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LODHI, Tanweer Ahmad, 1929-
DEVELOPING A PRE-SERVICE EDUCATION PROGRAM FOR AGRICULTURE TEACHERS AT WEST PAKISTAN AGRICULTURAL UNIVERSITY, LYALLPUR (PAKISTAN).

The Ohio State University, Ph.D., 1966
Education, teacher training

University Microfilms, Inc., Ann Arbor, Michigan
DEVELOPING A PRE-SERVICE EDUCATION PROGRAM FOR AGRICULTURE
TEACHERS AT WEST PAKISTAN AGRICULTURAL UNIVERSITY,
LYALLPUR (PAKISTAN)

DISSERTATION
Presented in Partial Fulfillment of the Requirements for the
Degree Doctor of Philosophy in the Graduate School of
The Ohio State University

by
Tamweer Ahmad Lodhi, M.S., M.A.

The Ohio State University
1966

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[Signature]
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ACKNOWLEDGMENTS

It seems difficult to acknowledge individually the gratitude I feel toward all of those who have directly or indirectly contributed to the completion of this study. However, I owe a great deal of gratitude to:

my adviser, Dr. Ralph E. Bender, Chairman of the Department of Agricultural Education, The Ohio State University, for his cooperative attitude, willing competent counsel, constructive criticism, and encouragement in the completion of my graduate program and this study.

the members of my graduate committee, Dr. Ralph J. Woodin, Dr. Robert E. Taylor, and Dr. Andrew Hendrickson, for their constant encouragement, guidance, and very valuable contributions in the completion of my graduate program and the study.

the five selected jurors who willingly gave of their time and effort to react to the guiding statements and the recommended program, and for offering valuable suggestions.

my parents, wife, and children for their sacrifice and encouragement without which the completion of my graduate program would have been very difficult.
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CHAPTER I
INTRODUCTION

Orientation to the study

The Province of West Pakistan is overwhelmingly an agricultural province, as 85 per cent of its population depend upon agriculture and animal husbandry for their livelihood. This position is likely to remain about the same in the foreseeable future.

In spite of the tremendous importance of agriculture in the economy of Pakistan, the methods and techniques employed in farming are in most cases obsolete and much of the farming remains at a subsistence level or little above it. Therefore, the yields per acre are very low.

Many authorities have emphasized that one of the ways to improve the methods and techniques of farming is to introduce the teaching of vocational agriculture in secondary schools. As a matter of fact teaching of agriculture in secondary schools has been attempted since 1917. But surprisingly, facilities have never been provided for the training of agriculture teachers for secondary schools. Consequently, inadequately prepared teachers have tried to teach agriculture in secondary schools for the last fifty years. Many parents, students, and others started doubting the utility and place of teaching agriculture in secondary schools. The enthusiasm attached to this measure as
one of the ways of improving farming had almost subsided when the Com-
misson on National Education again emphasized the importance of teach-
ing agriculture in rural secondary schools in 1960.

With the establishment of West Pakistan Agricultural University
at Lyallpur in the beginning of 1962, the job of preparing agricul-
ture teachers was assigned to it. At present this is the only insti-
tution in West Pakistan which is attempting to train agriculture
teachers.

Since the Department of Teacher Training in the University is in
the initial stages of its development, it seems advisable that it
should be provided with a systematically developed program for the
education of agriculture teachers. Such program is not available at
present. Therefore, this study is undertaken to develop a suitable
program for the pre-service education of agriculture teachers.

Background of the problem --
a brief history

The West Pakistan Agricultural University was established on
November 1, 1961, under West Pakistan Ordinance No. XXVI of 1961. At
the time of the establishment of the University, three agricultural
colleges were in existence in the West Pakistan Province. The oldest
of these was Punjab Agricultural College, Lyallpur which was estab-
lished in 1909. The Agricultural University at Lyallpur was estab-
lished around the Agricultural College at Lyallpur. Thus the Univer-
sity inherited facilities in the form of buildings, equipment and staff
which enabled the implementation of the University Plan with a much
time lag. The city of Lyallpur is located in the heart of most productive agricultural area in the Province of West Pakistan and thus offers ready facilities for field studies and extension work and also helps to give the students a strong rural basis which can be very helpful in their formal education at the University and in later life.

