

FACTORS THAT INFLUENCE
ACADEMIC PERFORMANCE OF
TRAINEES IN THE HARAR
TEACHER TRAINING
INSTITUTE

BY

DEMIS ZERGAW

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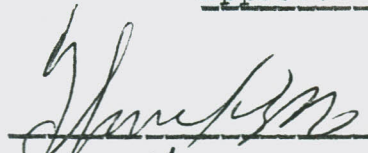
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Factors that Influence Academic
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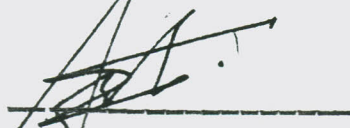
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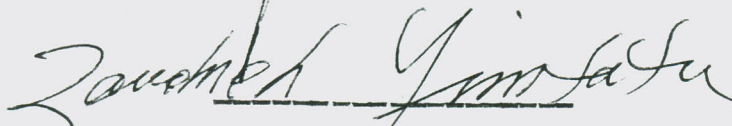
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Abstract

In an attempt made to study the effect of trainee academic background and other related factors in the secondary school upon performance in the T.T.I. and the curricular implications thereof, correlation and regression methods, questionnaires, and interviews were used. The study was conducted in order to investigate if there were any problems of poor performance and, with this, to create problem awareness and to seek solutions as well. Results have suggested that there tends to exist a problem of low level of performance in the T.T.I. They have also pointed out that this performance is an outcome not of the level of qualification of teachers, or the volume of books available in the schools from which the trainees were recruited, but of their previous level of academic achievement, and more a function of the degree of differential academic exposure. Outcomes have also indicated that the curriculum development process has not employed the steps in developing the curriculum as effectively as they should have been so as to contribute to a rise of performance to a level that could bring about a desirable level of competence. Based on these outcomes, it is recommended that the training programme should devise appropriate mechanisms that could be helpful to raise performance levels such as remedial classes. It is also recommended that the process of curriculum construction should strictly adhere to the steps that must be followed in producing the curriculum for better effectiveness with the programme it guides. At last, it is suggested that relative specialization of trainees in some broader areas of specialization (e.g. Social Science, Natural Science) could be taken as a solution to problems emanating from the effect of differential academic exposure. Of course, this is when consideration is given to trainee needs. It could be implemented by making use of such attributes of trainees as the already recorded ability, results of pretests, and identified interests as a basis for streaming into different areas or relative specialization.

CHAPTER I

BASIC ASPECTS OF THE STUDY

In this first part, those basic aspects which could give essential information on the general nature of the study will be presented. In it are included some highlights pertaining to what the problem is about, what it is intended to, the kind of importance it has and its boundaries too.

1. Statement of the problem

It is in the centre of the belief of scholars in the field of curriculum such as Tyler (1949) and Taba (1962) that the curriculum should be based upon a careful analysis of the

- needs of the society
- views of subject-matter specialists, and
- needs of the learner.

It is not without any reason that it is said the needs of these three components of the curriculum should be considered and analysed in developing the curriculum. According to Tyler and Taba, the assessment of needs is an important first step in an effort exerted to develop an effective curriculum. Because of this, it can be said that a curriculum will be effective with the educational programme it guides to the extent it incorporates this essential step in the process of its development. Failure to study the needs of the society is likely to result in generating products that may not be

useful and competent enough to help the functioning (living) society realize its objectives. Without consulting the wider society or its legitimate representatives, it would be difficult for the curriculum developer to identify the nature and right level of competence required to work and live in that society.

Absence of due consideration to the views of subject-matter specialists may result in being far away from meeting required standards of achievement. Their views are very important in order to know and determine the level of mastery of subject-matter that is possible at any given level. The incorporation of their views, therefore, guarantees the inclusion of areas of study and optimal requirements necessary to master them which could lead to better attainment of educational objectives.

If one fails to identify the needs of the learners one may not be able to know what areas of knowledge and learning experiences to offer, how to offer, and to what magnitude to offer. All these are areas of concern which should be closely investigated if maximal attainment of educational objectives is the case in point. That is why one may say that if problems in any way related to any one of the three components are not identified and given appropriate solutions, a programme in education is highly unlikely to be effective as desired and intended.

In accordance with the views expressed above, an evaluation of the curriculum should start and be seen in the light of what

has been done to include the needs of the three major components. However, for purposes of this study, the main concern is examining whether or not the needs of the learner have been included in the curriculum development process.

In relation to student needs, researchers such as Norman I. Hernandez (1973) claim that in any model for curriculum design, an important component is the assessment of student needs. This has to be done regardless of the educational type and level in which a student finds himself. To him, student levels of achievement, interests, aspirations, aptitudes, family backgrounds, etc., are but a few of the variables that may be considered in describing a student or groups of students. They are also among the factors to be encompassed in making an assessment of student needs. What this implies is that a programme would be effective to the extent its curriculum is considerate to student needs in their multiplicity of forms.

The primary Teacher Training Programme in Ethiopia is one of the training programmes guided by a central curriculum. It prepares candidates for the various responsibilities of teaching at the first level of formal education (1-6). Currently, candidates are recruited after having finished grade 12. It offers a one-year training leading to the award of certificates. As has already been established, its curriculum should be based upon a careful analysis of trainee needs.

Need, according to Tyler (1949), refers to the gap between what actually is and what should be. One of the areas of

student needs that should be assessed is the level of achievement that has been attained. When it comes to trainee need in the T.T.I., it finds expression in the gap between the actual level of achievement of trainees prior to starting their training in the T.T.I., and the level of achievement which should have been attained as well as required to start training and become successful. This gap should be assessed since it is one of the factors that could affect the future success of trainees. Thus, the curriculum development process must be based upon a careful investigation of this gap between previous achievement level and that needed to meet success if it is to guide the process of training much more effectively. This is what is also necessary to promote competence in trainees. The answer to the basic questions raised in this study and interview results would throw light on whether or not this step in curriculum development process has been considered. It is in this connection that we try to consider studies that made attempts to study and indicate the previous achievement levels of trainees.

What does the level of achievement of trainees (academic background) in the secondary school look like? These represent the second level of education which includes grades 7-12. In this study, secondary schools refer to senior schools comprising grades 9-12. In the ranks of studies conducted on teacher education in Ethiopia, we find a research work entitled

"A Survey of Teacher Education in Socialist Ethiopia (September, 1981)". This revealed that the quality of secondary school education was low. It also pointed out that the educational profile of students graduating from secondary schools and entering teacher training institutes showed low background levels. Although empirical data from secondary school records and other sources of evidences like researches done by other people that may have helped the study to reach these conclusions have not been reported in it, it has raised points worth further considering. Moreover, though it may not be possible to identify a researchable problem by using this survey as a source, it is still possible to exploit it as a base to establish a problem and a spring board which may eventually lead to identify the problem.

The E.S.L.C.E. results of trainees also indicate tendencies of lower achievement. In 1989, for example, the percentage of trainees who obtained a Grade Point Average of less or equal to 2.4 was 60. In the same year, it was only approximately 11 percent of the trainees who managed to secure anything greater than or equal to a Grade Point Average of 3.0 (see Appendix 5). Hence, these, somehow, could indicate trends of achievement which may be used to establish the problem and which prompt further investigation in an attempt to see the influence upon future performance.

Researches conducted elsewhere in the world such as in the U.S.A. have also pointed out that the level of prior

achievement of candidates who join training institutes has been low (Doyle Watts, 1982; Howard Nelson, 1984). Does this hold true for our case? Has the curriculum development process assessed needs? Is it based upon knowledge of the level of achievement in the secondary school?

On the basis of the above, we could assume that the level of achievement at the secondary school is low. Thus, what could then be the impact of low quality education and low level of academic background upon performance in teacher training institutes? To examine this, we then proceed to see the level of performance in the T.T.I.

In an attempt to review researches conducted to investigate the level of performance of trainees in the T.T.I., the researcher considered a research work entitled "Evaluative Research of the General Education System in Ethiopia (May, 1986)".* This hinted that the performance of trainees was relatively lower. On this basis, it recommended that some measures should be taken in order to alleviate the problem. Although the study is more of a report, and does not indicate the methods it has used to reach that conclusion such as inferential statistics, and other empirical data which could help to identify the problem, it can be said that it has some potential to create problem awareness. By so doing, it could enhance the effort made to identify the problem and seek solutions as well.

* Hereafter, it is referred to as ERGESE

That being the case, if one happens to study the performance of trainees in the T.T.I. in 1989, for example, about 41 percent of the trainees got a G.P.A. of less or equal to 2.0. Moreover, it was only 8.5 percent of them who worked their way to obtain more than a G.P.A. of 2.75. On top of that, only 0.7 percent obtained a G.P.A. more than 3.0 and none attained a G.P.A. more than 3.25 (see appendix 6).

Researches undertaken by such researchers as Doyle Watts (1982) and Howard Nelson (1984) have also confirmed the prevalence of deterioration in trainee performance in the process of training. Is this true with our case too? Has the curriculum development process evaluated the learning outcomes of trainees and identified problems of low level of performance if there are any ?

If we then assume that the levels of achievement at both the secondary and the T.T.I. levels show lower tendencies, can we say that they have any worthwhile relationships ?

As Taba (1962) has made it a point, attained capacity or prior experience influences an individual's ability to profit from current experience or practice. This is further supported by Thorndyke (1981) who advances the view that measures of past learning are from among those that can substantially predict future outcomes. Hence, is that level of performance in the T.T.I. which may be termed low a necessary outcome of previous low level of academic background in the

secondary school? Do the points of Taba and Therndyke remain consistent with the academic attributes of trainees? Has the curriculum development process based itself upon a study of the possible or real impacts of deficiency in academic background upon future performance? And, on this basis, has it suggested any measures useful to wash out the potential or actual effects?

An exploration of the literature on the area of performance at the T.T.I. level tends to indicate that relatively much deeper and broader is not known about the direction and magnitude of relationship between secondary school academic background and level of performance in the T.T.I. Moreover, apart from surveys which could possibly help to establish such a research problem as this one, there seems to exist that absence of researches undertaken to empirically and particularly examine the effect of academic background. Therefore, there appears to exist that need to establish, study, and assess the effect of the problem. It is to fill this gap left that the study is primarily conducted. To this effect, on the basis of Taba's point of view and the findings of other scholars like Fotheringham and Creal (1980), it is assumed that background affects future performance. Thus, the main thesis of this study is that low level of previous academic achievement has directly affected the level of performance in the T.T.I.

The second area of the problem is related to teacher qualification and library facility. Of the variables explaining low quality education and the resultant problems of low

level of achievement, teacher qualification and library facility tend to be among the prominent ones. The literature on this area such as Bruce Fuller (1987), and Mwanwenda and Mwanwenda (1987) suggests that the two variables mentioned have direct and significant effects on the nature of future academic work.

In his visit of the schools in Hararghe, the researcher came across variations in these factors between schools (Tables 4 & 5). Thus, in addition to low academic background, the possible impact of these discrepancies upon future performance appears to call for an investigation of this sort. These variables are also considered in this study in order to be in tune with the stand point of Hartwig Schroder (1978). According to him, the personal and material conditions of performance help to much more accurately determine the magnitude of the measurable performance accounted for by each of the variables studied. The two conditions form a unit of effectivity helpful to see the independent and relative contributions of the factors studied to the degree of performance measured. According to Schroder, the material conditions such as books and other instructional aids should be studied together with personal conditions such as ability since they have a stimulating or inhibiting effect on achievement. That is why it has been found useful to take these factors which are closely related to individual ability.

Where we have more qualified teachers, there could exist more possibility to benefit from the pool of knowledge and

experiences they have accumulated over the years of training. Better qualification is an outcome of better and more degrees of exposure in an area of study. It is on this basis that this study has taken it as its second thesis that differences in the level of teacher qualification have directly affected the degree of performance of trainees in the T.T.I.

In schools having libraries with larger and more diversified volumes of books, there would exist more access and better opportunity for students to use them for better achievement. Those lacking such a facility would be in a less advantageous position to learn more and achieve better. It is on these grounds that it has been formulated as a third thesis that variations in the degree of library facilities have positively influenced performance in the T.T.I.

The third area of the problem is related to differential academic exposure. In the literature, one can find out that differential exposure is one of the factors affecting future performance (e.g. Alexander and Judy, 1988). Thus, the curiosity to know if this is the case with our trainees led the researcher to make a survey (initial investigation) of the trainee records. Such an effort has pointed to the hint that there could be difficulties of performance arising from taking subjects in the T.T.I. they have long stopped learning while being in the secondary school. Moreover, the memorandum sent by the curriculum panel indicates that there has been such a problem (see appendix 4).

While they were in secondary schools, trainees did not have equal degrees of exposure to the courses they take in the institute. This is because they are streamed in different streams of study at the beginning of grade eleven. Students streamed in the social sciences in the secondary school stop dealing with the natural sciences at the end of grade ten. However, they are required to take them in the T.T.I. Those who take natural sciences drop social science subjects at the end of the same grade. Yet, it is compulsory to take them in the T.T.I. This shows that there is some kind of discrepancy in the level of prior exposure of trainees.

Those who were more exposed to a certain stream of study, for example, social science would be in a relatively better position to understand, assimilate, transfer, learn and achieve more in that same area. This is owing to their previous experiences. Others who lacked that exposure in the social science area could not be expected to get the same advantage as compared to their counter parts. Hence, it is assumed that such a discrepancy is highly likely to give rise to difficulties of learning and achievement. It is, thus, the fourth thesis of this study that disparities in the degree of earlier exposure termed here "differential exposure" have directly generated significant variations in performance among trainees.

In general, on the basis of the evidences obtained from trainee transcript records, the survey made (ERGESE), and theoretical considerations, it is thought that there is a problem of low level of performance in the T.T.I.

On the other hand, on the grounds laid by the survey made in 1981, E.S.L.C.E. results, and researches conducted elsewhere, it is assumed that the causes of this problem are low level of prior achievement, disparities in the level of teacher qualification and library facilities, and differential exposure in the secondary school.

2. Purpose of the Study

In view of the problem so far discussed, the objectives of this study are

- examining the relationship between the reportedly low level of achievement of trainees in the secondary school and the level of their performance in the T.T.I.
- investigating the relationship between the levels of teacher qualification and library facility on the one hand, and performance on T.T.I. examinations on the other.
- identifying and determining the order and significance of the above three independent variables in terms of their usefulness to predict the academic success of trainees in the T.T.I.
- assessing the magnitude of differences in examination scores in the T.T.I. resulting from differences in the degree of exposure to subjects of study in the secondary schools.
- analysing the implications of the answers to the leading questions of this study to the current curriculum development

process.

It is in connection with the attempt to attain the purpose of this study that the following hypotheses are formulated.

Hypotheses

In line with what is stated as regards the problem and the purposes of this study, the following hypotheses have been formulated.

1. Achievement in secondary schools is directly correlated with performance in the T.T.I. in related subjects.

2. Variations in the level of teacher qualification generate direct and significant variations in performance in the T.T.I.

3. Differences in the level of library facilities predict direct and substantial differences in the degree of performance in the T.T.I.

4. There is direct and important variation in performance in T.T.I. owing to differences in streams of study, or in the time of schooling trainees had in secondary schools.

To test these hypotheses, the concomitant specific questions have been set so that they could be answered in the course of the study.

3. Significance of the Study

Where the backgrounds of trainees tend to be low and different, it is important to diagnose the nature and the causes of the gaps in these backgrounds. The deficiencies and the variations in background should be investigated since they could be among the factors affecting future performance. Thus, data on relations (gaps) between the variables specified in the study can be of great practical significance from the point of view of the timely identification of potential or real achievement problems. With this, the study is useful because, by way of diagnosing the gaps between academic experiences and future level of performance, it helps to identify the problem or confirm its existence. The identification of the problem assists all those concerned to be aware of the problem. Put differently, it will be possible for them to know the existence (presence) of the problem.

Investigating relationships between the variables mentioned and identifying the problem is also helpful to recognize the problem. In other words, it leads to that step of seeking solutions to the problem. Hence, the study is useful from the point of view of developing strategies for dealing with under achievement. By way of showing the extent to which curricular objectives are being attained, it helps the curriculum planner to know this and other areas of strength or weakness in the curriculum. It is, then, on the basis of this kind of relevant information that the curriculum planner may

- Properly determine how the curriculum should be planned and implemented to the population under study.

- Attempt to make the curriculum responsive to all its components: Society, discipline, and individual.

- Suggest to teachers the necessity of establishing attainable standards, re-organising contents, employing appropriate methodology, and using expedient evaluation mechanisms that are in conformity with the level of achievement and other attributes of trainees.

- Contribute to decisions concerning placement of trainees for special treatment. This sort of treatment is more often than not expected to add to better learning.

In more concrete terms, it is expected that the study could be of some help to the personnel in the teacher education panel of the Institute for Curriculum Development and Research. This is by way of enhancing their effort made to identify and formulate tangible curricular objectives. Such a task of formulating objectives is likely to proceed smoothly only after some information is obtained regarding the level on which objectives can be reached by the trainees. Besides, this kind of task necessitates some sort of information essential to determine the emphasis that may be required in the light of prior experience of trainees.

At last, the importance of the study stems from the fact

that the variables are among the key factors in achievement, and important areas of research and scholarship. Moreover, higher achievement is still required in training institutes. This is sufficient reason to devote attention to issues pertaining to it. Quite naturally, as a correlational study, it serves as a vehicle for raising other questions or for providing a degree of focus for further research. In general, the study helps to identify the problem and seek solutions to it too.

4. Delimitation of the Study

The study was conducted in one teacher training institute. Including more than one institute involves visiting several schools from which candidates were drawn. And, this requires much more time than was available for the researcher to carry the work out in line with the time it was supposed to be due. Hence, the urge to bring compatibility between the time available and that specified for completion of the study confined the scope of the research to a single institute.

True as it is, the variables included in the study are not the only ones attributable for good or bad performance. The list comprises interest, socio-economic status, parental expectation, amount of assigned work, etc. However, because the population of the study are not those currently in the pipeline, only those factors which characterize them, and which are available in school documents are taken as variables affecting their performance in this study.

The study, therefore, is not concerned beyond the bounds that would be set by the interaction between those three independent and one dependent variables. In view of this, one could not take the liberty of saying that it is comprehensive enough to support sweeping generalizations.

5. Limitations of the Study

The researcher has found it difficult to conduct the study in the way he wanted due to the

- scarcity of related studies conducted at the level of primary teacher training institutes
- shortage of related literature particularly as regards teacher qualification and library facility
- absence of standard or similar practice on the classification of teacher qualification and books by subjects.

The above are the main constraints.

CHAPTER II

RESEARCH METHODOLOGY AND PROCEDURE

The study belongs to the wider family of descriptive research. It is concerned with describing the problem and finding relationships too. Thus, it involves descriptive statistics. This is used to describe the attributes of samples such as scores obtained from secondary school examinations. It also includes inferential statistics to draw conclusions about the population on the basis of the findings about the sample. It is to this effect of predicting interaction effects that the study employs correlational technique and regression analysis. It also comprises the comparison of mean performance in order to determine the direction and degree of relationship between the variables included in the study, particularly as regards those involved in cases related to differential academic exposure.

1. Sources of Data

Data were gathered from student transcript records, documents in school record offices and school libraries, and official examination records in the Harar T.T.I. Data were also obtained from questionnaires administered to T.T.I. instructors. Interviews were used as a source of data by conducting them with an expert in the teacher education panel of the Institute for Curriculum Development and Research, and the principal of the Harar T.T.I.

