based on individual merits. It was purely a quantitative division of the students mentioned on roll in alphabetical order. The sample was, thus, accidental and unbiased.

**Stage One :**

Some words which are in common use form part of terms having a technical connotation in Science just as some such words form part of terms having a technical connotation in Commerce. In consultation with teachers of Physics and Chemistry at Pre-University Science, a list of terms made of words which are capable of being taught, independent of the technical shade of meaning they carry when used as part of technical
scientific terms, was prepared. Ten such terms, more suitable for the purpose than the rest, were selected from the pool collected in consultation with the subject-teacher. The suitability was determined on the bases of the probable unfamiliarity of their component words to the group and the teachability of these words in their broad sense. The technical connotation of the terms was understood by the investigator from the subject-teachers.

The group was given the list of the ten terms (Appendix D-1) and was asked to write against each term its Gujarati equivalent or to explain the concept implied by the term briefly in Gujarati. The students were asked to complete this as early as possible but no time-limit was set. As they returned the list one after another, they were asked to await the second stage of the experiment.

Stage Two:

The terms were made up of 25 words. The students were likely to be unfamiliar with 20 of them. At the second stage of the experiment, now, the students were given a list of these words glossed in Gujarati (Appendix D-2). The twenty words were, then, taught. Excepting a couple of words like "Converage (v)" and "Crystal (n)", the illustrations were drawn, during
explanation, from non-technical contexts. "Don't try to get down when the train is in motion."

for example, illustrated "Motion (n)", and "Average runs made by Gavaskar" illustrated "Average (adj)". Even words like "Converge (v)" and "Crystal (n)" were taught so as not to give a direct clue to the recognition of the terms made up of these words. The explanation, oral as well as written, was directed at giving the broadest meaning of the item concerned. Besides, some of the technical terms they made up were known in the mother tongue by words so uncommon and learned that average students could not be expected to establish any connection between the broad meanings of the separate words and the special meaning suggested by the term they made up.

The impact of the vocabulary teaching on the students' power of recognizing corresponding technical terms was measured in the following way. The students were given the same list of terms mentioned in Stage One on fresh copies. Again they were asked to write against each term its Gujarati equivalent or to explain the concept implied by the term, briefly in Gujarati. Though the students were asked to complete writing as early as possible, no time-limit was set. Even before the period ended, however, they had completed writing.
Results:

A comparison between the students' performance in recognizing the terms at the first stage, which preceded the teaching of the related vocabulary, and that at the second stage, which followed the teaching, could indicate the impact of the teaching of the relevant vocabulary items on their power of recognizing the terms these vocabulary items made up. The group's performance at the two stages has been shown below in Table 5.2. The gain, mentioned in the last column, is the percentage of the difference between column one, stage one, and column one, stage two.
<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Term</th>
<th>Stage One</th>
<th>Stage Two</th>
<th>GAIN (in Percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>of Students Who Recognized the Term</td>
<td>of Students Who Could Not Recognize the Term</td>
<td>of Students Who Recognized the Term</td>
</tr>
<tr>
<td>1.</td>
<td>Average Resistance</td>
<td>33</td>
<td>67</td>
<td>92</td>
</tr>
<tr>
<td>2.</td>
<td>Complementary Colours</td>
<td>8</td>
<td>92</td>
<td>92</td>
</tr>
<tr>
<td>3.</td>
<td>Converging Lens</td>
<td>33</td>
<td>67</td>
<td>79</td>
</tr>
<tr>
<td>4.</td>
<td>Extra-nuclear</td>
<td>0</td>
<td>100</td>
<td>83</td>
</tr>
<tr>
<td>5.</td>
<td>Law of Conservation of Energy</td>
<td>67</td>
<td>33</td>
<td>100</td>
</tr>
<tr>
<td>6.</td>
<td>Organic Qualitative Analysis</td>
<td>0</td>
<td>100</td>
<td>83</td>
</tr>
<tr>
<td>7.</td>
<td>Projection Lantern</td>
<td>4</td>
<td>96</td>
<td>29</td>
</tr>
<tr>
<td>8.</td>
<td>Relative Motion</td>
<td>37</td>
<td>63</td>
<td>83</td>
</tr>
<tr>
<td>9.</td>
<td>Tetragonal Crystalline Form</td>
<td>8</td>
<td>92</td>
<td>88</td>
</tr>
<tr>
<td>10.</td>
<td>Uniform Acceleration</td>
<td>4</td>
<td>96</td>
<td>71</td>
</tr>
</tbody>
</table>
The teaching of the broad meaning of the vocabulary items making up the ten terms has a discernible, favourable impact on the recognition of these terms by the group.

The gain is between 81% and 100% in the case of six terms. In three cases round 70% and in one case, it is only 26%. The gain over 80% in the case of six terms is quite satisfactory. The gain of only 70% in the case of three terms looks rather unsatisfactory beside the gain of over 80% in the case of six terms and, therefore, it needs some explanation. In one case, the students failed, it appears, not in comprehension but in knowledge. The Gujarati term meaning "Lens with curved outer surface" was the correct answer to term No. 3, and all those who did not write the correct answer, wrote either "Lens with curved inner surface" or "Lens with curved inner or outer surface". In the other two cases, the students have written Gujarati counterparts of only the derivations (adjective, infinitive etc.) from the English words making up the terms. Again, the score of 26% in one more case is not, it appears, indicative of the students' failure in respect of comprehension but of knowledge or inaccurate expression. Nearly all the students other than these 26% have written in their mother tongue what means "Lamp discharging light"
against the term "Projection Lantern". Probably, the students knew what the term meant but the imprecise expression does not indicate their comprehension of the term. If they indicated that the lamp projected an image, there would not have been any doubt about their comprehension.

CONCLUSIONS

The two experiments were conducted on a limited scale. They were neither extensive nor longitudinal. It is reasonable enough, however, to draw the following conclusions on the basis of these experiments:

(i) A teacher of English can teach a special vocabulary in a general context.

(ii) The teaching of special vocabulary items in a general context has a significant bearing on students' power of recognizing technical terms made up of these items.

Incidentally, the investigator recorded the following observations:

(i) When students are aware of the practical application of the learning items in English, they are highly motivated to learn them.
(ii) In Science, the Gujarati equivalents of many English terms are made up of words so learned that average students often fail to establish an automatic relationship between a comprehensible English term and its Gujarati equivalent.

(iii) As far as the Gujarati counterparts of certain English scientific terms are concerned, a set of terms acceptable to teachers and book-writers, has as yet not crystalized, with the result that the same thing, concept or phenomenon is described by one student with one phrase and by another with another phrase. This, too, handicaps one's attempt at recognizing a scientific term on the basis of a knowledge of the general meanings of the words making up that term.

The above conclusions might be challenged on the ground that the high percentage of success observed could partly be the result of a very limited amount of learning material and the hallow that generally accompanies any experiment. Such an argument cannot, of course, be summarily dismissed. The percentage of success in normal circumstances could certainly be expected to be less high,
but even if that happens, the hypothesis that the knowledge of the general meanings of words making up technical terms helps students recognize the latter, remains verified. Thus the experimentation, though modest, does make a case for teaching a special vocabulary in a general context.