The West Pakistan Province is basically the area of service for the University. The students, however, are not only attracted from all over Pakistan but also from many foreign countries. The Province is overwhelmingly an agricultural province as 85 per cent of its population depend upon agriculture and animal husbandry for their livelihood. Pakistan as a whole is basically an agricultural country and is likely to be so in the years to come. The Commission on National Education emphasized this point: "Pakistan is essentially an agricultural country and an overwhelming proportion of its population is engaged and will continue to be engaged directly or indirectly in agricultural pursuits."1

In spite of tremendous importance of agriculture in the economy of Pakistan, the methods and techniques employed in farming are in many cases obsolete. This was noted by the Commission on National Education also: "...it is well known that much of our farming remains

at a subsistence level or little above it, that the yield per acre is extremely low; that primitive ways of farming still prevail.\textsuperscript{2}

In order to appreciate the type of farming and the nature of possible improvements to be brought about which further will be reflected in the preparation of agriculture teachers it will be of interest to know that the overwhelming majority of farms in West Pakistan are small; majority of farmers are either owner-tenant farmers or tenant farmers. Forty-one per cent farms are owner farms, 17 per cent are owner-tenant farms and 42 per cent are tenant farms. Ninety-two per cent of the farms have each an area of 25 acres or less.\textsuperscript{3}

The need for the University

The Punjab Agricultural College, Lyallpur was under the administrative control of Government Department of Agriculture. This arrangement was not satisfactory for many professional leaders as they thought that under that setup the College could not fulfill its role effectively and efficiently in view of emerging needs of the country as a result of accelerated pace of economic and agricultural development. Similar views were expressed by the Planning Board (now called Planning Commission) and the Commission on National Education.

As stressed by the Planning Board, they cannot achieve their highest purpose of intellectual, academic and professional growth and service to the country until

\textsuperscript{2} \textit{Ibid.}, p. 78.

\textsuperscript{3} For more details see \textit{1960 Pakistan Census of Agriculture}, Vol. II, West Pakistan (Karachi: Manager of Publications, 1963), pp. 4 and 12.
they become primarily educational and an integral part of a unified system of education rather than adjuncts of government departments.  

The Commission further elaborated:

We are convinced that agricultural education in Pakistan cannot achieve its full stature under the present system of control by a government department, whose officers are not educators, and are already heavily burdened with administrative matters, and where the colleges are divorced from the atmosphere of scholarship and research which should characterize all higher education.

As a result of this evaluation, the Commission recommended the establishment of the University.

We have given close thought as to how the colleges could best develop if they were to be so detached and have considered various alternative forms of administration and control. We have come to the conclusion that there is immediate need for the establishment of an agricultural university in each wing of Pakistan. Such a step we are certain, would promote the development of teaching and research programs to the highest level.

The establishment of the University was, therefore, designed to improve the teaching and research in agricultural education by providing free intellectual atmosphere. This was one of the measures to meet the emerging and expanding need of efficiently trained personnel in the field of agricultural education to boost agricultural production. "Such personnel can obviously be provided only by the universities specializing in agricultural research and teaching."

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4 Ibid., p. 84.
5 Ibid., p. 84.
6 Ibid., p. 84.
7 West Pakistan Agricultural University, First Year (Lyallpur: The University), p. 5.
In the four years of its existence, the University besides developing the complicated organizational structure of a university with its statutory bodies and common services has established forty teaching and research departments pertaining to various agricultural and allied disciplines under five Faculties, one Division and one Institute. Organizational chart given as Appendix I provides more information about the statutory bodies and teaching departments relating to their administrative and organizational set up as stand today.

The Institute known as Institute of Teacher Training, Extension and Short Courses presently consists of three departments. The departments are the Department of Teacher Training, the Department of Extension and the Department of Short Courses. The Department of Teacher Training is primarily responsible for the education of agriculture teachers and is destined to play an important part in the future.