2. Samples and Sampling Procedures

The population of the study are those trainees who graduated from the Harar T.T.I. in 1986, 1987, and in 1988. These three consecutive years were taken because of their relative recency. Besides, it was assumed that taking samples from three successive years could be representative enough to investigate and determine interaction effects and degree of relationships between the variables considered in this study. This representation is taken as adequate when reference is made to the number of years that has elapsed since the Survey of 1981 (upon which this study is based) was undertaken.

Harar T.T.I. was selected from among the T.T.I.'s primarily for more accessibility of data. Second, it is selected because a relatively larger size of candidates comes from a single region in which the T.T.I. is situated, the Hararghe administrative region. This may be because of the larger number of schools found in this region (10). In other T.T.I.'s, the number of candidates coming from the administrative regions in which the T.T.I.'s are stationed is far less than that of Hararghe. The attempt to increase the size of the sample, therefore, necessitates including other administrative regions beyond the ones in which the T.T.I.'s are found. This, in turn demands much more time than was available for this research to be accomplished and submitted as scheduled.

Harar T.T.I. recruits a relatively larger number of trainees from a relatively smaller number of schools.

As regards other T.T.I's, a larger number of trainees which is the equivalent of the percentage required for this study is not drawn from a relatively smaller number of schools. A manageable number of schools (7) in Hararghe supplies most of the trainees to the Harar T.T.I. as compared to the schools in different administrative regions recruiting students for the same T.T.I. Thus, this need to reduce the number of schools to be visited so as to be in tune with time factors and also to conduct indepth and much more detailed study have been the other reasons for selecting the Harar T.T.I. Although Harar T.T.I. may not be a typical representative, it has been selected because of the mentioned advantages it lends to this study. The following table gives some idea about the population and the samples.

Table 1: Total number of trainees and percentage, and number of samples¹

Year	Total number of trainees	Number of trainees from Hararghe	Number of samples	% of the population
1986	585	130	39	30
1987	432	181	54	30
1988	363	131	39	30
Total	1380	442	132	30

The samples are drawn from the secondary schools in Hararghe. As has already been pointed out these schools are the most dominant pools for the Harar T.T.I. The remaining

candidates are widely scattered in various schools over the administrative regions of 'Shoa', 'Addis Ababa', 'Arsi', 'Gamu Gofa', 'Assab', and 'Sidamo'. The number of trainees coming from a single school in these administrative regions is very small. Including samples from these schools obviously requires including very many schools. And this necessarily demands much more time than was available for conducting an indepth study. Due to this, it has been difficult to include samples from them.

Of the ten secondary schools in Hararghe, the first seven have been taken for the purpose of this study. They are selected on the basis of the number of candidates they sent to the T.T.I. as the following table shows:

Table 2: Number of trainees by school²

Year	1986	1987	1988
Medihanialem	30	37	19
Harar	30	36	31
Dire Dawa	6	42	31
Chercher	30	20	16
Jijiga	9	17	11
Gelemso	17	22	18
Girawa	8	7	5
Deder	7	6	5
Gursume	3	6	5
Hirna	-	5	5
Total	140	198	146

Approximately 30 percent of the population has been taken as the percentage of samples to be included in the study. This is in line with the suggestion of Kerlinger (1973). Hence, taking approximately one-third of the population from the selected Hararghe schools could make the samples representative enough to yield the data required. Accordingly, the total number of samples is 132. As regards the interaction between previous academic achievement, teacher qualification, and school library on the one hand and performance in the T.T.I., the unit of analysis is the individual trainee.

Probability sampling of the stratified type is employed to select samples. This technique of sampling has been used since there are different categories of trainees entering into the T.T.I. at any time. To this effect, streams of study pursued at secondary school are used as the basis of stratification.

Depending upon what they studied, the samples are grouped into the Social Science and Natural Science groups. The vocational stream is not considered in this study. This is because the trainees in this category, as can be seen from the table next page, do not constitute a considerably large percentage of the whole training population (6%). Moreover, there tends to exist lack of consistency in the subjects they took while being in the secondary school. While some take Chemistry, others do not. A certain number of them takes Biology or History while others do not. This added more

difficulty to the effort exerted to include them as a homogeneous group in the study. Eventually, they were excluded.

The already determined percentage (30%) is still consistently used to find out the effect of differential academic exposure upon performance in the T.T.I. The unit of analysis in this respect is the group. Thus, when we take proportionally representative number of samples from each group, we have a total of 98 Natural Science students (about 30% of 330) and 34 Social Science students (about 30% of 112) which add up to a sum - total of 132.

To select samples from each stream, systematic sampling has been used. Thus, after arranging the names alphabetically, trainees appearing on every fifth serial number have been selected. The table next page is believed to give the picture more vividly.

Table 3: Number of Hararghe trainees by Stream of Study and Samples taken³

Year	1986					1987					1988					Total				
Stream	N.S	S	S.S	S	V	N.S	S	S.S	S	V	N.S	S	S.S	S	V	N.S	S	S.S	S	V
Medihanealem	29	9	1	-	2	33	10	4	1	4	8	2	11	4	5	70	21	16	5	11
Harar	27	9	3	1	-	33	10	3	1	-	26	8	5	1	-	86	27	11	3	-
Dire Dawa	5	1	1	-	1	38	11	4	1	3	28	8	3	1	7	71	20	8	2	11
Chercher	21	7	9	3	2	18	5	2	1	2	11	3	5	1	3	50	15	16	5	7
Jijiga	5	1	4	1	-	9	3	8	2	-	4	1	7	2	-	18	5	19	5	-
Gelemso	8	2	9	3	-	7	2	15	5	-	6	2	12	4	-	21	6	36	12	-
Girawa	8	2	-	-	-	4	1	3	1	-	2	1	3	1	-	14	4	6	2	-
Total	103	31	27	8	5	142	42	39	12	9	85	25	46	14	15	330	98	112	34	29

Key

- N.S. - Natural Science
- S - Sample
- S.S. - Social Science
- V - Vocational

3. Procedure of Data Analysis

This study embraces three independent and one dependent variables. The independent variables are trainees' prior academic achievement, teacher qualification, and library facility. The dependent variable is T.T.I. academic performance. The relationship and prediction are investigated in all eight academic subjects. To this effect, tests of statistical significance (t - tests) are administered. Details about these variables are presented below.

3.1. Prior Academic Achievement

This is taken and treated as an independent variable influencing the future academic performance of trainees. The expected direction of that influence is that previous degree of academic achievement is directly related to future performance in the same subject.

Prior academic achievement in this context is an average of each sample's scores in a subject in all four secondary grades. i.e. high school score average. Thus, a single achievement score for each sample is derived in each of the six secondary school academic subjects.

Achievement is used here to refer to performance on teacher - made tests of school achievement. For the study considers the need to see the achievement of trainees in all

and the future. The following symbols represent achievement test scores in the secondary school:

X11 - Amharic	X15 - Chemistry
X12 - English	X16 - Physics
X13 - Mathematics	X17 - Geography
X14 - Biology	X18 - History

3.2. Teacher qualification

This is the second variable thought likely to influence future performance. It appears necessary to consider the qualification of teachers by taking into account that of all the teachers who taught the trainees in all their secondary grades. Most schools do not have these records. Moreover, while some have a record of this in 1984, for example, others do not have it for the same year. Therefore, owing to the serious limitations in the availability of this kind of relevant and comparable data, the researcher has found it imperative to consider this in other terms. This is in terms of the number and qualification of teachers available to teach the concerned subjects while the candidates were in their grade twelve.

The effect that teachers would help to bring about by working with a certain group of students in one year's time may not be that high. Taking only one year may not be as useful as that of a more number of years in order to clearly find out interaction effects. It would be much more preferable

to take more so. Yet, this has not been possible. However, as long as there are variations in the level of qualification, we would expect the occurrence of, at least, minimal interaction effects. Moreover, although what students benefit out of the work of their teachers only in grade twelve may not result in tremendous changes in their level of achievement, it can be argued that it could have some minimal contribution to the level of achievement they have already had. It is with this understanding that the researcher has considered this variable in terms of teacher qualification in grade twelve.

This independent variable is assigned values ranging from 0 to 2. The basis for this assignment is the number of years of tertiary training. On this ground the qualification of teachers is put under two categories: degree and diploma. The number of teachers with qualifications other than B.A. (B.Sc.) and Diploma (12+2) has been very small and insufficient enough to deserve consideration. These teachers with levels of tertiary training, for example 12+1 are almost non-existent in the schools in grade 12 too. That is why they are not included in the study.

It was also difficult to get the level of qualification of teachers by subject level. Neither the school directors nor the record offices were able to provide accurate information on that apart from the sum - total figure on a given level of qualification. Due to this, a single common value is assigned to this variable for all subjects in a given

school from which the samples are drawn.

To assign the values just mentioned, the proportion of degree level teachers to diploma level ones has been calculated. The less the ratio of the former to the latter, the more the level of qualification. Accordingly, the value assigned is 2. A larger ratio reveals that the number of diploma level teachers exceeds that of their counterparts. In this case, the value assigned is 0. Where we have approximately a 1 to 1 ratio, the statistical value of 1 is assigned. The following table shows this:

Table 4: Number of teachers by level of qualification
and values assigned⁵

	1985				1986				1987			
	B.A (B.Sc)	Dip.	Ratio	Value	B.A. (B.Sc)	Dip.	Ratio	Value	B.A (B.Sc)	Dip.	Ratio	Value
Medihanealem	6	8	1:1.3	0	9	3	1:0.3	2	11	4	1:0.4	2
Harar	4	4	1:1	1	4	4	1:1	1	3	5	1:1.6	0
Dire Dawa	7	8	1:1.4	0	5	7	1:1.4	0	6	7	1:1.2	0
Chercher	8	3	1:0.4	2	8	3	1:0.4	2	8	3	1:0.4	2
Jijiga	5	3	1:0.6	2	4	5	1:1.3	0	6	4	1:0.7	2
Gelemso	3	5	1:1.6	0	4	4	1:1	1	4	5	1:1.3	0
Girawa	5	3	1:0.6	2	5	3	1:0.6	2	6	2	1:0.3	2

3.3. School Library

This is the third variable assumed to have direct effects on future performance. It is measured in terms of the volume (number) of books available for use in the school libraries.

There are some problems with this variable. The most important one is that there is that absence of agreement on the way how books are classified. In some schools, the classification is by subjects. e.g. Amharic, Geography, Physics. In some others, it is by areas of similar content. E.g. Natural Science, Social Science. Still, in others, it is by some broader areas. e.g. Vocational, academic. Thus, while Geography, for instance, is classified alone in some schools it is classified together with History in others. Such a practice made it difficult to investigate the impact of the availability of books separately at subject level. Hence, the search for a common denominator has led the researcher to classify these subjects considered in this study under academic subjects. With this, their impact is treated as a whole by assigning the same value to all subjects with regards to a given school.

Of course, the point that should be made known is that with two exceptions (Medihanealem and Gelemso), the remaining librarians in the schools studied are not professionals.

In this study, the median and the semi-inter quartile range are chosen and used to show the dividing line between

schools highly or poorly stuffed with books. Where the volume of books is larger, that is, in a case where it is in the third quartile (Q_3), the school is taken as better and thus given a statistical value of 2. In cases in which the figure is between the third quartile and the first quartile (Q_1), the value assigned is 1. To those in the first quartile, 0 is given. The following table shows this:

Table 5: Volume of books by school
and values assigned⁶

School	1985	1986	1987
Medihanealem	4615 - 2	4830 - 2	4973 - 2
Harar	2842 - 1	2942 - 1	2954 - 1
Dire Dawa	4766 - 2	4846 - 2	4979 - 2
Chercher	2564 - 1	2753 - 1	2925 - 1
Jijiga	2615 - 1	2702 - 1	2960 - 1
Gelemso	638 - 0	766 - 0	827 - 0
Girawa	496 - 0	852 - 0	903 - 0

3.4. Dependent Variable

This refers to the criterion variable. It is trainee performance in the T.T.I. It is measured by grade point average attained at the end of second semester on annual courses. In calculating trainee GPA on each criterion variable, letter grades obtained at the end of both the first and second

semester were first converted into numerical values. The numerical values were then multiplied by the number of credit hours given to that course. The two results were added up. Finally, the sum - total was divided into two for each criterion in order to yield trainee GPA on that criterion. The courses for which GPAs were calculated are Amharic, English, and Mathematics.

As regards terminal courses, semester grades were first converted into numerical values. The numerical values were then multiplied by the number of credit hours allotted to that criterion. It is this final figure which represented trainee performance. The terminal courses for which this was calculated are Biology, Chemistry, Physics, Geography, and History.

With the exception of Chemistry and Physics, the rest are 3 credit hour courses. The following symbols represent trainee performance scores in the T.T.I.

Y11 - Amharic	Y15 - Chemistry
Y12 - English	Y16 - Physics
Y13 - Mathematics	Y17 - Geography
Y14 - Biology	Y18 - History

Regression and correlation techniques have been used to determine and explain the direction and magnitude of relationship among the variables. These statistical tools are profitably used after the researcher has established tentative

descriptive hypotheses regarding the associations that may exist among related variables.

Correlation coefficients have been employed to indicate the relationship of the dependent variable with each one of the independent variables. Analysis of variance using multiple regression procedures has been employed as the primary method of analysis in an attempt to provide for a Beta-analytic study of the effect on future performance of the interaction between prior academic achievement, teacher qualification, and library facility. These same procedures have also been used in order to determine the contribution made by each one of the predictor variables to the accountable variance and the order of their predictability.

3.4. Differential Academic Exposure

Since they do not usually pursue their study of Geography and History up to grade 12, Natural Science students' general academic background constitutes their achievement in Amharic, English, Mathematics, Biology, Chemistry and Physics. Conversely, Social Science students do not continue their study of Chemistry and Physics upto grade 12. However, because most take Biology, this is also incorporated in their background. Thus, their general academic background encompasses Amharic, English, Mathematics, Biology, Geography and History.

There are obvious differences in the degree of exposure of Natural Science and Social Science students in their respective

areas of study. Thus, differential academic exposure in this context refers to higher or lower degrees of exposure to fields of study in the secondary school. The anticipated direction of the influence is that relatively more exposure to a field of study chosen and pursued at the secondary school is directly and substantially related to future performance in the T.T.I.

To investigate the impact of differential exposure, the T.T.I. performance of Natural Science students in Social Science subjects is compared to that of students with Social Science academic background. Also compared is the T.T.I. performance of Social Science students in natural science subjects with that of Natural Science students. To this effect, the means and standard deviations of Biology, Chemistry, Physics, Geography, and History are computed for all trainees and, then, for trainees in each group.

The comparison is made in terms of the number of standard deviations a given group's mean performance is away from the common mean obtained. The figures for these comparisons are obtained from grade points on tests administered to trainees presumed to have had varying degrees of exposure to the areas tested.

At last, results of data from questionnaires and interviews are analysed and interpreted along side the above where they are found relevant and appropriate. It is believed that these data would more explicate the effect of the variables on one another.

CHAPTER III

REVIEW OF THE RELATED LITERATURE

In this chapter, attempts will be made to present and review some of the literature related to the topic of this study. It is hoped that this review provides the highlights on what concerns the topic. It is this which is supposed to form the theoretical framework which guides the empirical research.

Academic Background: A Controversy between Innate Ability and Prior Achievement

Academic background of students at any level in the educational ladder refers to the knowledge, attitudes, and skills acquired. When one speaks about the academic background of trainees in the T.T.I., one is obviously referring to the knowledge, attitudes, and skills they have acquired and developed over the years before entering into the T.T.I. Accordingly, when one says the academic background of trainees is stronger, for instance, one is indicating that the level of knowledge, attitudes, and skills they have previously acquired is higher.

In order to determine the strength or weakness in the academic background of trainees, we usually resort to investigating the scores they obtained in their secondary schools. However, these scores obtained, depending upon the purposes

for which they are used, may possibly reflect interest, aptitude, motivation, etc. among many others.

For the purpose of this study, trainees' examination scores are taken as reflections of their academic achievement, and of their academic background. It is in this connection that the controversy comes to the scene: do these scores represent concepts, values, and skills acquired as a result of the innate ability of trainees? or, do they reflect learning outcomes acquired as a result of prior achievement?

Every individual has his own inherent potential to learn. One learns because one has that inborn ability to learn. The amount he has learned as represented by test scores, then, reflects the magnitude of his natural ability to learn. Hence, according to the advocates of this standpoint, variations in performance are due to differences in intelligence, innate ability to learn. In conformity with this belief of theirs, they assert that it is innate ability that determines achievement. To quote a view from the study of Chalip and Sigler

Psychologists contrive to grapple with two contrasting models of the relationship between achievement and intelligence. The traditional psychometric conception (e.g. Burt, 1955; Cattell, 1971; Spearman, 1972) holds that intelligence is a characteristic of organisms and can be measured independently of content, context, and culture; that measured intelligence is indicative of underlying innate mental processes that determine the individual's intellectual power; and that achievement is largely determined by one's intelligence, perhaps in addition to other less important factors. In short, ability causes achievement.⁷

According to Chalip and Sigler, the above traditional psychometric view holds that novel tasks accurately assess intelligence without confounding it with the effects of prior learning. Thus, intelligence is central to it. However, it may be argued that although novel tasks could assess intelligence by excluding the effects of prior learning in a particular area of study, it seems difficult to take out the effects of general intellectual skills of analyzing, synthesizing, evaluating, for example, from tests of intelligence. Performance on novel tasks could not be free from the influence of such skills that have been well developed and sharpened in the course of learning.

The traditional psychometric view is also supported by Campbell and Boruch (1975), and Kenny (1975). They claim that ability may be taken as a pre-requisite to achievement. They stress that the rate of achievement may also depend on initial ability levels. Therefore, according to them, students with higher ability show more achievement gains than do students with lower ability. Hence, it is ability that test scores primarily represent. However, one can argue that although initial ability does matter, this does not in any way imply that the scores are totally free from the effects of prior achievement.

In general, the points of view adhering to the traditional psychometric conception give a place of utmost importance to innate ability as a prime necessity to future achievement.

Indeed, ability has a certain role to play in determining the degree of performance. But, what matters with regard to these points of view is their tendency of overlooking the significance of attained (acquired) ability or previous experience as one of the crucial factors capable of generating newer and higher abilities.

As one learns, one could be expected to achieve a higher level of experiences. These experiences, in turn, facilitate the way to achieve much more and higher learning. Taken this way, it is prior achievement that primarily determines the magnitude of future performance. Hence, according to the proponents of this view, differences in test scores are reflections of differences in the degree of accumulated experiences or degrees of prior achievement. That is why they believe it is achievement that determines ability. To cite a view of this kind again from the study of Chalip and Sigler

An alternative view (e.g. Ferguson, 1954, 1956; Hunt, 1961; Vgotsky, 1962, 1978), makes the opposite assertion, namely that achievement causes ability. This view holds that the tests used to assess intellectual ability are not different in kind from tests used to assess achievement, except that they tend to be novel whereas achievement tests are based on material that has been taught.⁸

According to Chalip and Sigler, the alternative view holds that performance on novel tasks can best be conceptualized as transfer from learning in achievement contexts. Thus, learning is central to it. As to this view, characteristics of an

individual's learning will, to a larger extent, explain future performance on novel transfer tests, that is, tests of ability.

Supporting the alternative view, as indicated by Chalip and Sigler.

Antonack, King, and Lowy (1982) find high synchronous correlations between I.Q. and student achievement, but they observed that achievement is better predicted by previous achievement rather than by I.Q. Early school achievement, not I.Q., is both the better predictor of later school achievement, and a more adequate criterion of explaining discrepancies in performance.

The group of views that supports the alternative view emphasizes upon prior achievement to the neglect of ability. Prior achievement has its part in affecting performance. But, as many researchers (e.g. Schroder, 1978:107; Walberg and Tsai, 1985:159) have pointed out, ability also has an important role to play in the determination of the nature and magnitude of performance.

When one learns, his potential would be involved in his learning. The interaction of this potential to learn with what is to be learned in the learning atmosphere is likely to result in a certain kind of achievement. When the degree of achievement is measured at a later date, the scores tend to reflect results which are expressions of both learning ability and experiences of learning gained. The differences in test results then reflect differences in innate learning abilities and the amount of prior learning acquired. That appears why

another group of researchers with an eclectic view has pointed out it is difficult to separate one from another.

This third group of researchers believes that general ability and prior learnings are all important. It even suggests that it is difficult to differentiate one from the other. One of them is Anastasi (1958). Chalip and Sigler indicated in their study that Anastasi pointed out intelligence and experience are analytically but not ontologically (essentially) independent. Anastasi further noted that ability and achievement are inextricably inter - woven in the ontogeny of the organism.

Chalip and Sigler also share the views of Anastasi. They hold the idea that achievement and ability are confounded in real world data. As Anastasi suggests, it may be possible to make a distinction between them for purposes of describing and analyzing them. However, when it comes to results of tests, it would become difficult to distinguish the effects of one from those of the other. This is because in any test administered to measure ability, there may be little possibility of finding out if students have not been able to transfer and use what they have previously achieved.

According to Chalip and Sigler, achievement is measured by recording the school grades and scores each student receives in various subjects. Ability is measured by intelligence tests. Yet, they argue that there is substantial evidence to show that ability measurements are affected by prior

experiences. They go further to claim that education is known to enhance scores on ability measures too. That is why they have claimed that "It appears that measures of ability are, to a greater or lesser degree, proxies for experience..."¹⁰

Gronlund (1981) supports the foregoing stand point of Chalip and Sigler. He remarks that there is no way to distinguish learning ability (intelligence) from what one has learned. As a result, usually the two are taken together. He adds that undoubtedly the test performance reflects inherited characteristics (innate ability) to some (unknown) degree. But, it also reflects the individual's experiential background too. According to him, this background factor is also a part of the individual's present ability to perform and as such affects both his test scores and his school achievement. He notes that this background factor can be modified by training, and therefore both learning ability and school achievement can be improved.

Test results could not reflect only innate ability as there is the effect of learning or what one has learned. On the other hand, scores may not indicate results of learning (achievement) only as the amount of learning depends to a certain extent on the ability to learn. That is why both should be taken as constituent parts of test scores which represent trainee academic background.

The case in point is the score of trainees which they obtained while being in secondary schools. It is necessary to

determine what these scores represent so as to be clear with what is embraced in academic background. Once this is made clear, it would be possible to investigate the effects of these factors embraced in academic background upon future performance. Thus, in line with the views expressed by Anastasi and Gronlund, in trainee academic background we find being confounded both learning ability and prior achievement results. Subscribing to these views and the reasonings given by Chalip and Sigler, the scores which represent academic background are taken by this study as representing both ability to learn as well as prior achievement. This academic background is taken to be one of the variables that directly influence future academic performance.

2. Prior Academic Achievement as a Basis for Future Academic Performance

of

A large number of researches has established the idea that prior academic achievement is one of the key, if not the primary, factors determining the future progress of students at various levels of learning. This is not without any reason: What one has learned increases the stock of knowledge and skills one possesses. It also results in increasing the academic ability of the learner. And, this increase is highly likely to be of great help in the effort to withstand the rigours of future learning. This study, based on this assumption, suggests that higher previous achievement results in better future performance while the converse generates poorer

outcomes. To see what other researchers have found out in relation to this, some are treated below.

Of the works reviewed in this study, we find that of Frymier and Thompson. They theorized that "... achievement in school is a function of past experience and present experiencing."¹¹ Their view is here based on theoretical considerations. This may imply that when it comes to practice achievement may not be a function of past and present experience. However, it can be argued that even on practical grounds, the experience one gets, be it in the past or the present, has a great deal of influence upon future results. This is empirically supported by what Karl Keefer (1969:53) studied.

Karl Keefer investigated the accuracy and stability of the self-prediction of academic achievement by college students as compared with prediction based on the score on a standardized college entrance test, the high school G.P.A., and the most recent college G.P.A. In this he suggests

The accurate prediction of academic achievement remains an unsolved problem in education. Such prediction is particularly needed for decision-making about college entrance and retention. A search of the literature shows that the quest for variables which will yield valid predictions usually begins with intellectual factors, principally prior grades and test scores.¹²

In the study he conducted with 154 under graduates, he concluded that the accuracy of prediction based on pre-college

achievement remains consistent at least, for nine months. That seems why he emphatically claimed that under all circumstances, the best prediction of future performance comes from past achievement.

Keefer has found out that accurate prediction works upto a period of nine months. But, it is clear that some of what one has learned in the past (e.g. ability to analyze facts) could serve one as long as the end of one's life as marked by biological death. On the other hand, there may exist some other elements of past learning which could affect future learning only to a very limited extent. Factual learning falls in this latter category. Thus, the failure to predict for a longer period of time than nine months may not exclusively be explained by the lack of accuracy in the predictive validity of prior achievement. Rather, it could possibly be attributed to the nature of the things learnt and the kind of skills mastered among many others.

As Keefer suggested, accurate prediction is really very difficult more often than not. This is because there are several factors which could affect accuracy in prediction and which may be difficult to control as the case may be. However, it may be said that there is some room to find out relatively accurate predictors by trying to minimize the effect of uncontrolled factors. One is increasing the size of the samples. Another could be increasing the number of variables as Keefer himself suggested. Increasing samples and variables

is one of the practices used in an effort to increase the size of the correlation coefficients. In any case, we still see in the study of Keefer prior achievement predicting future performance.

In the study they conducted, Aspy and Huston (1972:57) advanced the view that student performance are generally enhanced by success and retarded by failure. They summarized the research of purkey and stated that "There seems to be widespread support for the general position that success is an essential ingredient of positive human growth and development."¹³ They defined success as a student's correct performance as assessed by his teacher.

A successful person is, one can assume, a person with a higher achievement record. And, this higher result is highly likely to generate better future performance record. Understood in this way, their argument sounds logical and is in line with the major hypothesis of this study.

Biggs' and Johnson's study concerned itself with measuring the self-made predictions of entering junior college freshmen. Their study tried to relate these predictions to past and future academic performance, as well as to measures of scholastic aptitude. Their study yielded the result that previous academic performance (as measured by the student's percentile rank in his high school class, and at the end of his junior year) had the highest correlations with future

performance (as measured by the student's G.P.A. at the conclusion of the first quarter in college). In their study "... a measure of academic aptitude and past performance are the most highly related and best explain future junior college performance."¹⁴

The result of the above study of Biggs and Johnson supports the findings of previous researches in that prior ranks and scores were found to be the best predictors of future performance. Thus, these outcomes call for giving due consideration to trainee past achievement. By virtue of this, they should also be taken as one of the major concerns by every planner and teacher in education. This is mainly because earlier achievement provides the necessary background for future learning tasks.

Thorndyke (1981) also seems to have the same opinion. He stresses that students who have better achievement in any previous grade in any given subject tend to have better achievement in any later grade. He also notes that initially abler students do better than their counter parts, and this is universally the case. As regards the importance of past achievement, he points out that "As children progress through the school system, they move closer to and finally reach, points of decision concerning future educational plans. Past achievement is certainly one type of information that should influence such decisions."¹⁵ Implicit in this is the assumption that prior achievement is the one indicating the direction for effective future performance.

To show the place of importance of background in test scores, he writes "... it must be recognized that any test of performance is in some degree a function of the individual's background of experience."¹⁶ Regarding the validity of this background information as a predictor, he further notes "The point that needs to be recognized is that past achievements as represented by present performance, often have a good deal of validity as a predictor of future utility. Thus, high school grades consistently have been found to be among the best predictors of future college grades."¹⁷

All the studies reviewed, to a greater or lesser degree, subscribe to the idea that one's prior achievement is among the most important factors that determine one's future performance. With this, they support the thesis of the study. And, it is on this basis that the researcher has set out to investigate the case with prospective teachers.

It is not only prior achievement that determines future performance. An individual's ability is likely to be influenced with the help given by his teacher. It is in this connection that we shall try to see the effect of teacher qualification.

3. Teacher Qualification and its Relation to Future Academic Performance

In the list of variables that could affect the future performance of trainees, we have the level of qualification

the teacher. The qualification of a teacher is commensurate to the level of schooling and training he has passed through, and to his level of preparation to stand the rigors of teaching.

Under normal conditions, variations in qualification reflect disparities in the breadth and depth of knowledge and other experiences in a certain area of training. Viewed in this way, with differences in qualification levels, we anticipate differences in levels of knowledge and abilities as well as capacities to teach in general terms. All other things being equal, a person with a Diploma in Biology, for example, and another possessing a Degree in the same field could not be expected to be on an equal footing as regards their levels of preparation to teach. The former is less exposed and minimally prepared to effectively teach Biology while the latter is more exposed and relatively maximally prepared to teach. By the same token, with what their teacher does to effectively guide and facilitate their learning owing to his level of preparation, it can be argued that students of the latter are in a more advantageous position to learn more, understand better, and eventually achieve higher.

There has been concern by concerned authorities to raise the level of sub-standard and underqualified teachers teaching at any stage in the educational ladder. This concern has materialized in the form of providing in-service training opportunity in some instances. Here in Ethiopia, those teaching at the primary, junior secondary, and senior secondary

levels have been offered opportunities to take part in summer in-service training. This training is provided to award them certificates, Diplomas, and Degrees respectively so as to qualify them to teach at the corresponding levels. This tends to signify that raising the level of qualification of teachers has something to contribute to their effectiveness. It is their effectiveness, in turn, that has something to contribute to student achievement gains. Had it not been for this, the need for in-service education and training might not have arisen, perhaps.

The teacher is the one who manages his personal and other material resources in designing learning activities in a way they could contribute to effective learning. In considerable cases, such an ability is a function of the level of preparation of the teacher. More ability is expected to result in much more effective teaching and, this, in turn, is more likely to facilitate the learning process and, with this, to raise performance levels.

Contrary to what has so far been explained, Brophy argues that teachers have little effects. He cites Stephen (1967) who theorized that "... achievement is determined by factors within students, little if at all by teachers. As late as 1972, research seemed to support this."¹⁸ This is still supported by Fotheringham and Creal in 1980. As to them, it is differences in ability and background among students that substantially determine differences in academic achievement.

They stressed that such differences as teacher qualification and experience did not seem to have a significant effect on educational achievement differences compared to initial achievement differences among students.

Had teachers had little effects, then, there would not, perhaps, have existed the need for them to have a place in schools and classrooms. Although learning is the task of the learner, it is the teacher who guides and facilitates this learning. It is the teacher who carefully selects and organises learning experiences in the way they could help the learner to achieve more instructional objectives, and to a greater and better degree. It can be argued that without the facilitating role of the teacher, which is believed to be a function of the qualification of the teacher in this case, it would probably be difficult to reach effective degrees of learning. In the absence of effective learning, one finds it difficult to think of higher and better achievement. It is on these grounds that we contend that teachers have some effects. This is particularly the case where the effects of initial achievement differences are controlled by comparing students with similar ability and background. To see unequivocal effects, of course, there is that need to control some student attributes such as the above one since they have a neutralizing effect upon the role of teacher qualification. And, it is on this ground that we find the theory of Stephen and the assertion of Fotheringham and Creal questionable.

While accepting the idea that student background characteristics have strong effects on school outputs, Glasman and Biniaminov, nevertheless, stand in opposition to the arguments of Brophy. Citing Coleman and associates (1969) they said that stronger teacher effects were found on achievement than all other school inputs. They also pointed out that Mayseke and associates (1972) found significant teacher influences than physical facilities, programmes and policies. One can see that what is implied in this study is the need to control student characteristics for purposes of examining teacher effects in comparison to other school inputs.

Compared to the effects of student attributes such as initial achievement differences, teachers may matter little since it is not the teacher but the student who learns. However, when student characteristics are controlled, it can be contended that teacher could have substantial effects.

Bruce Fuller (1987:33) stands by Glasman and Biniaminov and claims that teacher quality has been shown in empirical studies to consistently influence student achievement. This is also the opposite of the view of Fotheringham and Creal. According to them, students with similar ability will not tend to show any significant differences in their achievement gains owing to variations in the qualification of the teachers who taught them. As to Bruce Fuller, it seems that he supports the idea that students with similar ability tend to show different achievement gains owing to differences in the quality of teachers who taught them.

Initial ability and background are important. Teacher level of qualification is considerably, if not strongly, important. Where we have two students with similar achievement levels, one of the two being helped by a more qualified teacher is expected to achieve higher. This is because his initial achievement is more likely to be supported, enhanced, and enriched with the help rendered by his teacher. That is why we argue that it is not only initial ability and experience that is vital but also the assistance given by the teacher as a function of his level of qualification.

Torsten Husen and associates (1978:26) reported equivocal results in their review of the impact of teacher level of training on academic performance. Stephen P. Heyneman also reported that out of 24 studies in less industrialized societies like Nicaragua and Rwanda, 13 (54%) reported positive relationships of varying magnitudes while 9 (37%) reported no relationships and 2 (9%) reported negative relationships.

One can not rule out the effect of level of teacher training without investigating the impact of other moderator or intervening factors. Negative relationship may be explained by the influence of such factors as lack of experience, absence of hard work, motivation, etc., on the part of longer and better trained ones. Conversely, it could be explained by more and richer experience, hard work, and better motivation, etc., on the part of less qualified ones.

Negative relationship may also be explained by the absence of effort, interest, etc., on the part of students taught by more qualified teachers, and the presence of more effort hard work, interest, etc., on the part of students taught by the less qualified. In the former case, their various characteristics just like those mentioned tends to reduce levels. As to the latter, their effort, for example contributes to a rise in their achievement gains. The effort and experience of their less qualified teacher could also help them to stand up to the level of their counter parts who do not show up as much effort as is needed to achieve higher. No relationship may be explained by the failure on student parts regardless of the level of qualification of their teacher. Without investigating the influence of these factors, it is certainly difficult to neglect the impact of teacher qualification.

Marlaine E. Lockheed (1987:8), in contrast to the report of Heyneman, claims that in the list of school factors consistently predicting student achievement in developing countries, level of teacher education is one. Supporting this, Jamison and associates also suggest that levels of teacher education appear to be suprisingly robust as indicators of student achievement.

However, they have not stated what student attributes should be controlled to see unequivocal effects.

Jamison and associates (1981:557), however, have arrived at the conclusion that longer periods of teacher training are

not always associated with higher achievement levels. Fuller (1987) also states that many studies have asked about teachers' qualification in terms of their total length of schooling or the amount of their post secondary teacher training. Opposing these measures, he writes "Whether and how these proxies are related to the teacher's proficiency in organizing instruction and in motivating children remains very cloudy."¹⁹

Fuller, nevertheless, admits that, "yet, even rough measures of teacher quality are related to higher levels of student achievement."²⁰ He adds that achievement effects are more consistent for teachers' length of tertiary schooling. While summarizing his review, he writes "In total, 21 of 30 studies have found a significant association between teachers' level of general university or specific teachers training and the later achievement of their students."²¹

Supporting the foregoing discussion of Fuller, Strom stresses that "The more the length of the period of training, the better they are informed and the higher and the richer their intellectual background."²² This means that teachers who have passed through a longer period of training are more knowledgeable than those who lack this. It also indicates that they are more exposed to the subject-matter, and are capable of providing students with the sort of knowledge and experiences desired to achieve better and more as well. Yet, it does not indicate with what student and teacher characteristics teacher qualification interacts to bring about effective results.

Most of the studies reviewed have supported the thesis of this study. They have indicated that one of the factors attributable for future performance is the level of qualification of the teacher. As students taught by more qualified people are more likely to achieve better, their counter parts are more liable to attain lesser. It is this state of affairs that prompts an identification of the existence and the magnitude of the problem. Identification alone does not suffice. Some mechanisms should also be devised in order to alleviate the problem so that achievement could be raised to a certain desirable level.

Subscribing to the views of all who support a positive influence of some kind, this study has suggested that teachers' level of qualification has an important and direct influence in the determination of the future performance of trainees.

It is not only academic achievement and teacher qualification that determine future performance. The material conditions of a school, or school inputs also have a lot to do with facilitating learning and contributing to more achievement gains. It is to study the effects of one of the school inputs that attempts would be made to consider school library facilities.

4. Libraries and their Influence upon Future Performance

As the literature on the area of achievement (e.g. Fuller, 1987) indicates, one of the factors that account for variations

in performance is school facility. Fuller's and other similar studies have pointed to the conclusion that the presence or absence of pertinent school facilities in whose rank we find libraries contributes to the appearance of substantial differences in later day learner performance.

The elements that could be considered school facility tend to be numerous. Examples could be text - books, reading materials, desks, tables, instructional media like television, radio, video, library, laboratory, etc. Where these and other relevant facilities are found in optimum amounts and types, the students would be in a better position to know, understand, exploit, practise, and utilize what is available to their educational benefits. In schools where students do not enjoy these facilities, their exposure to more and deeper areas of academic study tends to be curtailed. With this, their achievement relative to those having access to better facilities would be lower.

In support of what has been explained, Marlaine E. Lockhead (1987) points out that students from schools with more resources - both material and human - out perform students from schools with fewer resources. Yet, he has not mentioned what factors should be controlled to find out these effects.

As contrasted with the foregoing view of Lockhead, there are other researchers who have not been able to find considerable school facility effects. One such a study comes from Fotheringham and Creal (1980) who argue that

In considering the quality of educational opportunity as a significant contributor to the differences in educational achievement among students, obvious differences appear among schools in the achievement of their students. But, when the differences in the initial level of achievement and family characteristics are controlled by comparing students with similar ability and background, no significant contribution to the differences in academic achievement is found among schools. Differences among schools had a negligible effect compared to initial achievement and family characteristics.²³

Initial achievement affects future performance. It has to be controlled to see much stronger effects. Schools and their facilities also influence achievement to a considerable degree. Two students who have similar ability and background but in schools having differences in facilities could not be expected to achieve to an equivalent degree. If one of them coming from a school with scarce resources achieves equally, then this similarity in achievement could be due to having other similar facilities (e.g. a library) at home, in the surrounding area, etc. It could also be due to the use of more effort to make up for the deficiency. One may also explain the equivalence in achievement by less effort as far as the one at an advantageous position is concerned. This one from a school with a better resource may not have exerted as much effort as is required to exploit the available resources in order to obtain achievement gains. Thus, it is not because it is only initial achievement that matters. Besides, it is not because schools have negligible effects. It is more likely to be attributed to failure to study and identify other

considerably significant factors. Hence, without controlling the possible effects of these factors, one could not be safe to exclusively or even partially underestimate the considerably high effects of school resources upon performance.