One of the important functions of the University is to train teachers in the field of agricultural education. This is being attempted in three ways; viz., (a) training of postgraduate students in agricultural education at M.Sc. level, (b) training of graduate students at B.Sc. level, by allowing them a major in agricultural education, and (c) instituting special training for school teachers, deputed to the University by the Provincial Department of Education.8

The Commission on National Education while outlining the objectives of agricultural education at college level emphasised that one of its

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8 Ibid., p. 29.
objectives is to produce graduates who will return to serve "as teachers of agriculture in the secondary schools."9

Statement of the problem

The Department of Teacher Training at Lyallpur is in initial stages of its development. Destined to play an important role, it should be guided by a program which has been systematically and comprehensively developed. Such a program is not available at present. Therefore, the study was designed to develop a suitable program for the preparation of agriculture teachers at West Pakistan Agricultural University, Lyallpur, which should include such areas as (1) selection and recruitment, (2) development of a curriculum for the prospective teachers of agriculture, and (3) the nature and amount of field experiences including student teaching.

Importance of the problem

In order to appreciate the importance of the problem, it seems appropriate to look into a brief history of teaching of agriculture in secondary schools. Agriculture has been taught for the past fifty years in some parts of West Pakistan. It might also be relevant to briefly discuss the organization and administration of secondary schools as well as teacher training institutions and the facilities available for the education of agriculture teachers in West Pakistan.

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Organization of secondary schools

At present, school education in West Pakistan is almost divided into three main stages, viz.: primary, middle and high. Primary or elementary stages consist of first five grades, middle stage is composed of further three grades and high stage covers ninth and tenth grades.

With regard to administration, the secondary schools can be divided into three categories:

**Government or public schools.**—These schools are completely financed and administered by the Government Education Department. With a few exceptions, these schools have better facilities as compared to other two categories.

**Local body schools.**—Local body refers to municipal committees or district boards. The schools belonging to these bodies have dual control of local body concerned and the Government Education Department. Although major share of finances is contributed by the local body concerned but government also contributes some share. Generally these schools are better than privately managed schools with regard to facilities.

**Private schools.**—These schools are managed by local private managing bodies with a very little indirect control by the Government. Most of the expenditure on the schools is financed by the managing body from its sources with small contribution from the Government. Generally these schools do not provide as adequate facilities as schools falling in the other two categories.
However, both the local body schools and the private schools must be recognised by the Provincial Education Department in order to function legally. One of the purposes to recognize is that the school should be in a position to provide minimum facilities required for the proper functioning of the school. However, many times provisional recognition is given for a year or two even if minimum adequate facilities are not provided by the school but promises to do so within the period of provisional recognition. Provisional recognition can further be extended if the school shows some promise and there is some evidence that better facilities would be forthcoming.

Teaching of agriculture in schools

Teaching of agriculture in secondary schools has been attempted since the beginning of the present century. Systematic efforts were, however, made in 1917 and 1918 when two All India Conferences on agricultural education were held and made certain recommendations to the Provincial Governments to start teaching of agriculture in schools. But "about 50 high schools already taught agriculture..."\textsuperscript{10}

Therefore, this was although first major systematic attempt but not the first attempt to introduce teaching of agriculture in high schools. It is difficult to say that the objective of agriculture teaching in high schools before or after this major attempt was vocational. As

\\textsuperscript{10} Tanweer Ahmad Lodhi, "History of Agricultural Education in Pakistan," Institute of Teacher Training, Extension and Short Courses, West Pakistan Agricultural University, Lyallpur, 1964, p. 9.
a matter of fact the conference recommended that it should not be purely vocational. The conference observed:

Most of the students who go through a high school course of agriculture would probably do so with the intention of qualifying themselves for a degree in science or agriculture. Therefore, the agricultural teaching of a high school must not be purely vocational... It must be optional and it should aim at turning out men who, even if they do not adopt practical agriculture as their means of livelihood, would still have the ability and interest to diffuse sound agricultural knowledge.11

Therefore, the conference recommended for high schools a course of theoretical teaching accompanied by some practical training, and that all students in agricultural classes of high schools should spend a reasonable number of their study periods in practical work on land and in observing agricultural processes and experiments practically demonstrated on land. If some of the threads are joined together, it is discernible that the aim of agricultural education as recommended by the conference was prevocational.

The conference was of the opinion that the system of agricultural education in secondary schools recommended by it would be very valuable in leading a student up to a point from which he could either become a practical farmer or go on for a university degree. If he preferred the former alternative, it would be open to him to proceed to Lyallpur or some other similar institution to finish his education as a practical farmer.... Thus the system recommended by the conference intended to avoid the pitfall of rendering an agricultural student unfit for anything but the life of a farmer.12

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11 Ibid., pp. 9-10.