As Fuller (1987) has explained it, the apparent lack of effect of school resources is not because they do not have effects. But, it is owing to the effect of uncontrolled factors such as social class. To use his words "As several writers have pointed out, the general finding of small school effects on student learning may not be very accurate. Bowles and Levin (1968) and Mcpartland, Epstein, Karweit, and Slavin (1976) argue that school effects have been seriously underestimated because student background variables (i.e., social class) have been confounded with school differences."²⁴ What students lack in school may be found at home. Because of its availability at home, for example, their achievement may not be affected. Such a situation washes out the effect. But, it does not in any way indicate or imply that school resources have small effects.

Jamison and associates (1981) have described that "Evidence from the United States (Coleman et al, 1966; Jencks et al, 1972; Jencks et al, 1979) suggests that variation in the level of school inputs is not strongly associated with the levels of student achievement"²⁵ Although they have not mentioned why this happened to be the case, still it could be due to uncontrolled variables. But, they contend that a growing body of work from the developing world suggests that the situation

there is different, that is, differences in the level of school facilities have impacts. Thus, this could be because the effects of other variables may have been small or, as they have claimed, it may be due to the existence of a much higher variance in the quantity and quality of school inputs in low-income countries than in high-income ones.

The views of Mwamwenda and Mwamwenda (1987) appear to be concomitant to the later contention of Jumison and associates. In their study of school facilities as predictors of academic achievement, they summarize that "... the quality of education as reflected in achievement can not be divorced from school facilities such as classroom, furniture and reading materials."²⁶ Furthermore, according to them " Though some studies in the west have cast doubt on the importance of school facilities (Jencks et al., 1972) a substantial number of studies in the Third World and some Western countries have shown correlations between the availability of facilities and achievement (Saha, 1983; Johnstone and Jiycho, 1983; Cuttance, 1980; Heyneman, 1980).²⁷"

Whenever one thinks of desirable level of effectiveness in schools, one may not find it easy to think of that apart from the nature of the facilities they provide. This is because these facilities are among the variables that could facilitate effective learning. Perhaps, had it not been for what they contribute to enhance learning, there may not have existed the need to supply today's schools with increasingly larger and better facilities.

The effect of school facilities may appear small or insignificant. But, this is not because they are insignificant. It is highly likely to be due to the interference effect of some other equally important variables as Fuller and other writers have argued. Students from schools with little facilities (e.g. poorer libraries) may show more achievement levels. But, this may be due to their family background. They might have libraries in their own home. It is possible for their learning to be supported by the effort of educated members of their family. Thus, without eliminating the effects of such factors, it would really be difficult to take school facility effects as negligible. Moreover, it is not only the availability of facilities that is important. The rate of utilization also plays an equally important role.

One of the school inputs considered in this study is the school library. The library gives access to funded human knowledge and experience. Of course, what students obtain from classrooms could well be enriched, developed, and optimally exploited if there is a library with a wide variety of books and other relevant reading materials. As Heyneman (1980) advocates books have the capacity to deliver massive amounts of new information. Moreover, if the content is not understood, it can be studied again and again as far as it is in books. That seems why he concludes "... as an instrument for affecting learning they represent a reasonable choice."²⁸

Students in a school with a library that could be taken as good are mostly in a better position than those lacking

this as far as their achievement is concerned. According to Bruce Fuller (1987) a considerably large number of studies conducted to investigate the impact of libraries found out that libraries contributed much to student achievement. This was known by way of measuring the effect in terms of the size of the school library (Number of Volumes). To use his own words "A school library is another instructional resource which may significantly influence pupil achievement. Significant student performance effects have been found in 15 of 18 analyses."²⁹ He adds "other research indicates that the simple presence of a school library is related to the school's average achievement level in El Salvador, Botswana, and Uganda."³⁰

At last, the importance of libraries lies in that higher level of libraries tends to increase the depth and breadth of teaching and learning and, with this, increases the level of academic performance. Moreover, a number of studies investigated here have made it a point, in conformity with the thesis of this study, that school facilities among which we have libraries account for some degree of the variations in later - day performance. Thus, this study suggests that higher levels of libraries contribute to better future achievement.

Alongside prior academic achievement, teacher qualification, and libraries, future performance can be affected by differential academic exposure. The following discussion tries to consider this.

5. Differential Academic Exposure and its
Influence upon Future Performance

Academic background, in this study, is considered from the point of view of two versions. One is prior academic achievement. The other version is differential academic exposure. Differential academic exposure is still within the scope of prior academic achievement. But, for one of the purposes of this study, it is understood and taken in a somewhat different way as can be seen below.

Prior academic achievement is concerned about the impact of previous achievement level on a subject that has been pursued upto grade twelve upon performance in that same subject in the T.T.I. In this case, we investigate the influence of previous achievement of an individual from the Social Science stream, for example in Geography or History, upon his Geography or History performance in the T.T.I. Similarly, we investigate the effect of prior achievement of Natural Science students on the subjects they have taken up to grade twelve, for instance Chemistry or Physics, upon their performance on these same subjects in the T.T.I.

Differential academic exposure is related to the impact upon future performance of not taking a subject up to grade twelve, or taking a comparatively small amount of a subject (up to grade 10). It is about the effect of not pursuing a certain subject exhaustively through all secondary grades on performance on that same subject in the future and, in this

case, in the T.T.I. This is assessed in comparison to the achievement level in the T.T.I. of those who have studied the subject in all four grades in the secondary school. In this case, we examine the impact of not taking Geography upto grade twelve, or taking Geography only upto grade ten, for example, upon the future performance of a group from the Natural Science stream as compared to the performance of another group from the Social Science stream who has taken Geography upto grade twelve. In short, it is about differences in future performance between groups of trainees resulting from taking larger or smaller amount of a subject-matter, or from being in different streams of study in the secondary school.

The measures used to assess the impact of the two different versions are different. In the first case, we use absolute measures in that we assess the individual's prior achievement against his own performance on the subjects he has studied upto grade twelve. Thus, we employ measures of correlation. In the second case, we use relative measure in that we compare the achievement of a group on a subject not pursued upto grade twelve with (relative to) the performance of another group that has studied the subject upto grade twelve. To this effect, we employ one measure of central tendency (mean) and one measure of variability (standard deviation).

As has already been described, there are variations in the degree to which a subject is studied by students from different streams of study in the secondary school.

Owing to this, it may be expected that those who studied a subject more would tend to achieve better. Students may be said to have been exposed differentially when there exist differences in the areas of knowledge, skills and other related experiences to which they were exposed earlier. For example, two students taking a course in Geography could be taken as having been differentially exposed if one took Geography upto grade twelve or spent more amount of learning time in his high school class and the other did not.

As students come to schools to learn, they get exposed to a certain type of learning atmosphere. In this atmosphere of learning, they will be acquainted with different areas of study and their respective activities. Today, it seems that there is more tendency to recognize the existence of differences in interest, aspiration, motive, talent, etc., among learners. The development of behavioural psychology in this respect (Educational Psychology) and the Psychology of Learning at large have had worthwhile contribution to this recognition of differences.

Out of all the stimuli available in the climate of learning particularly in the form of subject-matter content and related learning experiences, students select and give their responses to those appealing to their various attributes such as interest. As they increase their exposure to these selected stimuli such as particular subjects of study, they are more likely to learn and achieve much more and better.

Implicit in this is that those students who continue learning a preferred specific area of study are more likely to show achievement gains as compared to those who have not opted to learn more, or have preferred to discontinue learning it. It is particularly in this connection that the question of the influence of differential exposure arises.

While some writers assume that discrepancy in the aforementioned version of academic background results in variations in future performance, others don't. One of those who propound the idea that differences in exposure give rise to disparity in performance is Hilda Taba (1962). As she points it out, every current experience is coloured by and so can build on the preceding ones. This tends to show us that what is performed today is in a way also a reflection of what one had in the past.

Tsai and Walberg studied the impact of more learning and attitude on performance. They found out that "... the more one learns, the higher the attitude; and the higher the attitude, the greater one learns. Improving attitude and encouraging greater learning are both important for long-term results."³¹ Although this is not directly related to differential exposure, it tends to show that more learning is a result of more and greater exposure in an area. And, later more performance springs from earlier more and greater exposure. If there are significant differences in the degree of exposure, there could also exist substantial disparities in the magnitude

of future performance. Seen from this perspective, their conclusion is a point that can be supported.

Ellen D. Gagne and associates (1986) studied the importance of familiarity (prior knowledge) on the acquisition and retention of information. They write that

Educators have long been aware of the importance of familiarity (meaningfulness, prior knowledge) for the acquisition and retention of information by students. If students hear or read about topics for which they have no prior knowledge, they have greater difficulty learning them, and also seem to forget faster what they do learn.³²

They also add that recent studies such as Chiesi, Spilich, and Voss (1979) have further demonstrated the importance of prior knowledge for learning. They have also emphasized on the particular importance of prior related knowledge by citing Ausubel (1968) who claimed that "... prior related knowledge provides an 'ideational scaffolding' for new information. This scaffolding presents information distinctly in memory for a longer time than would otherwise be the case."³³ What we can understand from this is that more familiar material enhances the effort made to learn new related information. Besides, we can see that the more one is familiar, the more one keeps information in memory which may be used to advantage at some later day.

David Sinha is also in support of the stance just mentioned. According to him

... how much schooling a student receives in different curricular subjects affects achievement differences between and within schools. According to Schmidt (1983), variation may be accounted for by two factors: available course offerings and student course selections. The central idea is apparent; more courses and time spent in a curricular area lead to greater achievement.³⁴

He also mentions the suggestion of Schmidt that "... quantity of schooling is a significant contributor to variation in academic achievement."³⁵ This clearly reveals that with an increase in the amount of subject-matter taken in a selected area of study, and the amount of time spent on a chosen area of study, there will also be a rise in performance.

The students streamed in the **Social Sciences** in secondary schools, for example, take Geography and History for two additional years. This means that they are more exposed to these areas. The quantity of their schooling is larger too. Thus, according to Schmidt, the contribution of this to better academic achievement on these areas is expectable. When viewed in this way Schmidt's suggestion seems acceptable. More exposure brings about higher prior knowledge. And, higher previous knowledge and experience are, in turn, highly likely to exert some kind of influence on what one accomplishes in the future.

The studies reviewed with the exception of that of Tsai and Walberg appear not to have acknowledged the fact that achievement is a function of several variables. Of course,

achievement is a function not only of differences in the amount of a course taken, but of very many other factors too. In general, they all have attempted to indicate the place of importance of differential academic exposure in the determination of the direction and magnitude of future performance.

Some researchers such as Mehrens (1987) argue that the impact of curricular differences upon performance is negligible. Yet, they support the idea that this issue of curricular differences should concern researchers, curriculum workers, and practitioners as well. To them, the curriculum is understood as being equivalent to the content of instruction. This resembles the view academic scholars hold about the curriculum. However, as viewed by the researcher, the curriculum is much more than the subject-matter and its content. As a plan for a programme in education, the curriculum constitutes objectives, learning experiences, and techniques of evaluation. Hence, curricular differences may not be reduced to differences only in the contents.

The assertion of those supporting 'Negligible Effects' is based on a certain assumption. This assumption is that the course of instruction that precedes the achievement test may have the effect of homogenizing students with respect to the necessary knowledge and skills required by the test. This is a point worth considering. According to them, it is not the background of students that affects future performance. Rather, it is the failure on the part of instruction to

homogenize student level of abilities necessary to cope up with the requirements of tests of achievement. But, this is questionable, as homogenization is better a means of reducing the effects of differences in prior exposure than a cause of the occurrence of differences.

According to them, it appears that differences in prior exposure would have effects if instruction failed to homogenize student differences. With this, while pointing to the means of reducing differences, the researchers in a way express their recognition of the existence of the impact of differences in prior exposure upon future performance. This is what we seek. And, it is one of the means we need to reduce the differences. If instruction fails to homogenize student abilities, then, prior exposure would have effects.

Although failure to homogenize could be another cause, in this context, it is rather a means of reducing the effects. There is that possibility for instruction to cause differences although not in the context of the proponents of "Little Effects". It can be argued that, in general, it is both a cause of differences and a means of reducing effects.

The advocates of 'Negligible Effects', however, admit that variations in performance will actually occur if curricular differences are considerably larger to give rise to that. To cite a case

If curricular differences are great enough to cause the test to measure the exposure to specific types of instruction as well as students' ability in the content area being tested, then one would expect linear factor analysis to identify at least two dominant factors, one related to the content, and the other to instruction (items that were taught or not taught).³⁶

According to them, we could find differences in performance between students with differential academic exposure if

- Students' ability in the content area being tested shows considerable variation

- there are substantial differences in the amount of items that were learnt while being in secondary schools.

In accordance with their view, trainee background can have an effect if differences in previous ability, content, and, types of instruction are considerably larger. It can also influence future performance if later day instruction fails to homogenize, or do away with variations in abilities. This implies that it is in the absence of the above conditions that differences in exposure will have an impact. However, it can be contended that failure to homogenize student abilities could have more effect if the problem was more related to problems of instruction at the high school level. It could probably wash out or reduce the effects if the problem was more of instructional. On the other hand, their argument can not be totally ruled out. This is because to

attribute the effects to prior exposure, there have to exist considerable differences in later day test scores and substantial differences in the amount of items that were previously learnt. But, as they seemed to have admitted it, whatever we may do to wash out the effects, there still remains what they phrased 'Negligible Effect'. They have also concluded that the impact of factors that might be related to curricular differences is minor. However, whatever the degree of the impact may be what is important in this connection is the very existence of the influence to an extent that can distinctly show differences in performance attributable to differences in exposure to particular areas of study.

Contrary to the afore-mentioned view of Philips and Mehrens, Alexander and Judy claim that "Research in cognitive psychology during the past two decades has produced two undisputed findings about academic performance. First, those who know more about a particular domain generally understand and remember better than do those with only limited background knowledge."³⁷

It can then be argued that differences in magnitude of exposure to the same area of content affect future level of performance in some ways and to some recognizable degrees. Moreover, just like prior academic achievement, differential academic exposure, as part and parcel of trainee academic background, is highly likely to influence future level of performance. The literature reviewed more or less supports

the thesis. On the basis of the analysis so far made, then it is suggested that variations in exposure to the same area of content would generate differences in later performance.

Differences in academic background, teacher qualification, library facility would have impacts upon future achievement. And, these impacts are expected to have some kind of curricular implications. And, these will be considered in the following pages.

6. Implications of Evaluating Performance to the Curriculum Development Process

Why should we measure performance ? What is the need for correlating results of students? To start with, it is apparent that in most cases measuring performance and correlating achievement are not done without any purpose in mind. Such a task has very many useful implications particularly to the process of curriculum development as far as this study is concerned.

The task helps, above all else, to know the degree of achievement of trainees in this context. As Tyler has put it "It should be clear that evaluation then becomes a process for finding out how far the learning experiences as developed and organized are actually producing the desired results ..."³⁸ Moreover, the task helps to identify if there are problems of attaining an optimum level of achievement. Identifying these difficulties, in turn, leads to examine where in reality the

area and the source of the problem are. And, it is with this identification and examination that we could have a strong empirical ground for basing remedial action as the case may be.

One possible area or source of problem is the curriculum. Evaluating performance contributes to know if there are problems of achievement and, on this basis, to further study and determine if these problems are related to the curriculum development process. This is also what furnishes the evidence essential for improvement. As Tyler (1949) has explained, the information obtained from the results of evaluation is necessary to identify strength and weakness in the curriculum. It is this that could help to indicate where the curriculum may be in need of improvement. To use his words, "As a result of evaluation it is possible to note in what respects the curriculum is effective and in what respects it needs improvement."³⁹ This is the way instructional evaluation contributes to the evaluation of the curriculum. If the evaluation of Geography achievement in the T.T.I., for example, shows lower levels of performance, this information could be used and lead to assess if there was lack of needs assessment, or if objectives were beyond the level of trainees, or if the learning experiences were not appropriate enough to precipitate the desired level of results.

As Thorndyke indicates, systematic evaluation of outcomes is essential to bring about changes in curricular emphasis

among other things. The following words of his are evidence to this point of view:

In education there is a steady flow of proposals for change - change in curricular emphasis, change in instructional materials, change in instructional procedures. If innovations are to be introduced rationally rather than capriciously, and if education is to show any cumulative progress in effectiveness rather than an oscillation from one fad to another, systematic evaluation of the outcomes from any change is imperative.⁴⁰

Based on the view of Thorndyke, one can argue that programme effectiveness requires the employment of systematic procedures be it at its inception or development. This being the case, unless the curriculum is prepared using systematic and relevant procedures, it may be difficult for it, as a plan, to lead to programme effectiveness in education and training. If it is not based upon the assessment of trainee common needs, for instance, it may under - reach or over - reach these needs. Both under - reaching or over - reaching may not be expected to result in the attainment of desired and desirable goals. That is why it is necessary to employ a certain expedient system of doing things in any kind of programme for that matter.

According to Taba (1962) the curriculum development process involves five major steps all of which are interrelated. The first step is needs assessment. This is what we do before we embark upon the actual process of planning. One of the

components, or sources of curriculum planning is the learner. Learners deserve to be source by the fact that they are at the receiving end of the curriculum. Including them is good for a better success than without them. These needs could be identified using research, observation, testing, previous records, etc.

Analysis of trainees needs necessitates investigating their ability, prior experience, and magnitude of exposure among many others. Whether or not curriculum planning has been considerate to them could well be detected by the results derived from performance measures. And the problems related to these attributes of trainees, if there are any, as detected with the help of devices of evaluation could provide the information and data essential to locate where there are inconsistencies in the curriculum, and to suggest possible areas of improvement.

To find differences in the performance of trainees from Social Science and Natural Science background helps to identify their needs. Besides, it also helps to determine whether or not these needs have been appropriately assessed prior to planning. Tyler has contributed to this idea by stating that "It is not only valuable to know about students' background but also to know about their achievement of various kinds of objectives in order to have a better notion of both their ^{needs and} capabilities."⁴¹ Possessing a better notion of their needs helps to determine whether these needs have been taken into consideration during the planning process or not.

The second step is the identification and formulation of objectives. In relation to this, evaluating and detecting problems of achievement contributes to the effort made to appraise the effectiveness of the objectives stated by the curriculum. It is on these grounds that one can recommend the need to identify appropriate and attainable objectives during designing the curriculum. As Taba (1962) points it out, the information obtained from performance measures is frequently used to assess if the curriculum developer has established optimum standards of attainment and to suggest modifications, emphases, changes, etc. To use her words

This is especially so with the results of achievement tests, as in the comparison of group scores and national norms on an arithmetic test to decide whether or not a greater emphasis in arithmetic is needed to bring achievement upto the expected norm.⁴²

As has already been explained, the data can be used to locate the causes of weakness and strength in the attainment of students. If the weakness are related to the nature and level of objectives of the curriculum, then, it will be possible to forward the need to re-plan objectives if situations make this imperative. Tyler also points out that "Increasingly, we must expect to use evaluation procedures to determine what changes are actually taking place in students and where we are achieving our curricular objectives and where we must make still further modifications in order to get an effective educational program."⁴³

What comes following the identification of objectives is the selection of contents and learning experiences. Knowing the level of achievement helps to design better curriculum materials such as text-books and teacher guides. As Thorndyke indicates "one purpose for which measures of achievement are needed is for the evaluation of alternative curriculum materials..."⁴⁴ As Salmon Cox (1981) also shows the information can be used to re-shape instructional contents by "... adding or deleting material, shifting emphases, or increasing instructional time in particular areas."⁴⁵ The data could also show the direction for selecting proper activities.

Previous achievement and degree of exposure are among those which can influence the selection of initial contents and learning experiences which ought to be directed at the learner's existing state of readiness. Evaluation of performance is one of the mechanisms we employ to see whether the curriculum planner has incorporated information about the afore-mentioned attributes or not. It is on the basis of this information that we could indicate that there are areas of content and activities where revision may be in order.

The fourth step is the organisation of the selected contents and learning experiences. Taba (1962) under lines that curriculum content should be learnable and adaptable to student experience. This means that it should be arranged and put in such an orderly manner that can contribute to better learning and higher level of performance. It also indicates

that psychological threads of organisation such as those which take account of previous level of achievement should be used to bring about effective cumulative learning and performance. Implicit in it is the idea that poor performance could have its cause in the lack of effective system of organisation. Sometimes students might perform poorly because contents have not been organised from the simple to the complex, lower to the higher, etc. Lack of this sort of order might lead to failure to reach mastery, which, in turn, is prone to lead to poor performance.

As Taba explains, one reason for failure is failure to take this question of organisation into serious account. As to her, for effective learning and better performance, the abilities and experiences of the learner must be considered not only in selecting contents but in organizing too. Knowing which concepts have been mastered, and the level of understanding attained is instrumental in the decision at which points to start in any particular grade (level), subject, or unit. This view of hers seems acceptable. One will probably find it difficult to proceed smoothly in his teaching of the process of mountain formation (orogenesis) with trainees who have not had rudimentary knowledge on what mountains are and types such as faulted, folded, etc. Advanced concepts in landform Geography like this one may not be well understood without preliminary and fundamental ideas about what mountains are and their classification too. In most cases, for beginning trainees, it appears preferable to proceed in one's arrangement

from the types of mountains to the processes involved in their formation. The otherwise is apt to create difficulty in understanding and, therefore, may lead to poor performance.

According to Taba, knowing that a certain group has had little experience with any given subject would indicate what preparation is needed and how the work should be organised. Results of performance furnish information which may be used to assess if there are problems with organization, and which may indicate the direction for employing a better technique of organization. Further, on the information about weakness and strengths of trainees depend decisions regarding what content is appropriate and the level on which this content needs to be organized and treated. It also affects decisions related to what particular materials and learning experiences to use and how they should be arranged for further effectiveness.

Taba also emphasises that without information on the achievement of learners, the curriculum can either over-reach or under reach students and teach what they already know and grasped or anticipate what is impossible for them. Thus, one can argue, if no information is available with regard to the levels of prior achievement of trainees, their curriculum is susceptible to be weak, for example, in principles of curriculum organisation: Continuity, sequence, and integration. And, this weakness in the curriculum as regards principles of organisation may lead to poor performance. Performance

measures, thus, provide us the information we seek to attribute the problem to failure at this step of curriculum development as the case may be.

At last comes evaluation as an integral part of the curriculum development process. This step suggests tools and mechanisms to be employed in assessing performance at the level of instruction. In this case, the feedback information obtained from poorer or better performance at the T.T.I. level, for example, could be used to appraise the appropriateness and effectiveness of the devices and techniques of evaluation suggested by the curriculum. It is possible for poor performance to appear owing to employing ineffective and inappropriate tools and techniques of evaluation. The information we secure from investigating levels of performance in the T.T.I. could be helpful to assess the devices in the light of their effectiveness to work as intended.

In general, identifying the level of performance in the T.T.I. provides basic and essential information for a wide variety of curricular decisions. The curriculum, as a plan, has been prepared for trainees to learn. Performance measures are useful to determine the degree of effectiveness of the curriculum with the trainees for whom it has been prepared.

In concrete terms, the results of performance measures help to investigate if the curriculum has incorporated general background information concerning the level and range of

abilities of trainees we have trained. Besides, these results render help important to bridge the gap between the knowledge we have about the general needs of trainees and the particular needs of a definite group. This has implications to the curriculum. A curriculum development process which does not use information from these sources would be far away from identifying important trainee needs be they are general or particular. If these needs are not identified, the curriculum may not be able to suggest measures useful to meet these unmet needs. Where these measures are not at work, effectiveness would be endangered.

Regarding the contribution of such information to the evaluation of curricular objectives, Taba has to say this:

When such information is available on a wide range of objectives, it is also possible to determine whether the achievement of students in all educational objectives is balanced or whether it is systematically high in some respects and shows equally systematic weakness in others.⁴⁶

To know such distinctions in the level of performance, besides the idea of Taba, is considerably important for providing suggestions useful to gear the curriculum to an appropriate degree of depth and breadth. It is also useful to determine and suggest the level of concepts, values, and skills required to succeed in training. Furthermore, it is essential in determining the causes of failure and success. It is on these bases that the curriculum development process

can locate points that need particular attention, select and organize the most important curriculum elements for use in training for purposes of making the curriculum much more effective.

The information we get about performance, according to Taba, is especially significant in gauging the amount and distance of transfer which learning has produced. To her, this is a problem which is at the heart of effective curriculum. Tyler also advances the view that evaluation procedures can be used as a basis for identifying particular points needing further attention with particular groups of students. He adds that information collected from these procedures can also be used as a stepping stone for providing individual help, or planning individual programmes for students in the light of their particular progress in the educational programme.

Salmon Cox carries the view further and claims "Achievement test information also plays a role in grouping and tracking students.." ⁴⁷ Besides as Thorndyke advocates

General level of achievement is significant in a decision of how high to plan to aim in the educational scheme of things, and relative achievement in different fields can be a factor in the decision as to what specialization to pursue at a given level. ⁴⁸

Indeed, the information in all its aspects is very relevant to the curriculum development process. It should capitalize on this information in order to suggest what have so far been

mentioned as advantages that could be accrued from evaluation procedures. Short of this, it may not be effective in guiding instruction and facilitating the achievement of objectives to the intended and desirable level. The persistence of the problem of poor performance may imply that the curriculum development process has not used the feedback in order to improve the curriculum from time to time.

One can say, then, the results of performance help to evaluate and re-shape the curriculum. As to Gronlund (1976: 12), this evaluation of the curriculum itself also plays an important role in curriculum development. As Salmon Cox adds it "... tests serve to shape curricula or instruction."⁴⁹ This is by way of showing strength and weakness in the achievement of students.

The results of performance measures would throw light on what one does to assess whether the curriculum development process has followed the steps that should be considered, that is, they imply something. It is in these implications we are interested in. We evaluate performance as a stepping stone to evaluate the curriculum development process.

As a whole, the reviews made here, in line with the basic assumption of this study, have suggested that academic background and other related factors have impacts upon future performance. They have also indicated that results obtained from measuring performance could contribute to what could be

done to assess the strength and weakness in the curriculum development process, and to suggest appropriate measures accordingly.

One can remark that most of the preceeding studies reviewed in this chapter have helped to forward a theoretical suggestion that prior academic achievement, level of teacher qualification, level of library facility, and differential academic exposure have had impacts upon trainee performance. With this, they support the theses of this study. It is then, on the basis of this theoretical consideration that attempts shall be made to investigate if these variables have impacts in practice. The following chapter throws light to this.

CHAPTER IV

ANALYSIS AND INTERPRETATION OF DATA

This part of the study tries to integrate the theoretical discussion in chapter three with the research findings. To this effect the data collected are first presented, and then analyzed and interpreted. This task is approached in the following ways:

a. Basic Statistics:- These include such descriptive values as the mean, standard deviation, maximum and minimum scores for the three independent variables and the dependent variable. These scores are first presented primarily to show the general nature of the data obtained. They also serve to provide general information which could be used to further explain findings in conjunction with the results of correlation and regression.

b. Intra-predictor, Intra-criterion, and Inter-predictor-criterion correlation matrices:- These are presented second. The results from these matrices shall be used to explain the direction and magnitude of relationships between and among the variables included in the study. This task also lays the ground for the next step of regression analysis which will be used to show the relative contribution of all potential predictors.

c. Comparison:- This is presented third. At this step we compare the T.T.I. performance of students from the Social Science and Natural Science streams of study in the Secondary

school. This is to investigate the effect of differential academic exposure.

1. Basic Statistics

Herein are presented tables 6 and 7 which show basic examination statistics, and table 8 indicating statistics for levels of teacher qualification and library facility.

Table 6: Mean, Standard Deviation, Maximum and Minimum Values on Examination in Secondary School Subjects (x_1)

Subjects	Mean	Standard Deviation	Maximum	Minimum
Amharic	60.8	7.6	86	44
English	60.8	9.0	86	42
Maths	58.4	9.3	79	32
Biology	62.4	9.5	85	41
Chemistry	59.6	8.9	81	39
Physics	61.1	8.3	83	47
Geography	67.9	7.9	82	54
History	69.6	8.1	89	53

The raw values from which the above statistics are calculated are average scores derived from the marks trainees obtained in all their secondary grades.

The expected mean value for all subjects (x_1 's) is a score of 50. In this sample, it is observed that the mean

in each subject area is to a certain extent above the expected mean value.

When it comes to standard deviation value, one can see that all subjects have a standard deviation value which is different from 0. This indicates the fact that sample means can naturally be different from what is expected to be. Put differently, because of the existence of differences between the observed values and the expected mean value, these same observed mean scores will attain standard deviation values that are different from the expected (0).

As the figures in the table clearly indicate, the observed maximum scores are below the expected maximum value (100). The observed minimum values in all subjects are above the expected minimum values (0).

In general, the mean achievement in secondary school subjects tends to be far below the expected maximum score. Hence, when reference is made to this maximum score, it shows that the previous level of academic achievement of trainees is considerably low. This finding appears to be consistent with ERGESE's report (1986:15).

Table 7: Mean, Standard Deviation,
Maximum, and Minimum Values on Examinations in
T.T.I. Subjects (Y₁)

Subjects	Mean	Standard Deviation	Maximum	Minimum
Amharic	6.8	1.7	9	3
English	6.4	2.1	9	3
Maths	5.7	2.3	9	0
Biology	7.2	2.2	12	3
Chemistry	7.2	2.0	8	0
Physics	5.0	1.8	8	2
Geography	7.4	2.1	9	3
History	7.2	1.8	9	3

Due to variations in credit hours given for the subjects in the T.T.I., the expected mean values are different. The expected mean value for those given two credits (Chemistry and Physics) is 4. The remaining subjects' expected mean value is 6. With this, one can see that the observed mean values for all except Maths are somewhat above the expected mean scores. This shows that most criterion variables' values are in a direct relation to the predictor variables' values. In general, they follow similar tendencies in the direction of increase in values. Maths results are lower than the rest in both predictor and criterion values. We can, then, see that, at the subject level, the data show that previous academic achievement is directly related to future performance.

The presence of values different from 0 makes standard deviations values appear not to have been as expected.

The maximum values are below the expected with the exception of Biology, Chemistry, and Physics. The minimum values are above the expected apart from Maths and Chemistry.

In general, mean performance in most T.T.I. subjects tends to be far below the expected maximum score. With reference to this score, one can say, that the performance of trainees in the T.T.I. is significantly low.

As can be seen from the two tables above, the direction of relationship is determined in one and the same subject at the two levels of education. However, the degree of this relationship is not yet known. Besides, there is no way to know how these predictor variables (x_1 's) are interrelated. Also, it is difficult to examine the interrelationship between criterion variables (y_1 's). Further, it is difficult to determine how predictor variables representing previous achievement (x_1 's) are related to the other independent variables, that is, x_2 and x_3 . Although the first hypothesis appears to have been partially (direction) supported, it is difficult to proceed to discussions since, at this point, the effect of the remaining two independent variables has not been determined and the degree has not been known.

The discussions will follow after complete results are obtained from the intercorrelation matrices. Thus, how the

predictor variables (x_1 's) are interrelated with each other and the remaining predictor variables (x_2 and x_3) as well as with dependent variables (y_1 's) is shown on tables 9, 10, and 11. Before this, we treat basic statistics for x_2 and x_3 .

Table 8: Mean, Standard Deviation, Maximum and Minimum values for figures representing Teacher Qualification and Library Facility

Variables	Mean	Standard Deviation	Maximum	Minimum
Teacher Qualification	.93	.88	2	0
Library Facility	1.2	.72	2	0

Note that the expected mean value for both variables is 1. The observed mean value for figures representing teacher qualification is below the expected indicating that the average level of teacher qualification is slightly lower. Hence, with positive or direct relationship, we expect that this would give rise to low results in the majority of cases. When it comes to the library, the observed mean value for figures representing volumes of books is slightly higher than the expected. If this has an impact, we expect a rise in performance with most trainees.

For both variables, the existence of variations in the

samples' observed mean values brings about standard deviation values different from what is expected to be. The maximum and minimum values are as expected, that is 2 and 0 respectively.

The figures on table 8 do not show the results of the interaction (findings) between the variables indicated and T.T.I. performance. Thus, since they do not provide data useful to support or reject the hypotheses, they will not also give the basis for discussion. That is why, with the above description in values, we shall proceed to see the inter- and intra-variable correlates available in the intercorrelation matrices. These matrices show the results (findings) that is, the direction and degree of relationships between and among the variables. It is this that lays the ground for interpretation and discussion.

The level of significance chosen for this study was .05. Hence, correlation coefficients which are greater or equal to this figure are taken as statistically significant.

Table 9: Intra - Predictor, Intra - Criterion, and Inter Predictor - Criterion Correlation

	X11	X12	X13	X14	X2	X3	Y11	Y12	Y13
X12	.6070*								
X13	.6231*	.5605*							
X14	.5772*	.5915*	.6132*						
X2	.0385	.0822	.0664	.1720					
X3	-.1241	-.0968	-.1565	-.3034*	-.1018				
Y11	.5357*	.5371*	.5389*	.5387*	.0155	-.1800*			
Y12	.6336*	.5883*	.6153*	.5795*	.1912*	-.1493	.5195*		
Y13	.6072*	.5326*	.5089*	.5451*	.0849	.1249	.4391*	.5859*	
Y14	.5359*	.6062*	.5837*	.6297*	.1697	-.2142*	.5868*	.5691*	.4558*

N = 132

*P < .05

Table 10: Intra- Predictor, Intra - Criterion, and Inter Predictor - Criterion Correlation

	X15	X16	X2	X3	Y15
X16	.6654*				
X2	.1096	.1398			
X3	-.0798	.0789	-.2569		
Y15	.6212*	.6170*	.1645	.0070	
Y16	.5428*	.6557*	.1491	-.1035	.7356*

N = 98

* P < .05

Table 11: Intra - Predictor, Intra - Criterion, and Inter Predictor - Criterion Correlation

	X17	X18	X2	X3	Y17
X18	.5049*				
X2	.0099	-.0869			
X3	-.3747	-.4050	.3768		
Y17	.4524*	.4307*	.1233	-.0390	
Y18	.5789*	.4229*	.2634	-.0070	.4698*

N = 34

*P < .05

2. Results (findings) of the interaction between
Predictor and Criterion Variables and Discussion

In this part are presented and discussed the findings obtained from the inter - correlation matrices in the main. This is as regards the interaction between the three independent variables and the dependent variable. Results in the tables showing basic statistics are also used to explain findings where they are found relevant. For reasons of convenience, each relationship is considered independently as follows:

2.1. Relationship between Achievement in Secondary
School Subjects (x_1 's)

There appear to exist positive relationships between predictor variables representing trainee previous academic achievement in secondary schools ($x_{11} - x_{18}$). Although the magnitude does not seem very strong (the highest $r = .66$), there is an overall tendency for a considerably strong relationship. This tends to show that achievement in one subject is positively related to achievement in another subject.

2.2. Relationship between Achievement in Secondary
School Subjects (x_1 's) and Teacher Qualification(x_2)

We can observe from the available evidence (tables 9, 10 11) that predictor variable representing teacher qualification

is not significantly correlated with secondary school results. The existence of considerable deviation in teacher level of qualification (see table 8) has not been able to give rise to the presence of relationships in the way they were expected, that is, higher degrees of relationship with more years of tertiary training of teachers and vice versa.

Longer periods of tertiary training may not necessarily mean effective teaching essential, as a contributor, to more effective learning. However, implicit in it is that the possibility of effectiveness shall be higher with an increase in the number of years of training. Thus positive relationship implies that there is effective teaching that can contribute to gains in the level of achievement. On the contrary, absence of substantial relationship may mean that effectiveness could not be attained due to a wide variety of teacher and learner characteristics (variables). Some of the literature have also suggested the need to control them.

One may argue that it is not only a longer period of training that ensures success although it is considerably indispensable. Besides training, to be effective, teachers need to have a good magnitude of experiences in teaching. They should also be much more motivated so that they can influence student learning and achievement by effective teaching. In addition to possessing experience, a favourable attitude, interest, etc., they ought to spend increasingly

less time in futile, trivial, and non-academic activities. Lack of the attributes mentioned and failure to accomplish what is expected of them and other important activities are prone to lead to a lack of effectiveness and eventually to the absence of any significant relationships. Teachers may lack effectiveness not because they are trained for a more number of years or are better qualified. Lack of relationship may be explained by the effect of many unstudied teacher variables such as insufficient experience, lack of interest, effort, and many other uncontrolled variables. In any case, it warrants further research.

2.3. Relationship between Achievement in Secondary School Subjects (x_1 's) and Library Facility (x_3)

The third predictor variable could not show significant relationships with secondary school results except with those of Biology (x_{14}). Yet, this relationship in Biology is in an unexpected negative direction. The existence of considerable deviation in the volume of books available in the schools studied (table 8) has not been able to contribute to differences in achievement.

Sheer presence of larger volumes of books in a library may not necessarily mean making an effective use of what is available to one's advantage. Nevertheless, implicit in it is that with an increase in the size of volumes of books,

there would be more possibility to get access into numerous and perhaps more diversified volumes, and, with it, higher probability to profitably use such a resource. Hence, positive relationships may imply that books are effectively used to student achievement benefits. Contrary to this, the absence of any significant relationship may indicate that there is failure to use, or are shortcomings to effective use that might possibly be attributed to lack of access, space, chairs and tables etc., for accommodation and the like. This may also be explained by an insufficient use students make of them or by the availability in greater number of books that may not have been relevant to student learning.

Library facility has shown significant negative relationship with Biology ($r = -.30$). This indicates that those from better libraries such as Medhani~~a~~lem (table 4) have not been able to get achievement gains due probably to the above stated or other unstudied and unidentified factors. Students from Dire Dawa, for example, have not been able to achieve higher not because there are many books in their library. Books will have an effect upon achievement when, besides their presence, there is an effective utilization of them. Thus, where is failure to use them, we could not expect gains in achievement attributable to the effect of books. As a result, it is not the presence of books that has brought about less effect. Rather, it could be the absence of an effective use that should be made of among many others. As contrasted with this, those from poorer libraries such as Gelemso have been

able to get an advantage over their counter parts. This may be due to what they accomplished by way of making the maximum use of what little was available in their libraries. This may also be due to using other resources apart from the school library. This is because using one's personal collections, or steady borrowing from others who are in possession of relevant books could add and well compensate for what students could not get from the school library; yet, it necessitates further investigation since it has not been considered in this study.