12 Ibid., pp. 10-11.
Whereas the teaching of agriculture in high schools in some parts of West Pakistan continued in more or less in the form described above; in other parts of West Pakistan, teaching of agriculture was not attempted until 1960.

The present status of the subject of agriculture can be traced back to 1960 when curriculum for secondary schools was worked out on national level in pursuance of the recommendations of the National Commission on Education. The present position being that each student in high classes (9th and 10th) is required to select a group in addition to compulsory subjects. The groups available at present are humanities group, science group, commerce group, industrial arts group, home economics group and agriculture group. The compulsory subjects are Urdu or Bengali, English, Physical Education and Manual Work. A student who selects agriculture group has to study physics, chemistry, general agriculture including soil science, elementary botany, horticulture and gardening, elementary zoology, animal husbandry and fisheries and mathematics or a paper carrying 100 marks from any other group.13

**Organization and administration of teacher training institutions in West Pakistan**

The teacher training institutions in West Pakistan can generally be classified in two categories. One category consists of Training

Colleges and University Departments of Education and the second category consists of normal schools. Normal schools as well as training colleges and universities are generally financed from public resources. Training colleges and normal schools are also usually administered by the West Pakistan Education Department. In case of universities, the Governor of West Pakistan heads each university as its Chancellor. He nominates the members of the Syndicate which is the governing body of the university. The Vice Chancellor is the principal academic and executive officer of a university.

Under the present setup and organization, an agriculture teacher who is considered competent to teach agriculture in ninth and tenth grades should be trained either in a college or a university. But facilities for the training of agriculture teachers at this level have never been provided in West Pakistan although some attempts as discussed already, were made to teach agriculture in ninth and tenth grades - "It is apparent that facilities have never been provided for the training of agriculture teachers for high classes."

At present the only institution in West Pakistan which offers facilities for the training of agriculture teachers for grades nine and ten is the West Pakistan Agricultural University, Lyallpur. The Department of Teacher Training at the University offers three programs at present.

1. One year program leading to a B.Ed. degree after B.Sc. (Agri.).

16 Ibid., p. 20.
2. Offers major in agricultural education at the first degree level.

3. Program leading to M.Ed. (Agric.). This is about one year course after the completion of one of the above courses.

The department which is still in initial stages of development was created in November, 1963. It has five members of teaching staff at present.

Purpose of the study

The study was made in an effort to secure suggestions for improving the program of agriculture teachers training at Lyallpur from the programs in selected institutions in the United States.

It was not the purpose of the study to make evaluative comparisons of the professional programs of Lyallpur and the United States. The purpose was to study the programs for the preparation of agriculture teachers in selected institutions in the United States and then to suggest certain modifications, changes, and improvements in the program now available at Lyallpur. The main criterion was that the improvements suggested should be feasible, practicable, and relevant to the conditions available in West Pakistan.

Specific objectives

1. To assess the need of selection and recruitment practices and offer some suggestions for West Pakistan Agricultural University, Lyallpur.
2. To propose framework of curriculum for the education of prospective agriculture teachers at the University.

3. To recommend the nature and amount of field experiences including student teaching.

4. To assess the need for placement, follow-up and inservice education and offer some suggestions.

5. To assess the suitability of the proposed program of pre-service education of agriculture teachers at Lyallpur by having members of a jury react to this program.

Basic assumptions

It is assumed that --

1. The program of teacher training at Lyallpur could be improved and the improvements could be suggested on the basis of a study done in the United States.

2. The study of the programs of ten selected Departments of Agricultural Education would provide some implications for the suggested program for Lyallpur.

3. Instruments could be developed to collect required information from the ten departments on related aspects of teacher training program to supplement information obtained through other sources.

4. The proposed program would be significant for the University at Lyallpur and the West Pakistan Government in the future planning and programming of agricultural education program within West Pakistan.
Method of study

Dr. Robert E. Taylor, Director, Center for Research and Leadership Development in Vocational and Technical Education, The Ohio State University and Dr. Duane Neilsen of the U. S. Office of Education were asked to identify ten Departments of Agricultural Education in the United States which could give the writer certain ideas and insights about the education of agriculture teachers for suggesting improvements in the existing program at Lyallpur. The two gentlemen were asked to do so in view of their official activities extending over the whole nation. It was thought that in view of the nature of their duties they were in a better position to do so.

The two gentlemen agreed on the following ten Departments of Agricultural Education of the following institutions:

1. The Ohio State University, Columbus, Ohio
2. The University of Illinois, Urbana, Illinois
3. The Colorado State University, Fort Collins, Colorado
4. The University of California, Davis, California
5. The California State Polytechnic College, San Luis Obispo, California
6. The North Carolina State University, Raleigh, North Carolina
7. The Iowa State University, Ames, Iowa
8. The Pennsylvania State University, University Park, Pennsylvania
The programs of those ten departments were closely studied through the printed material available to the writer. The aspects studied mainly included selection and recruitment, curriculum, and field experiences including student teaching. Some attention was, however, given to placement and follow-up, and inservice education practices. It may, however, be pointed out that those aspects were not studied in isolation nor observations were limited to only those aspects. Other relevant and related aspects were also studied. It was felt that sufficient information was not available on all of those aspects from printed material. Therefore, an instrument was developed to collect further information from the ten departments to supplement the information already available from the printed material. The instrument is given in Appendix II.

In order to gain further insight into the programs of those departments, each of these was visited for a day or two and discussions were held with the faculty members available at that time in the department. The instrument mentioned above was sent to the departments beforehand with the request that it might be made available at the time of the visit of the writer. The information given in the instrument was further discussed at the time of the visit. Some of the pilot programs, student teaching centers and classrooms were also visited. The covering letter sent with the instrument is given as Appendix III and the itinerary is given as Appendix IV.

The programs of the ten departments were analyzed critically to identify such characteristics and practices which were considered most
important and significant for West Pakistan Agricultural University at Lyallpur.

A list of sixteen guiding principles was compiled from the literature which it was thought could help in the evaluation of the existing program available at Lyallpur and these guiding principles could also be helpful in the planning and development of the program at Lyallpur. These guiding statements are:

1. The department should conduct a program of recruiting students in order to insure an ample regular supply of teachers of agriculture in West Pakistan.

2. Selection of students should be such that only those exhibiting qualities and competencies associated with good teachers are certified to teach.

3. Adequate facilities should be available to provide proper conditions and environment for conducting needed instruction.

4. All contacts with students, the nature of teaching, the learning situation, and the methods of teaching should be considered essential part of curriculum.

5. Opportunities and experiences should be provided students for the development of their personal, social and professional qualities.

6. Individual differences should be recognised and the curriculum should be flexible enough to meet specific individual problems and needs.

7. The teacher education program should be functional and practical rather than merely academic in nature.
8. Teachers of agriculture should have at least as much of the same kind of general education as is provided graduates who enter in other professions and occupations.

9. The pre-service education curriculum should enable students to acquire such attitudes, understandings, appreciations and knowledge of the physical and biological sciences as are essential in analyzing and solving agricultural problems.

10. The curriculum should enable students to acquire such technical knowledge and skill in plant and soil sciences, animal science, agricultural economics, rural sociology, and agricultural mechanics as are necessary to initiate and promote a good program of agriculture.

11. The prospective teacher should have a thorough knowledge of the learner and the learning process and some introduction to methods and materials and curriculum organisation.

12. The prospective teachers should have some minimum period of student teaching under typical conditions under competent supervision, as is needed to develop initial confidence and competencies required to plan, teach and conduct a good program of agriculture and to apply theoretical knowledge to actual teaching situations.

13. Even the best possible pre-service educational program cannot produce beginning teachers who are fully competent in all respects of their work. Therefore, efficient and regular follow-up program should be provided.

14. Personnel of the teacher education institutions and government departments of education should share responsibility of inservice
education including processing and making available teaching aids and instructional materials.

15. Teacher education institutions should make provisions for conducting research essential to the program of vocational agriculture and agricultural education.

16. Teacher education institutions should cooperate with regional, provincial and national organizations, groups and individuals concerned with the welfare and promotion of education and agriculture.