2.4. Relationship between Teacher Qualification (x_2) and Library Facility (x_3)

The inter-correlational matrices have not been able to show that the predictor variables pertaining to teacher qualification and library facilities have any statistically significant relationships between themselves. Although this has not been treated in this study, lack of relationship may mean that the two could not be used simultaneously to measure one and the same thing.

2.5. Relationship between results on Examinations in Secondary School Subjects (x_1 's) and Performance in the T.T.I. (y_1 's)

There is a positive relationship between predictor variables representing previous academic achievement and

criterion variables which represent performance in the T.T.I. This finding is consistent with the direction of relationship observed in tables 6 and 7. Although the degree (magnitude) of relationship does not appear very strong (the highest $r = .63$), there is a tendency for considerable relationship showing that previous academic achievement is a significant predictor of future academic work.

The above finding is also consistent with many of the findings observed in the literature reviewed. Other researchers also have support to such a finding. As Parkerson writes "The educational process obviously involves more than one or two factors. Prior theory and research synthesis suggest that academic achievement, attitudes and behaviour are influenced by student motivation and ability (or its proxy, prior achievement)..."⁵⁰ Although motivation is not the concern here, Parkerson's suggestion supports the thesis.

The study of Letteri (1984) further suggests that a cognitive profile can account for as high as 87% of the variance in test scores and predict these scores at a level of .05 or better. In support of this, Tenenbaun claims that "studies have consistently demonstrated high positive correlations between cognitive entry behaviours (CBE) such as general intelligence and school achievement."⁵¹ All these indicate that a trainee's previous achievement affects his future performance in the positive direction and at statistically significant levels.

It can then be said that all predictor variables representing academic achievement in secondary schools have shown significant degrees of positive relationship with performance in the T.T.I. Here in this study, they predict that at .05 level of significance or better (Tables 9, 10, and 11). Hence the research hypothesis predicting a direct and significant relationship between the two variables (x_1 's and y_1 's) is supported.

2.6. Relationship between Teacher Qualification
(x_2) and Performance in the T.T.I. (y_1 's)

Teacher qualification has failed to predict academic performance in all subjects except in English (y_{12}). How has this variable, which has failed to have any significant relationship with student achievement in secondary schools, come to predict performance in the T.T.I.?

Whatever the degree of qualification of the teacher may be his role is one of facilitating student learning. It needs to be recalled that learning is exclusively the task of the learner. Hence, the failure for this predictor to signify direct and important relationships with achievement at the secondary school level may have been due to failure on student parts to use their teacher as a resource person in connection with English particularly. Thus, student factors that might have failed to bring about that relationship, or that might have lowered the significance such as effort, motivation, interest, etc., may have been raised as a result of the

presence of optimal conditions for them to work in the T.T.I. Their presence or increase in the T.T.I, may have raised the contribution of what little influence there existed in the high school to a level that could make teacher level of qualification predict performance in the T.T.I. Yet, it needs further considerations to be established as a causal factor.

It is only in English that predictor variable representing teacher qualification predicted future level of performance to a significant degree, and became consistent with the hypothesis of this study, that is, teacher qualification directly affects future performance. In the remaining criterion variables, this predictor variable which did not have any significant relationships with trainee prior achievement at the secondary school level and did not contribute to achievement at that level has not still predicted future performance in the T.T.I. Such an outcome may be due to lack of effort, motivation, enthusiasm, etc., on both student and teacher parts. Anyway, the findings, in general, answer the research questions raised in the negative. Thus, because the overwhelming evidence is in favour of no prediction, it can be deduced that the research hypothesis of this study is not substantially supported.

There are, infact, students in the literature reviewed which have also rejected the hypothesis though they are not in line with the thesis of this study. This does not, however,

in any way imply this factor is not important as a predictor as they have suggested. It may have failed to predict because of the possible interference effect of some other unidentified and unstudied factors such as those mentioned earlier. What is more, there is still some limitation on the nature of data collected in this respect. Hence, though this finding to some extent casts doubt on the literature supporting such a relationship, it can not totally rule out what is in the literature. Therefore, the fact that this has not been supported could not immediately lead us to conclude that the variable does not affect future performance. Rather, it points to the need to isolate the effects of other important moderator variables as has already been indicated in the literature.

The failure to predict does not necessarily indicate that the literature reviewed or the empirical studies conducted are exclusively unreliable and invalid. On the contrary, it points to the need to control or study the effect of some other relevant factors since performance is a multiple function of several variables as explained in the literature. Moreover, the presence of some prediction tends to indicate that we can not exclusively leave out the arguments presented for. As a result, we still need to study the variable in conjunction with other pertinent ones such as experience or control them so that the effect could be signled out. Since these are not controlled in this study, still, their effect may have led, one could say, to the

causal factor. As a whole, one may safely say that effort, the presence of a better library in the T.T.I. may have contributed to the reversal of effects, and to raise the interaction effects so as to make the variable predict significant negative outcomes.

In Biology, the prediction is negative as in the relationship. The effort, interest, motivation, etc. which could have contributed to the better achievement in the secondary school of those from poorer libraries might have been sustained and enhanced by a better library in the T.T.I. to precipitate the observed effects. Their counter parts may have still been far from making an effective use of the resources at their disposal.

It is only in Amharic and Biology that predictor variable representing school libraries predicted future level of performance to a significant degree and in a negative direction. The significance in the magnitude of predictability makes it consistent with the hypothesis while the direction makes it inconsistent with the hypothesis of this study, that is, library facility affects future performance significantly and positively. In the remaining cases (criterion variables), the predominant evidence is in support of no significant relationship. In the light of this, it can be said that the research hypothesis predicting a positive relationship between library facility and future performance is not substantially supported. Thus, it is rejected. The fact that in the

majority of cases the predictor has failed throws doubt on the arguments presented in the literature. On the other hand, the presence of some prediction indicates that we can not totally rule out the arguments. That is why we see the need to study the variable in conjunction with other pertinent variables such as rate of utilization, or control the moderator variables so that its effect could be singled out.

2.8. Relationship between Performance levels on the Subjects in the T.T.I. (y_1 's)

There is a positive relationship among the criterion variables representing trainee performance in the T.T.I. ($y_{11} - y_{18}$).

In general, findings show that with the exception of those of prior academic achievement (x_1 's), most of the estimated interaction coefficients of the remaining two predictor variables (x_2 and x_3) on the criterion variables (y_1 's) were very small and did not approach the already determined and expected level of significance (.05).

At last, since it is only in y_{11} , y_{12} , and y_{14} that more than one variable have been found to be significant predictors, it is necessary to see the relative importance and the order of their predictability by using them simultaneously. The following regression analyses present a further investigation of the contribution made by each of the predictor variables.

2.9. Regression Analysis

In an effort made to find out the degree of the interaction effect of library facility, teacher qualification, and individual ability (which is thought to be enhanced by the two factors just mentioned) on T.T.I. performance, and, with this, to find out the relative and independent contribution of each of the independent variables to the dependent variables, multiple regression analyses were run on x_{11} , x_{12} , and x_{14} . This is presented as follows:

Regression analysis on criterion variable Y_{11}

Regression equation

$$Y_{11} = .1172 x_{11} + -.0321 x_2 + -.2787 x_3 + -5.4542$$

$$t_c = 128 t .05 = \pm 1.96^*$$

$$R_{Y_{11}} \text{ (multiple R)} \cdot x_{11}, x_2, x_3 = .54806$$

$$R^2_{Y_{11}} \text{ (R square)} \cdot x_{11}, x_2, x_3 = .30037$$

About 30% of GPA variance in Amharic score (Y_{11}) at the T.T.I. is explained by the combined effect of Amharic score, Teacher Qualification, and Library Facility in the high school. This is a significant prediction ($F(3,128) = 18.32, P < .05$).

Since multiple R square is significant, then it will be necessary to find out the relative importance of each of the independent variables. To this end, we shall try to investigate the results of the Beta test.

*Note that t_c is t critical for accepting or rejecting t_o (t_o observed).

Table 12: Results of the Beta Test on Y_{11}

	x_{11}	x_2	x_3
B	. 117	-.032	-.278
SEB	. 017	.145	-.178
t_{0B}	6.88*	-.2	1.5*

* $P < .05$

As can be seen from the above figures, x_{11} ($t = 6.88$, $P < .05$) is the most significant contributor in terms of predicting y_{11} , that is, performance in Amharic at the T.T.I. It accounted for about 21% of the variance that is accounted for by the combined effect (30%).

What comes next is Y_{12} (Achievement in English at the T.T.I.)

Regression equation

$$Y_{12} = .1331x_{12} + .3245x_2 + -.2344x_3 + -1.7340$$

$$R_{Y_{12} \cdot x_{12}, x_2, x_3} = .61070$$

$$R^2_{Y_{12} \cdot x_{12}, x_2, x_3} = .37295$$

When high school academic performance in English (x_{12}), teacher qualification (x_2) and library facility are used together for predicting academic performance in English at T.T.I. (y_{12}), they are totally responsible for about 37% of

the accountable variance. Although relatively small, this is, infact, a significant prediction ($F(3,128) = 25.38, P < .05$).

In an attempt to show the relative importance of the contribution of x_{12} , x_2 , and x_3 for this accountable variance, the Beta, standard error of Beta, and t observed are presented in table 13.

Table 13: Results of Beta Test on Y_{12}

	X_{12}	X_2	X_3
B	.133	.324	-.234
SEB	.016	.168	.206
$t_{\circ B}$	8.3*	1.92*	-.1.13

* $P < .05$

Note that it is only the contribution of x_{12} ($t_{\circ B} = 8.3, P < .05$) which is outstandingly significant to the prediction of future performance in English at the T.T.I. It accounted for about 32% of the total variance accounted for by the combined interaction effect of the three variables (37%).

Following this comes y_{14} (performance in Biology at the T.T.I.).

Regression equation

$$Y_{14} = .1148x_{14} + .1583 x_2 + -.0689 x_3 + -2.0764$$

$$R_{Y_{14}} = .x_{14}, x_2, x_3 = .63314$$

$$R^2_{Y_{14}} + .x_{14}, x_2, x_3 = .40087$$

The figure above indicates that about 40% of the differences in Biology examination scores are due to the effect of the three independent variables acting together. And, this prediction is significant ($F(3,128) = 28.54, P < .05$). The results of the Beta Test are represented in table 14.

Table 14: Results of
Beta Test on Y_{14}

	x_{14}	x_2	x_3
B	.145	.158	-.068
SEB	.017	.177	.224
	8.5*	0.8	-.30*

* $P < .05$

In this case too, it is only the contribution of academic achievement that is relatively and much more significantly related to future academic performance by accounting for about 28% of the total (40%).

In all interaction coefficients derived from the regression run on criterion variables y_{11} , y_{12} , and y_{14} , the leading position is taken by previous academic achievement. Of course, the independent contributions of library facility in Amharic and Biology, and that of teacher qualification in English are statistically significant. But, these contributions are low relative to that of academic achievement. On this basis, it can be said that, as compared to the two variables, prior academic achievement is the most predominant predictor of future success in the T.T.I. With this, one may proceed to see the implications of the effect of prior level of achievement upon future performance as regards the curriculum.

3. Implications upon the Curriculum Development
Process of the Direct Effect of Prior Academic
Achievement upon Future Performance

The results of this study tended to show that the trainees studied who had low level of achievement in secondary schools also exhibited low level of performance in the T.T.I. Thus, we see that there are direct correlations in achievement at the two levels.

One area which could obviously contribute^{to} the raising of the low level of performance exhibited at the T.T.I. is the curriculum. The curriculum, based on theoretical and empirical considerations, could suggest or prescribe areas

of content which would be instrumental in the effort made to raise performance levels. The difficulty can also be reduced by the prescriptions of the curriculum which, upon a study of the magnitude of the problem in the level of performance, suggests the employment of relevant activities that could possibly lead to better performance. Employing additional activities can also lead to the reduction of performance problems. As Timothy Z. Keith (1982:56) suggests, increased homework demands, for example, increase level of trainee performance.

The general results of this study have indicated that the level of performance in almost all subjects in the T.T.I., as reflected by the not significant difference between the expected and observed mean performances, tends to be low. This difference implies that curricular objectives are not attained to the extent they should with most trainees. This may be explained by failure on the part of the curriculum development process, the instructional process, or the trainees themselves.

The failure on the curriculum development part may be owing to a lack of needs assessment, lack of the formulation of enabling objectives or formulation of objectives that are beyond the ability of trainees, the selection of inappropriate level of contents, etc.

The instructional process in the T.T.I. may have failed to provide for expedient teaching-learning atmosphere, such

as additional remedial task which is necessary to raise level of performance. Besides this, the ERGESE recommendation gives hint to another source of failure in the instructional process. It reads "T.T.I. academic staff need to have their own didactic skills strengthened in order to improve the performance of their trainees in the classroom."⁵² As interview results with the principal of the T.T.I. have suggested, it may be due to the insufficient devotion of instructors and their lack of efficiency in work owing mostly to participation in so many public organisations. Although these could be an obvious source of difficulty, it is not easy to take them as causes of low level of performance since they have not been investigated. In some cases, it could be because of the directives and the promotion policy of the Department of Teacher Education which, upon expenditure and other similar considerations, has insisted on not making many candidates failures. Being aware of the absence of strict academic requirements, and knowledge of the almost negligible cases of dismissal might have influenced the outcomes. Learning about this sort of promotion policy may have prevented the prospective teachers from working very hard and exerting maximum effort. All these could give partial explanation to the occurrence of the problem. Yet, they are not studied and, therefore, may not as such be taken as causal factors.

The problems of poor performance may be due to the trainees themselves. Even though the curriculum takes

account of their needs, it could not, however guarantee effectiveness in their level of performance. Trainees may still show weakness in their performance not because their needs have not been considered but due to other factors like lack of effort. As the T.T.I. principal made it known, there were, in some instances, social science students who were unable to locate Guinea Bissau on a political map, for example. There also were considerable number of trainees who were unable to pass make - up examinations. It has also been known through the interview conducted with the principal of the T.T.I. that there have been acute language problems. This is supported by this study where the observed mean performance in English (y_{12}) is almost marginal (6.39). Still, the difficulty could have its origin in the impact of other unstudied characteristics of trainees such as a lack of personal effort, interest, attitude toward the profession, etc.

Thus, without analyzing the problem with the objectives, the difficulty in the T.T.I., and other trainee factors, it would be unwise to attribute the problem exhibited in performance to the curriculum development process alone. Yet, as the concern here is with the development process, there appears to exist little evidence upon which criticism could be built. This is the absence of the objective assessment of needs.

The T.T.I. curriculum is mostly developed jointly by

T.T.I. instructors and experts from the T.T.I. curriculum panel. This task is accomplished by way of workshops organized for each syllabus and co-ordinated by the experts from the panel in most cases. As the chief expert co-ordinator explained during interviews, trainee needs have not been objectively assessed in this process of development of the curriculum. It would logically follow from this explanation that the failure to empirically assess needs might have led the developers to formulate objectives beyond the level of readiness of trainees, or select inappropriate level of contents and activities, or not to suggest some measures essential to fill the gap.

As a whole, the curriculum development process appears not to have been considerate to trainee needs. If it was based upon a clear analysis of needs of trainees, such as on empirical studies of trainee achievement level at the high school, and not on assumptions as the co-ordinator explained as a participant in the workshops, perhaps, the results might not have been those reported in this study. Moreover, had that not been the case, the developers would probably have formulated the right level of objectives or suggested activities and other mechanisms like enabling objectives that could help the attainment of instructional objectives, or proposed better criteria of admission and so on. Based on this, one may safely say that the curriculum tends to reflect weakness in this major respect, which is a crucial step for developing a curriculum as stated in the statement

of the problem. perhaps, failure in this step might have equally led to failure in the remaining successive steps.

It does not seem enough to study academic ability and experience as a causal factor responsible for low level of previous achievement, and eventually for low level of future performance. Even in this study, it has accounted only for some 30 to 40% of the total accountable variance (100%).

Low level of performance could be due to the effect of some moderator variables such as motivational conditions and effort. Still, it could be owing to the influence of the attitudes, opinions, traits, preferences and values held by trainees as regards their past, present, and future. Perhaps, as the principal of the T.T.I. suggested, it could possibly be attributed to a lack of interest in the training programme although this is not yet studied and empirically supported. What this shows us is that curriculum developers are supposed to study (identify) an optimum possible number of these characteristics of trainees prior to formulating objectives, selecting and organising contents and activities, etc. Where there is failure to identify trainee needs, the developers would most likely be tempted to create needs. And, where the tendency of creating needs but not identifying them prevails, effectiveness would be endangered as the needs assumed may not be the exact needs that can promote the effort made to raise the level of performance in the T.T.I.

The problem may be due to the failure of the T.T.I. to optimally implement what is prescribed and, then, facilitate learning that could lead to better performance. This should have been thoroughly studied and evaluated by curriculum developers as one area capable of affecting performance. It could have also been studied on the basis, at least, of the theoretical consideration that achievement is jointly influenced by a number of factors.

Had the curriculum developers studied potential or real problems as effectively as they could provide that there are traces for the existence of any such problems, they could have suggested ways how to use resources available including human time and effort as efficiently as possible. These resources could be employed to improve much relatively alterable factors as motivation, amount of time devoted to academic work (e.g. study hours, home work), classroom environment, etc. These factors are themselves predictors of future performance. Lack of conducting this kind of study appears to have been the practice as regards T.T.I. curriculum development process currently.

As Centra and Potter (1980) argue, student learning is influenced by many factors such as parental expectations, peers, and, most of all, students themselves. Virtually, this means that decisions upon the curriculum (e.g. the level upon which objectives can be realized) should be based upon a study of an optimum number of these variables.

In this regard, this study has tended to demonstrate that even one important variable, that is, level of previous achievement has not been effectively studied. Studying this and other factors such as the impact of effort alone could well lead the developers to suggest to the process of instruction that it is essential to instruct candidates to increase their effort. It is apparent that it is through these kinds of measures that we may be able to raise level of performance upto expectations.

The other source of some evidence for basing criticism seems to be the relative absence of comprehensive and continuous evaluation of the effectiveness of the curriculum with the training programme it guides. As the panel co-ordinator explained, it is only in some two or three T.T.I.'s that annual visits are paid. Moreover, as the same expert released it, these do not go beyond simple supervision of activities in the classroom in some classes and some exchange of views with principals. Teachers are not mostly communicated in order to know and understand their impressions, difficulties, and obstacles in the programme. Trainees are not for the most part contacted and their learning problems explored, and their needs identified. Almost no empirical studies are also conducted to assess the degree to which curricular or instructional objectives have been being realized. If this is the case, can this tour of selected T.T.I's then be considered curriculum evaluation in the right sense

of the term ? How can this practice that may safely be said insufficient tantamount to effective and appropriate curriculum evaluation ? The answer is most probably in the negative. This problem of lack of sufficient curriculum evaluation is attributed to the shortage of man-power in the panel. This tends to be true as there are only two experts working at the level of curriculum development for the T.T.I. Yet, it appears that they have not tried to do what they could have done in their capacity as explained earlier.