17. The Teacher Education Department should make provisions for continuous appraisal of changes and for making adaptations to meet changing conditions.

These statements were submitted to a jury of five members for their reaction and suggestions. The jury also reacted later to the proposed program. It was thought that these statements could also assist members of the jury to evaluate the proposed program. The members of the jury were selected on the basis of their familiarity with the programs and conditions both in the United States and Pakistan. All the members of the jury were directly or indirectly associated with the education of agriculture teachers in Pakistan.

These were:

Dr. C. Oscar Lorcan, now Associate Professor of Agricultural Education at Washington State University, Pullman, Washington, was advisor in the Department of Teacher Training, West Pakistan Agricultural University, Lyallpur.
Dr. John B. McColland, now Professor of Agricultural Education at
Iowa State University, Ames, Iowa, was adviser agricultural education
in East Pakistan Education Extension Centre.

Dr. Neil O. Snoep is now adviser in the Department of Teacher
Training, West Pakistan Agricultural University, Lyallpur.

Dr. Dorey F. Davy is now adviser agricultural education in East
Pakistan Education Extension Centre.

Dr. S. M. Noor is specialist in agricultural education in East
Pakistan Education Extension Centre.

Limitations of the study

1. The study was limited to the development of a program for the
West Pakistan Agricultural University, Lyallpur or under similar con-
ditions elsewhere.

2. The study was based largely upon information that was obtained
by mailed questionnaires, printed material, and personal observations,
interviews and discussions to the extent it was practicable.

3. The validity of the study was largely limited to the ability
and capacity of the members of jury to react to the proposed guiding
statements and the program.

4. The study was mainly limited to these aspects of teacher edu-
cation program vis-à-vis: selection and recruitment, curricula, field ex-
periences including student teaching. Some attention was also given
to placement, follow-up, and the role of the Department of Teacher
Training at Lyallpur in the promotion of inservice education program
for agriculture teachers.
Organization of the study

The study is organized and presented in six chapters. The first chapter deals with such background factors and information which have relevance for understanding and appreciating the implications of the study in addition to discussion about the "mechanics" of the study. This chapter also includes sixteen guiding principles, mention of which has been made earlier.

The next four chapters deal with different aspects of teacher education program. Accordingly, the second chapter deals with selection and recruitment, the third discusses curricula, the fourth includes field experiences and student teaching, the fifth chapter discusses placement and follow-up procedures and the role of the Department of Teacher Training at Lyallpur in the promotion of inservice education program.

All these four chapters are organized in a similar way. Each chapter first discusses the importance of the topic under discussion along with review of literature. This is followed by the description of procedures and practices followed at West Pakistan Agricultural University, Lyallpur, and the practices and procedures available in the selected institutions in the United States.

The description of procedures and practices both at Lyallpur and in the United States leads to examining the external and internal limitations in the implementation at Lyallpur of these factors found in the selected institutions in the United States if any. The above discussion leads to certain conclusion which is followed by a recommendation. Each of these chapters concludes with the discussion on
the reaction of the members of the jury and then finalisation of the proposal regarding that chapter.

In order to give an overall view of the recommendations made in different chapters, summary of conclusions and recommendations are pulled together in the sixth chapter.
CHAPTER II
SELECTION AND RECRUITMENT

This chapter deals with one of the important aspects of teacher education program, i.e. selection and recruitment. It is maintained that both selection and recruitment are related intimately; therefore both are treated in the same chapter. "Because recruitment is so closely associated with pre-service selection, the subject is also treated in this article."¹

Selection can be made at different times while the student is pursuing his educational program in a college or a university. The first selection is generally made when a student seeks admission in a college or a university. Then another selection is made when a student is admitted to professional programs. Selection for the purpose of this study refers to selection made when the student is admitted to professional program.

Rationale

The following guiding statement relating to selection was submitted to the members of the jury and received full support.

Selection of students should be such that only those exhibiting qualities and competencies associated with good teachers are certified to teach.

It might be pointed out that this statement assumes selection at the time of entry to the program as well as later selections.

It is often said that the success of any teacher education program is determined to a large degree by the quality of students selected to undergo this program, and in turn the whole system of education is closely related to the quality of teachers available for teaching.

This point of view is supported by the following statement.

It has been well said that no system of education is better than its teachers. We have stressed throughout the report their pivotal role, and we need only say here, though we say it with force and without reservation that none of the reforms we are proposing will succeed unless we are able to recruit to the teaching profession at all levels men and women of the highest abilities... It is obvious that education will fall short of these goals to the extent that our teachers fall below the standards we expect of them.2

Many persons which include some parents and university personnel argue that selection at the time of admission to professional preparation is undemocratic and unjust to students and to their parents, who made sacrifices to send their children through the initial stages of university education. They maintain that high mortality in the high school, selective admission to the university and survival in the competition of the first two or three years, should suffice as selective

factors and deemed sufficient. Many professors might particularly challenge selection when there exists no adequate measures of teaching success. They argue that how can a university attract superior students where there is uncertainty regarding admission into a professional program they would like to pursue. Many persons would also maintain that since no satisfactorily valid instruments and tests for making selection are available, it will be unjust to give such importance to selection. Such arguments are more common and frequent when selection practice is first incorporated in any program.

Many others might argue that some sort of selection is not only desirable but necessary but all of them may not agree on how to do it.

Some evidence in support of selection was cited by Stout.

Recent evidence supports the hypothesis that in the absence of selective admission policies for teacher education, few persons desire to become teachers, a lower percent of entrants completes the program, and of those who complete it, fewer enter teaching.3

Supporting the selection, Stout further emphasized:

Much has been done in the development and revision of curricula designed to prepare teachers and to increase the standards of preparation both quantitively and qualitatively. But full value cannot be achieved from these developments until program of selecting candidates for teacher education are also more adequately developed. Teaching must become a profession worthy of its high

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responsibilities and must attract to it enough capable young people to staff in schools... There must be careful consideration of who should enter the profession as well as of what makes up the best program of preparation.4

Stout conducted a study which covered 865 institutions generally accredited four years institutions that prepared teachers in the United States and the territories. The study indicated that half the total number of institutions preparing teachers employed one or more selective procedures for admission to teacher education and continuance in the program.5 It was reported in the Encyclopedia of Educational Research that "Although research does not furnish a scientific basis for pre-service selection of teachers, a large number of teacher training institutions use some form of selective admissions or of selective retentions or a combination of both."6

Although some kind of selection might be as old as the program of teacher education itself yet more interest seems to have been shown since the beginning of the present century. "With the turn of the century, interest in teacher selection began to be reflected in educational literature, but research was slight and sporadic."7 It seems that selection practices received more incentive in thirties of the present century which might be the result of the depression.8

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4 Ibid.
5 Ibid., p. 301.
7 Ruth A. Stout, op. cit., p. 301.
the depression the supply of teachers far exceeded the demand. Many institutions at that time planned and some put into effect selective procedures. Many teacher education institutions incorporated stricter measures of selection. Syracuse University was one of such institutions. Their philosophy and rationale is reflected in the following statement.

More important than organization is the adoption of a plan of effective selection. Even if every other phase of an institution program were superlative without the rigorous selection of candidates, efforts to improve teacher education would still be largely futile. Only students of fine personality and real ability should be enrolled as candidates for teaching. On this part of the program, there can be no compromise, for on this point depends the quality of the schools and ultimately the level of American culture.

In spite of the criticism that pre-service selection of teachers is not compatible with democratic ideas of education - the statement which may not be acceptable to many - four considerations seem to support the introduction of selective measures in America. These are well summarized as follows:

1. The social importance of the work of the teacher justifies seeking persons who would be best qualified for entrance into the profession as well as excluding those persons who are believed to be unfit for its performance.

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2. School employing beginning teachers expect the higher institutions which prepared these teachers to have in operation, as one important phase of their program, plans of recruitment and selection.