Interview results have suggested that the developers of the curriculum (syllabuses) have not studied would be candidates. Had they tested (studied) potential candidates in the secondary school, one may safely say, they would have been in a better position to improve the curriculum. Responses to interviews have also yielded that even ERGESE's report which reads "According to results from specially prepared Curriculum Department tests in the different subjects, overall achievement is far below expected criteria."⁵³ has not been utilized and capitalized to advantage. That could be one reason why it can be argued that work is still under progress, probably, not on the basis of what trainees actually need but on the ground of what it is thought they need and on the kind of competence they are supposed to develop.

As Doyle Watts (1982:120) argues, there is no reason to believe that less ability is required to become a competent,

successful teacher than is necessary in other professional fields. This argument of Watts tends to indicate that there is that need to improve the quality of the preparation programmes by way of recruiting more promising candidates. What could then be said is that by studying level of achievement the curriculum developers could get the benefit to suggest the possibly right score averages that could entitle an applicant to get admission in the training programme. Primary education, above all, provides the necessary basis for the child's future learning. Hence, as Watts suggests, it appears essential to select more competent candidates.

One rationale for selecting abler candidates is the requirements of the profession which are numerous. With regard to this, Hopfengardner and associates have to say this:

First individuals recruited into teaching should be able to understand and apply theory. The professional teacher must be able to engage in theoretical analysis. Theory provides essential explanatory and predictive power; it enables teachers to make sense out of events that appear haphazard. Teachers deal with many different learning problems during a school day; they must be able to diagnose student learning difficulties and prescribe appropriate activities. Teachers who understand personality theory, learning theory or motivation theory may be better equipped to provide effective instruction.⁵⁴

Adding to these requirements, they have further stated that

Individuals recruited into teaching should have the ability to engage in professional decision making. Teachers are confronted with literally hundreds of situations each day. They must have the ability to respond to problems quickly and exhibit the capacity to make appropriate applications of theory into practice.⁵⁵

To what extent could most of the above stated tasks be accomplished much more effectively by recruits with low level of previous achievement, and with much higher degrees of probability to perform lower as trainees ? perhaps, it may be to a very low extent. That appears why Hopfengardner and his associates advocate the need to select academically abler students. To use their words "Teacher educators, therefore must recruit intellectually talented individuals who have the interactive skills necessary to cope with the difficulties of teaching." According to them, the problem is one of "... finding predictors for these interactive skills." To this problem, they suggested "College board scores and high school grade point averages are a partial indication of academic ability."⁵⁶ As has already been pointed out, by way of studying previous level of achievement, what may be taken the right level of score average at the high school could have been suggested by developers to attain better effectiveness in the training programme.

Standing by the side of Hopfangardner and associates, Doyle Watts advances the view that

A Profession should select new trainees on the basis of their potential to conduct successfully the duties and responsibilities of that particular profession. Therefore, great care should be exercised when designing the selection process for the teaching profession.

Therefore, he advises that

Persons who lack the necessary talents required by the profession should be guided into other vocations which provide them with great opportunities for success. Also, the admission of those with inadequate ability is damaging to the quality of the preparation programmes as well as the profession. The most important reason for a careful selection process is, of course, the welfare of the clients that the profession serves.⁵⁷

How can the curriculum developers, as one of those responsible for the smooth functioning of the programme, know that the right candidates are selected? How can they realize and ensure that the appropriate remedial measures are taken to raise performance level upto expectations? It is mostly through curriculum evaluation. Thus, is the curriculum evaluated from time to time on the basis of the principle that curriculum development is a continuous process. Do the workshops use results from rigorous empirical studies conducted to see the effectiveness of the curriculum? How can the developers know whether those individuals with meagre ability complete training in teacher preparation programmes with meagre levels of performance and secure positions as teacher practitioners in the elementary school? Where there is

probably no empirical research and appropriate curriculum evaluation, perhaps, it would be very difficult to know.

The mean performance in almost all academic subjects in the T.T.I. does not seem to have risen significantly above the expected mean. This tends to indicate the prevalence of average and, perhaps, low level of performance. It seems that even this is not studied, known, and provided for. This, in turn, suggests that the needs of trainees have not been identified be it at the very outset of the development process or from time to time. It can then be argued on the basis of the views of Doyle Watts that "As long as preparation programmes attempt to function without basing practice upon empirical knowledge, their inferior status will surely continue."⁵⁸

It is, then, in the belief cherished by the researcher that both the curriculum developers, and all others responsible for the teacher preparation programmes have joint responsibility. This is they have to ensure that the products of the programmes have the necessary ability and potential (input) and have developed into effective classroom teachers (output) before they assume their role in the world of teaching.

From the effect of previous level of academic achievement upon future performance and perhaps, the results of interview, we may deduce that as one of those processes responsible for effectiveness in training, the curriculum development process has not been as effective as it should have been. This

failure may possible be attributed to lack of careful and persistent employment of the steps in developing the curriculum, be it at the initial stage or with changes over time.

Performance is low at both levels. It appears that it has remained to be low because it has not been provided for so as to remedy the difficulty. It has not been sought solutions possibly because it has not been known. Knowing it and consequently providing it for is one of the tasks of the curriculum development process. Yet, it seems it has not studied the problem. Thus, the persistence of the problem tends to reflect the existence of failure to study the problem, identify it and provide for it by the curriculum responsible for guiding the programme. This is, then the curricular implication of the impact of low level of prior achievement upon low level of future performance.

It has been found out, in this study, that previous achievement has affected future performance. Does differential exposure affect future performance? It is to investigate this that we shall proceed to compare the T.T.I. performance of trainees from different streams of study in the high school.

4. Comparison of T.T.I. Performance of Trainees with Social Science and Natural Science Backgrounds

This part of this chapter deals with the effect of

differential academic exposure upon future performance. As has already been indicated earlier in the chapter, the impact of differential exposure has not been measured together with the rest of the independent variables. It has not been measured in both inter-correlation and regression methods. Since the influence is measured separately and differently, it requires a separate discussion.

To explore the impact of differential academic exposure, we proceed to compare the performance in the T.T.I. of trainees with Social Science and Natural Science background in the secondary school. Besides that, the results of the comparison made between the two groups of trainees are discussed alongside their particular curricular implications for reasons of convenience in explanation. The following table shows the magnitude of performance:

Table 15: Means and Standard Deviations on Performance in the T.T.I.

Performance	Biology	Chemistry	Physics	Geography	History
Composite Mean	7.1	6.2	4.8	6.1	5.5
Composite standard deviation	1.2	2.5	.9	1.4	1.9
Mean Social Science	8.2	3.5	4.1	7.4	7.3
Standard deviation Social Science	.9	1	.8	.9	.9
Mean Natural Science	6.7	7.1	5.0	5.7	4.9
Standard deviation Natural Science	.3	.3	.2	.3	.3

The mean performance of Social Science students in Biology is about 1 standard deviation above the common mean while that of Natural Science students is about .3 standard deviation below that common mean. This shows better performance of Social Science students in the T.T.I.

As the table above indicates, while the mean performance of Social Science students in Chemistry is about 1 standard deviation below the mean, that of Natural Science students is approximately .3 standard deviation above the composite mean. This indicates that the latter group of trainees achieves more than the former.

The mean performance of Social Science students in Physics is still far lesser than that of Natural Science students.

The table indicates that the mean performance of Social Science students in Geography is about 1 standard deviation above the common mean whereas that of Natural Science students is about .3 standard deviations below the common mean.

When it comes to History, while that of Social Science students is about 1 standard deviation above the composite mean, Natural Science students' is about .3 standard deviation below that mean. This reveals that more exposure has tended to give rise to more later day performance. It also seems to indicate that a trainee's highest performance in the T.T.I. is likely to be his chosen field of study while being in the secondary school.

As can be recalled, the results in table 15 are derived from examination results in the T.T.I. administered to

trainees who had varying degrees of exposure to the areas that were tested. It is in connection with this influence of differences in exposure upon test results that Philips and Mehrens suggested that "Any differential impact of curricular offerings on test results has implications for the type of curricula we offer."⁵⁹ This shows that the curriculum should be considerate to variations in performance resulting from the impact of differential exposure.

It is in connection with this kind of direct relationship that a question arises: to what extent does the same ability tend to consistently go together at two different levels in the same individuals? Is the individual who is more exposed to and is superior in one subject likely to be superior in the performance of that same subject? The measures of correlation used to answer this question have somehow indicated that the same ability has a tendency to go together at two levels in all subjects. This is shown by the relationship between the levels of achievement in the high school in Biology, Chemistry, Physics, Geography, and History, and performance in these subjects in the T.T.I. whose correlations are .7, .6, .7, .3. and .4 respectively. The best correlations are in Biology and Physics showing that the coefficients are strong predictors. Moderate correlations are in Chemistry and History. Although the lowest, that of geography is still able to show the direction of relationship to some significant degrees.

One of the questions raised in the questionnaire administered to the instructors of these subjects in the T.T.I. is about the existence and magnitude of relationship in content between these subjects at the high school and T.T.I. levels. All the instructors (5) have acknowledge that the content of what they teach in the T.T.I. is related to that in the high school. However, they differ in the responses they have given as regards the magnitude of this relationship. Two have responded "very high", another two "high" and one "low". This demands rigorous content analysis as a basis for justification. Based on the responses given, we may say that there are some degrees of relationships between the contents at the two levels. The direct relationship in the performance of trainees may also be taken as one source of evidence capable of adding to the effort made to justify the presence of relationships in content at the two levels: high school and T.T.I.

In general, what has been done to compare performance results between groups of trainees with different levels of academic exposure reveal that there is a tendency for higher performance with larger degrees of exposure to a certain area of interest and ability in secondary schools. This is consistent with the ideas held by researchers such as Tobias (1976) who proposed that "... instruction affected achievement as it interacted with learners' prior achievement or familiarity with the subject-matter."⁶⁰ One can easily observe

that trainees with Social Science background are far better in Geography and History while Natural Science students are much better in Chemistry and Physics.

The results of what has been compared between the two groups have also tended to show us that individuals will not be able to progress in their learning until they have mastered some important background information. And, this obviously necessitates some extra instruction. That seems why Social Science students show lower levels of performance in Chemistry and Physics, and Natural Science students in Geography and History. On the other hand, when we compare the performance of Social Science students in Chemistry and Physics, and that of Natural Science students in Geography and History, we can observe that Social Science students are about 1 standard deviations below the mean, whereas Natural Science students are approximately .3 standard deviations below the mean. This signifies that Natural Science students tend to be better in those subjects to which they were less exposed as compared to Social Science students. Thus, this suggests that more extra instruction ought to be given to Social Science students in Chemistry and Physics in contrast to that of Natural Science students in Geography and History.

That being the case, there appears to exist the need to qualify the above claim. The T.T.I. performance differences may not be exclusively attributed to the differences in the

magnitude of time of instruction that was taken at the secondary level. One many find it difficult to say that such an outcome is due particularly to differences in prior exposure. Some other variables ought to have been controlled in order to unequivocally ascribe the outcomes to variations in the degree of exposure in earlier days. The support for this argument comes from Greene (1985:72) and Thorndyke (1981:295).

Greene advances the view that success in school is one of the best indicators of success in later activities. Test results, according to him, usually predict with some degree of accuracy what a person will do in later learning. Nevertheless, he argues that tests can not be absolutely accurate since there are other factors which could affect achievement like motivation, interest, aspiration, self-concept, etc. These, as to him, are not measured by achievement tests while they are variables that can influence achievement.

Nevertheless, as this same scholar admits, very often test results which are not accurate enough to be used for individual predictions are valuable in showing group tendencies. This is because even if the behaviour of many persons in a group varies from time to time, the scores of the group often remain constant for longer periods of time. In a large group, individual variations tend to occur in such a way as to balance each other. Thus, it can be said that tests

provide accurate knowledge of present status, predict trends of growth and development, and present evidence more clearly.

Based on the above view of Greene, it can be argued that there is something essential and common among the members in each group which can characterize them all, that is, direct relationship between their past and future results. There could exist variations in motivation, socio-economic status, and the like among members in a group. Some of the trainees who are less exposed to an area may even perform better than those who are not deficient in that background factor. However, when each group is taken as a single whole, we can obviously see that the over-all tendency in performance increases with more exposure and decreases with less exposure.

Thorndyke has also insisted on making precautions when one attempts to use the information from each evaluation technique in decision-making. This is because of the assumption that other factors could affect the information provided by a test. He, however, admits that "It should be emphasized that any performance depends to some degree upon life experiences if not on school experiences."⁶¹ In line with this, the investigation made has indicated that differential school level exposure has got a direct impact upon future performance although the magnitude does not appear that large in most subjects studied. Hence, since there could be a room for us to say something on the basis of what has been found

out, it can be suggested that academic differential exposure has had a direct role to play in determining the nature of the outcomes, and is directly related to future performance.

Questionnaires were administered to five T.T.I. instructors in order to obtain their impressions in relation to the impact of differential exposure.

The total number of teachers teaching these subjects is five. Therefore, all have been taken as interviewees.

All of them are male by gender. There are variations in the number of years of experiences they have had. These range from two to twelve, i.e. History, Geography, Chemistry, Physics, and Biology had two, twelve, eight, eight, and nine years of experience respectively. They all have first degrees in their respective areas of study (B.A. or B.Sc.). With this, it has been anticipated that they are in possession of a fair number of years of experience, and what may be labelled an adequate qualification which would put them in a better position to identify learning difficulties in their students, and give remarks about their different attributes.

With this bio-data about the respondents, we shall proceed to have a look at the responses given to the questions raised.

Table 16: Rate of classroom participation of trainees

Alternatives	High		Medium		Low		D.N.A.*	
	No	%	No	%	No	%	No	%
Those who learned the subject up to grade twelve	5	100	0	0	0	0	0	0
Those who didnot learn the subject upto grade twelve	0	0	2	40	3	60	0	0

The table shows that those more exposed are rated as higher participants while their counterparts somewhere below that.

Table 17: Degree of difficulty in answering questions in the classroom

Alternatives	High		Medium		Low		D.N.A.	
	No	%	No	%	No	%	No	%
Those who were more exposed	0	0	0	0	4	80	1	20
Those who were less exposed	4	80	0	0	0	0	1	20

The table No. 17 indicates that the less the degree of exposure, the higher the degree of difficulty.

*Data not available

Table 18: Performance level of trainees in quizzes, tests, assignments, and examinations

Alternatives	High		Medium		Low		D.N.A	
	No	%	No	%	No	%	No	%
Those more exposed to the subject	4	80	0	0	0	0	1	20
Those less exposed to the subject	0	0	0	0	5	100	0	0

In general, those trainees with some degree of exposure to the subject while being in secondary school tended to be in a more advantageous position.

All the respondents have acknowledged that they have devised mechanisms to help those trainees who faced difficulty to cope up with the requirements of the subjects they teach. But, they differ in the specific ways they usually employ to this effect as the following table indicates:

Table 19:
Mechanisms employed to help low achievers in the T.T.I.

Mechanisms	No	%
1. Tutorial classes	0	0
2. More assignment like homework	3	60
3. Alloting specified time for individual consultation and help	4	80
4. Alloting specified time for group consultation and help	0	0
5. Any other mechanism	0	0

The majority of the respondents agreed on the mechanisms that appeared on numbers two and three. There are also differences in the frequency with which help and assignments are given. The following table shows this:

Table 20: Frequency with which mechanisms are employed

Mechanisms	Once in a week		Once in two weeks		Once in a month		Any other	
	No	%	No	%	No	%	No	%
More assignment	2	66.6	1	33.3	0	0	0	0
Individual help	2	50	1	25	0	0	1	25

One respondent has responded that he employs the latter three times a week. If all these are done, it appears that there is appreciable effort. Yet, all these efforts do not seem to have contributed significantly so as to minimize the gaps in achievement gains attributable to disparities in earlier day exposure to different areas of study.

The curriculum panel admits that there could exist variations among candidates owing to the effects of differential exposure. It has even gone to the extent of prescribing some measures that should be taken as regards Biology (see appendix 4). The remaining subjects have not been so far considered. Thus, still the problem demands some kind of solution.

The solutions suggested are many. Some suggested that providing the less exposed with remedial classes by identifying the areas in which the trainees have exhibited deficiency could be a solution. The instructors in Physics and Chemistry suggested that increasing the number of contact hours could alleviate the problem. Others found it recommendable extending the period of training from one to two.

Arranging remedial classes is really appreciable. As far as increasing the number of periods is concerned, it seems difficult as the time - table tends to have already been congested with periods allotted for all the twelve semesterial subjects. However, there may be a possibility for re-considering the over-all distribution for purposes of re-distribution. As regards increasing the period of training, this does not seem feasible. This is because as the study entitled "A survey of Teacher Education in socialist Ethiopia (1981)" made it clear, it is the policy of the Ministry of Education not to increase the number of years of training until such time that Universal Primary education is attained.

The expert from the curriculum panel and the instructors in the T.T.I. have tended to agree on the division of trainees on the basis of their areas of interest and ability in high schools and providing them with some sort of special training. This view goes in the with what Pauline Gough suggests.

According to Pauline Gough, training programmes should prepare elementary teachers' to specialize. This specialization could be either in language arts / social studies or in mathematics / science for employment in departmentalized teaching situations. The need for this arises from the assumption that elementary teachers are, like other people, good at something and less competent at others. Due to this, they are highly likely to transmit feelings of uncertainty or ineptitude to their students, either openly or through subtle emphases, on those subjects in which they feel least competence. Inevitably, teachers' weaknesses in given disciplines are passed along to their students.

Gough further notes that such a problem creates obstructions to effectiveness in the teaching-learning process in the following words of his

Whether these weaknesses stem from the shotgun approach to pre-service preparation or from teachers' individual differences in preference and ability, the fact remains that teachers can not teach effectively and enthusiastically what they have not mastered themselves.⁶²

As to Pauline Gough, specialization is the solution to this kind of problem. He suggests that specialization solves this problem by giving prospective elementary teachers the freedom to concentrate their studies in areas that match their interests and skills. Moreover, because of this kind of self selection, teacher educators could get the

opportunity to plan more rigorous academic programmes within each specificity. The introduction of rigorous academic programmes is, therefore, the other advantage of specialization essential to promote the effort made to raise academic standards and, with this, teacher quality.

While emphasizing on the usefulness of specialization, Gough continues to claim that

... the major advantage of specialization is increased time to intensify pre-service training. For the language arts / social studies specialist, for example, this extra time might mean a broader background in history, economics, political science, and social issue. It might mean exposure to a wide array of instructional materials in the social studies and in reading - not to develop a dependency on such materials, but to provide the experience with a range of theoretical approaches and supporting research that fosters eclectic teaching to meet individual needs. More time might mean better training in writing and in the teaching of writing ...

To what he has already advocated, he attempts to add that

The list could go (and a similar list could be developed for pre-service math /science specialist), but I have made my point. Specialization affords the luxury of more time, and if that time is widely used to provide more intensive and more rigorous training problems, teachers will be better prepared to develop and manage effective classrooms.⁶³

At last, he stresses on the need to include some courses in Art and Music depending upon each trainee's abilities and interests.

Hence, it follows that in spite of looking for ways out just like the above one, providing trainees not with alternatives for better success but rather forcing them into fixed educational and training pattern appears to be the present-day practice promoted by the T.T.I. and the curriculum that guides it.

The workshops meant to develop and up-date the curriculum could not be expected to bring about the kind of change desired since the question is related to the educational policies of this country. But, they could suggest what could be feasible to the policy-making body of the Ministry of Education. Yet, it appears that they have not done so far.

To wind up this part, although relative specialization in chosen broader areas of study (e.g. social science, natural science, etc.) seems appropriate on the basis of trainee needs with particular regard to what has been studied and found out, James argues that "Nonetheless, decisions have to be taken about teacher education by students, teachers, college and University personnel, and by local, regional, and national government officials as well as by many others."⁶⁴ This should be the case since the development of the curriculum for a given programme must be a co-operative endeavour. This is what for the most part guarantees effectiveness. Short of this, prospective teachers may not be as effective as they should in assuming their role and in meeting social needs. Lack of competence

may lead them to be ineffective to reproduce and produce knowledge. Put differently, it would be very difficult for them to shoulder and discharge the responsibility of transmitting what is worthy of transmission to the present generation, and also contributing to the transformation of the very society in which we are living.

It is with this that we finally proceed to the concluding part of the study.

CHAPTER V

CONCLUDING ASPECTS OF THE STUDY

This part tries to point out the major findings of the study. Some generalizations are also made on the basis of what the study has found out. At last, some suggestions are given based on the results of the study.

Summary and Conclusions

A search of the literature pertaining to variables which account for differences in future academic performance reveals that, indeed, several such variables could be identified and studied. The predictor variables considered were chosen for the present study not only because previous research and literature reviewed herewith have shown them to be important areas of influence on academic performance, but they are, some how, among the felt areas of problems at the two levels here as witnessed by some studies conducted in this country.

This study has demonstrated that academic performance of a trainee is positively and significantly correlated with previous academic achievement and differential academic exposure in the secondary school. The remaining two independent variables have not been able to show any direct and significant relationships with future academic performance in the T.T.I., generally speaking.

The results of this study, therefore, suggest that academic background is a cause of later day academic deficiencies or gains. Put differently, academic background of a trainee is what accounts significantly for good or bad performance. This result is consistent with many of the findings of the past in that it has also indicated that performance, infact, differs as a function of high or low scores obtained from measures of past academic achievement, or revealed that measured background is in some identifiable ways related to later day performance. What is more, it has also shown that performance differs as a function of higher or lower degrees of prior exposure.

The data collected indicated that academic performance increased with higher levels of previous achievement and more degrees of differential exposure. And, this, in part, implies that the curriculum responsible for the training programmes tends not to have been responsive to trainees of low academic status and relatively lower degrees of exposure in identifying their needs and designing educational experiences that could give them the opportunity to become prepared to perform higher and better.

The above are the major findings with respect to the samples of his study. What then can we possibly generalize about the population from which the samples are drawn ?

Based on the empirical research conducted using

statistical analyses and other relevant tools as well as theoretical considerations, one can say that the background factors which included previous achievement and differential exposure tended to predict future academic performance to a significant degree. In general, there exists a considerable degree of association between the outcomes of previous learning and those of future academic work.

On the other hand, the results of this study do not support the hypotheses predicting relationships between teachers' years of tertiary training as well as size of books in school libraries on the one hand, and future performance on the other. Thus, it can be generalized that the performance of trainees on T.T.I. examinations is an outcome of their individual academic background but not of the level of qualification of their teachers and the volume of books and other reading materials available in the school libraries from which they came.

The problem of low level of performance in the T.T.I. tends to have been a prevalent difficulty. The failure to solve this problem may have its source in the curriculum development process, or in the programme of the T.T.I., or in the trainees, or in any possible combinations of them. In any case, what this state of affairs reveals is that a considerable number of the curricular and instructional objectives are not realized by most trainees as reflected by

the mean performance of the samples which is not significantly higher than the expected.

The objectives of the curriculum appear to have been difficult for maximum level of realization. This is witnessed by the statistical distance between the observed mean and the expected maximum in the majority of subjects. Studying and knowing this could render help to modify these objectives so as to fit the desired trainee level, or recommend relevant activities so necessary to raise performance to an optimum degree, or suggest better admission criteria that could be used to select the right candidates. The persistence of the above problem points to the conclusion that some kind of shortcoming which has its source in failure to study and remedy performance difficulties is still prevailing in the curriculum development and instructional processes.

Although, at this point, we ought to refrain from remarking the objectives are certainly inappropriate or beyond the level of ability of trainees since we have not investigated them in the context of this and other attributes of trainees, the reason that they have not been identified, above all else, may help us to conclude something. This conclusion is that there could be something wrong with the objectives and, with this, something wrong with the curriculum development process.

When it comes to the evaluation of the effectiveness of the curriculum, this task has not gone beyond simple annual tours, classroom observations, and some sort of discussions with officials in the T.T.I. This has been known through the interviews conducted. Trainee learning difficulties are said not to have been identified either by direct contacts or by way of empirical studies. This tends to indicate that this step in curriculum development and change is not properly and reasonably employed. The curriculum's nature of being dynamic, a continuous process seems to have been neglected. Work in training appears to be still underway on the basis of the profile of trainees that was given by the Department of Teacher Education years ago, as the expert coordinator expressed, and not on the very foundations of the experiences gained after the curriculum was put into full operation.

It has been many years since the current curriculum came to force. Yet, we observe almost the same kind of tendency as far as trainee performance is concerned. This points out that many objectives are not fully realized. The fact that many objectives have not been achieved to the extent they should testifies that many areas of content are not being fully mastered.

It is said that instruction can bring about a remedial effect. But, still, it does not seem to have brought about

that influence considerably. The curriculum developers seem not to have investigated what has been going on in relation to the practice in the instructional process so as to find out the possible causes of low level of performance.

In general, interview results and the outcomes of this study suggest that trainee needs have not been initially identified prior to the formulation of objectives. Moreover, the effects have not been substantially investigated after the curriculum was implemented. Still there does not seem to exist a change in the trend of performance of trainees, which may be described lower. Given this state of affairs, how can the curricular objectives be realized to the utmost possible? How can the programme be effective in fulfilling the tasks entrusted to it? Hence, it may be concluded that the curriculum development process has not so far been as effective as it should have been in guiding the programme in the teacher training institutes, and in much more significantly contributing to the fulfilment of the tasks expected of them. It is this that gives us the ground to suggest some points in recommendation.

Recommendations

The interest of this study is not in what should be done at the high school level. Rather, it is in what could be done by the training programme so as to hopefully find the remedy to the problem of lower level of performance in the T.T.I.

In view of this, the researcher has thought it wise to recommend the following on the basis of the major findings of the present study.

1. The T.T.I. should develop a system essential to assure desirable quality in the products of the programme. What is crucially important in this system to be developed is the optimization of opportunities for better performance. To this effect

- Student learning is considerably a function of the instruction received (Goldberg, 1967). And, this instruction could lead to a better performance if it is provided in a more suitable learning environment, (setting). This learning environment, in turn, could be most helpful and effective if the instruction in it is based upon knowledge of learner learning difficulties, (needs). Thus, the T.T.I. should create some ways of diagnosing trainee learning deficiencies and, using these as a stepping stone, provide help for their identified needs. One way is using tests of entry behaviour, or pre-testing trainees based on their secondary school records and exposure. The results could fruitfully be used as a spring board for devising appropriate mechanisms useful for improving their future performance test scores.

- remedial programmes should be designed and organized for groups of trainees primarily to provide for basic deficiencies and also to prepare candidates for their future

task. These could also include individual and group consultations if there are problems of motivation and effective classroom participation in addition to academic ones. To low achievers, more homework and more assignment could be used as these are believed to have a considerable positive influence on achievement (Timothy Z. Keith, 1982). Special treatment like tutorial classes could well be arranged for problems emanating from deficiencies in the degree of prior exposure.

2. The T.T.I. should persuade teachers to conduct researches on factors related to problems of academic learning. These are thought to offer very promising suggestions as to how individual teachers might enhance academic achievement (William Cubbett, 1982). The results of these researches, provided they live upto standard, should also be presented in the workshops organized to develop the curriculum. On top of this, teachers should be advised and encouraged to make a realistic appraisal of the academic problems of low achievers in the T.T.I. and to give different kind of attention that is due to them.

The above effort to optimize opportunities for success does not in any way imply suggesting minimal requirements. Simply reducing the requirements to the level of the trainee will not assure him that he will have the competence necessary to succeed in the world of work.

3. Although the outcomes of this study have suggested that the predictor variables 'Teacher Qualification' and 'Library Facility' are not significant predictors of future performance in the T.T.I., they may not lead one to hastily conclude that these factors do not have any effects at all upon future achievement. Rather than that, they point to the need to investigate the effects of some other important variables such as teacher experience, effort, interest, etc. and student rate of use of books available in a library, etc. Since all these are important predictors of future level of achievement, the fact that they have not been controlled in this study might have prevented the predictor variables from showing any significant relationships. Thus, studies should be conducted on these and similar pertinent variables affecting performance.

4. As Howsam (1982) claims teacher education is essential to an educational system since the latter heavily depends on the former. As to him, upgrading the teaching profession helps in upgrading the quality of education. Curriculum developers, therefore, should be cognizant of this and develop a relevant curriculum for teacher education by adhering to the steps outlined earlier. They should suggest, based on empirical studies, more effective teaching techniques, and improved guidance and counselling services, etc. where they are instrumental to meet ends. They also need to

- work in close co-operation with practitioners in the
T.T.I.

- contact trainees and study their learning problems.
- evaluate the progress in the implementation of the curriculum from time to time so as to provide for shortcomings in their earliest convenience.

5. On the basis of the results of this study and, perhaps, in conjunction with the findings and suggestions of other pertinent studies, specialization may be recommended as a basic solution to the prevailing problem in the T.T.I. as far as trainee need is concerned. But, since this may be beyond what the country can afford to do at the moment, relative specialization as suggested by Pauline Gough is here also suggested as a remedy to problems emanating from differential exposure.

To realize the above, some sort of placement evaluation is necessary. This evaluation helps to know the trainee's entry performance. Based on this performance, one can obtain information on whether or not the trainee possesses the knowledge and skills needed to start training. Other than this, interest in and preference to a particular broader area of specialization should be known using some mechanisms like interviews and trainee secondary school records. Moreover, the policy of the Ministry of Education which requires trainees to teach all subjects should be modified to allow them teach only those subjects within the scope of their areas of relative specialization. It is only on this ground that the T.T.I. can adopt such a programme.

The foregoing suggestion is based on the results of this study and on theoretical considerations. Admittedly, it is not based on an analysis of the problems teachers are facing in teaching in elementary schools. Therefore, there still exists the need to study if there are problems of teaching owing to the absence of relative specialization in pre-service preparation in the T.T.I.

At last, Gronlund (1981) claims that no important educational decisions should ever be based on test scores alone. Hence, to effectively and maximally exploit the results of this study, further research should be undertaken on other indispensable variables related to performance. This is because unfavourable conditions in any of these variables could cause or contribute to performance problems.

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LIST OF APPENDICES

Appendix 1

Interview Questions to Experts in the panel for Primary Level Teacher Education Curriculum Development.

Institute for Curriculum Development and Research

1. Which particular model do you employ to develop the curriculum for Primary Teacher Training Institutes ?
2. Is the curriculum based upon the needs of the society, the learner, and the views of subject-matter specialists?
3. Have you tried to study the needs of trainees prior to formulating the objectives of the Curriculum ?
4. Does the curriculum assume that all trainees have equal degrees of readiness to succeed in the training programme?
5. Do you know that there are variations in performance among trainees owing to differences in
 - their academic background in the secondary schools?
 - the qualifications of teachers who taught them in secondary schools ?
 - library facilities in the schools from which they are drawn ?
6. Does the curriculum point to the need to fill these gaps if any in order to raise trainee performance to the level desired ?

7. What particular ways are proposed by the curriculum to provide for discrepancies that could arise from differences in student background factors ?
8. Have you ever assessed how the curriculum is being implemented ?
9. Have you ever contacted teachers, trainees, and principals in order to discuss thoroughly on the problems trainees encounter ?
10. Are the contents and teaching-learning activities reasonable enough to reduce the gaps that may be created due to variations in many factors pertaining to trainee background and prior experience ?
11. Have you ever improved the curriculum with changes in time?
12. The general objective of the current curriculum is training generalists. Does not this have problems ? Will this objective continue without revision in the foreseeable future ?
13. Do you think that streaming students in some broad areas of specialization (social science, natural science, language, vocational, etc.) in line with trainees academic background and interest could be one of the practical solutions to the academic problems encountered?
14. What other solutions do you suggest to these kinds of problems ?

Appendix 2

Interview Questions to the principal of the Teacher Training
Institute

1. Have you faced any felt academic problems of trainees ?
2. Have you made attempts to study the causes and the nature of these problem ?
3. Are there any conspicuous differences in academic performance among trainees
 - Coming from different schools ?
 - Having variations in academic background ?
4. Do you hold on regular meeting with the academic staff for purposes of investigating the academic problems of trainees ?
5. What specific measures have you so far taken to alleviate the problem ?
6. Do you encourage and assist efforts exerted by staff members to tackle the problems ?
7. Are these problems solved ? If not what solutions do you suggest to these kinds of problems ?

Appendix 3

Questionnaire

The purpose of this questionnaire is to collect data relevant to the study entitled "Factors that Influence Academic Performance of Trainees in the Harar Teacher Training Institute". Please fill up this questionnaire as honestly as you feel. The information needed is about those trainees who were in the institute in 1978, 1979, and 1981 E.C. (1986, 1987, and 1988 A.D.).

Thanking you in anticipation

Demis Zergaw

School of Graduate Studies
Addis Ababa University

Directions:-

- I. Please insert a "✓" mark in the box corresponding to your response.
- II. Please encircle the letter(s) conforming with the phrases or statements of your response.

1. Gender

- Male //
- Female //

2. Qualification

- Diploma //
- Degree (B.A., B.Sc.) //
- Degree (M.A., M.Sc.) //

3. Years of experience in teaching _____

4. The subject you have been teaching

- Biology //
- Chemistry //
- Physics //
- Geography //
- History //

QUESTIONS

1. Have you ever tried to study and identify the strengths and weaknesses of your students ?

2. What was the rate of classroom participation of your students ?
 - a) Very high
 - b) High
 - c) Medium
 - d) Low
 - e) Very low

3. What was the rate of participation of trainees who continued to study the subject you are teaching up to grade 12 ?
 - a) Very high
 - b) High
 - c) Medium
 - d) Low
 - e) Very low

4. What was the rate of participation of trainees who did not continue to study your subject upto grade 12?
 - a) Very high
 - b) High
 - c) Medium
 - d) Low
 - e) Very low

5. Did you see difficulties in the attempts made to answer questions in the classroom ?
 - a) Yes
 - b) No
 - c) Sometimes

6. What was the degree of difficulty of those who were more exposed to your subject while they were in the secondary schools ?
 - a) High
 - b) Medium
 - c) Low

7. What was the degree of difficulty of those with less exposure to the subject in the secondary schools ?
 - a) High
 - b) Medium
 - c) Low

8. Have you ever studied and identified the causes of variation in students' performance as reflected in marks obtained in quizzes, tests, assignments, and examinations ?
 - a) Yes
 - b) No

9. What was the performance level of trainees more exposed to the subject ?
 - a) High
 - b) Medium
 - c) Low

10. What was the performance level of trainees less exposed to the subject ?
- a) High b) Medium c) Low
11. Have you devised any mechanisms to help those who faced difficulties to cope up with the requirements of the subject you teach ?
- a) Yes b) No
12. If your answer to question No. 11 is in the positive, which of the following did you employ ?
- a) Tutorial classes
- b) More assignment like homework
- c) Alloting specified time for individual consultation and help
- d) Alloting specified time for group consultation and help
- e) If any other, please specify _____

13. Of the above, how frequently did you use what you used ? Please, put a "✓" mark.
- a) Once in a week _____
- b) Once in two weeks _____
- c) Once in a month _____
- d) If any other, please specify _____

20. If the answer to question No. 19 is in the positive, what would be the magnitude of the effect ?

- a) Very high b) High c) Medium
c) Low e) Very low

21. Do you think that streaming trainees in some broader areas of specialization (social science, natural science, language, vocational, etc.) in line with trainee academic background and interest could be a practical solution to the academic problems encountered ?

- a) Yes b) No c) If any other idea,
please specify _____

22. What other solutions do you suggest to these kinds of problems you and your students are facing ?

Kindly specify _____

Appendix 4

Biology Compendium

Preface

This biology compendium prepared for the One Year Primary School Teacher Training Programme is part of the work jointly undertaken by the T.T.I. Curriculum panel and T.T.I. instructors of biology.

It is the result of a try-out material elaborated in the workshop of Mathematics and Natural Science in Awassa in January 1985. The compendium is discussed and finalized with the help of the members of the Natural Science panel of the Curriculum Department of the Ministry of Education.

The content is in accordance with the one year T.T.I. syllabus and has been tried and evaluated in the actual classroom instruction before its improvement through a workshop. Considering the fact of streaming of subjects in the high schools from which the trainees are drawn, the material will assist in providing a basic knowledge in biology, especially for those trainees who have not come through the science stream in the course of their academic studies. Efforts have also been made in checking the relevance of the material to Primary School Science Syllabus and as such, the biology units of grades one to six and the experiments for them are included at the end of the compendium.

Appendix 5

E.S.L.C.E. results of trainees who joined the Harar T.T.I. in 1989

G.P.A.	1.6		1.8		2.0		2.2		2.4		2.6		2.8		3.0		3.2		3.4		Total	
Gender	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Number	1	1	4	1	15	14	26	18	61	14	46	4	27	2	14	3	5	2	4	2	104	61
Total	2		5		29		45		75		50		29		17		7		6		265	

Source: Harar Teacher Training Institute Records Office

14. Does your Institute encourage and assist your effort made to help trainees with academic problems ?

- a) Yes b) Sometimes c) No

15. Have you made attempt to communicate your problems with weaker trainees to the T.T.I. curriculum panel ?

- a) Yes b) Sometimes c) No

16. In what particular ways, if any, have the experts from the panel responded to your difficulties ?
Please specify ?

17. Is the content of what you teach in the T.T.I. related to that of the secondary school ?

- a) Yes b) No

18. If your answer to the question above is "Yes" the magnitude of relationship is

- a) Very high b) High c) Medium
d) Low d) Very low

19. Do you think that prior learning of your subject in the secondary school has any effects upon trainee performance in the T.T.I. ?

- a) Yes b) No

Appendix 6

Harar T.T.I. FIRST SEMESTER RESULT IN CHART (1989)

Group	1.00-1.25	1.26-1.50	1.51-1.75	1.76-2.00	2.01-2.50	2.51-2.75	2.76-3.00	3.01-3.25	Total
G1	-	2	3	5	11	2	1	1	25
G2	1	1	4	5	9	3	2	-	25
G3	2	5	3	4	8	1	2	1	26
G4	1	2	3	7	8	4	1	-	26
G5	-	1	2	6	9	4	2	-	24
G6	2	-	2	5	13	3	2	-	27
G7	1	1	2	8	8	5	2	-	27
G8	-	3	5	5	5	7	2	-	27
G9	1	-	2	4	8	9	2	-	26
G10	-	2	1	6	8	4	4	-	25
Grand Total	8	17	27	55	87	42	20	2	258


Source: Harar Teacher Training Institute Records Office

D E C L A R A T I O N

I, the undersigned, declare that the thesis is my original work, has not been presented for a degree in any other University and that all sources of material used for the thesis have been duly acknowledge.

Name : Demis Zergaw

Place : Department of Curriculum and
Instruction, A.A.U.

Signature: 

Date of Submission: June, 1991.