3. The analysis of teacher supply and demand data clearly indicate the desirability of selection.

4. Increased registrations have forced many institutions to adopt the quota concept. 10

Factors considered in selection

In historical context, different persons and institutions have emphasized different factors in the selection of prospective teachers; and there has been less than consensus as to how much weight should be given different factors. The factors to be considered in the pre-service selection are closely related to the factors considered relevant and important in the prediction of teaching success. At present there appears less than complete agreement as to the criteria and an instrument for predicting the teacher's effectiveness and even as to what is successful teaching. This position was reflected in 1950 in supported by the following statement:

A valid and reliable criterion of teaching success had not been found, the factors conditioning success in teaching are not definitely known, and a satisfactory technique of investigation for applying the criterion and the factors has not been formulated. 11


11 Ibid., p. 1394.
It seems that position until 1960 has not improved much, which might be construed from the following statement:

More than half a century of research effort has not yielded meaningful, measurable criteria around which the majority of nation's educators can rally. No standards exist which are commonly agreed upon as the criteria of teacher effectiveness.  

Some of the factors which hold the attention of the educators as considerations in the selection of prospective teachers and consequently employed to do selection are reflected in the following statement which reflects the recommendations of the Curriculum Committee of the School of Education, Syracuse University.

Physical stamina necessary for long hours of strenuous physical and mental activity, should be free from contagious and infectious diseases, and exhibit physical vitality, emotional stability, social and academic competence. The mental abilities should be such as to render the teachers capable of civic and educational leadership among professional men as well as laymen. Prospective teachers should have an abiding interest in reading and discussing every day occurrences in fields such as politics, economics, international affairs, social relationships, etc., should be sufficiently skilled in oral and written expression so that they may accurately set forth their own thoughts and aid others to develop the ability to do likewise. They should also

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be capable of understanding and extending the psychological, philosophical and social bases of education.\(^\text{13}\)

It was reported in the *Encyclopedia of Educational Research* that

Prior to granting entrance to the period of professional specialization or to school or college of education, the factors ordinarily considered include scholarship in college courses, pattern of college courses completed, scores earned on examinations; English usage tests, contemporary affairs examination; health; speech, and personality rating following interviews.\(^\text{14}\)

Fridian conducted a study of characteristics of prospective teachers in 1961 by means of a self rating scale. The study, done with the cooperation of 182 teacher-education students, agreed upon ten personality factors contributing to teacher's success. These ten factors were intelligence, social intelligence, academic achievement, character, personality, communication, motives for teaching, physical appearance, sense of responsibility and success in previous experience with children.\(^\text{15}\)

Giosti investigated the relative importance of curriculum experiences in high school for prediction of academic success in the College of Education at Pennsylvania State University. It was found that


\(^\text{14}\) W. S. Monroe (ed.), *op. cit.*, p. 1393.

grades earned in high school English were a better predictor of grades earned in college than five other subject matter variables. 16

Stout concluded as a result of her study that factors considered for admission to teacher education were emotional stability, moral and ethical fitness, general intelligence, demonstrated ability to work with children and professional interest and motivation. 17

Conant argued that intelligence should be the major factor in the selection of prospective teachers. Although he sympathised with the argument that there was no close correlation between teaching ability and intellectual ability (as measured by grades in courses or scholastic aptitude test) yet, he argued "but I still maintain that we should endeavor to recruit our teachers from the upper third of the graduating high school class on a national basis." 18

Authors of New Horizons for the Teaching Profession advocated the following as the minimum criteria essential in the selection of all persons for teaching.

1. Keen intellectual ability.

2. Interest, abilities and values that give some assurance to the individual that he will find some satisfaction in a teaching career.

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3. Character, attitude, and action worthy of evaluation by pupils. Habits of thought, attitude, and values should fall within an accepted range of human behavior.

4. Ability to carry on work throughout the day each day. The teacher's physical and mental health must be sufficient to permit regular and effective teaching.

5. Possession of ability, interests and self direction appropriate to success in college and continuing development as a teacher, as a person, and as a scholar.

6. Evidence of having the probability of becoming broadly educated and of having the desire and ability to secure a comprehensive knowledge of that which he would teach.

7. Ability to guide learning, to respond to the intellectual and effective state of pupils, and to control and give direction to learning activities.\(^19\)

National Commission on Teacher Education and Professional Standards also reported a study which indicated that

...it appears that for the purposes of admission to teacher education program previous academic record is evaluated by 87.8 per cent; physical fitness by medical examination by 70.4 per cent; emotional stability by 81.5 per cent; speech and voice through a specific test by 47.1 per cent; English proficiency through writing sample by 60.8 per cent; personal-social-ethical fitness through multiple ratings by 74.4 per cent.\(^20\)


\(^{20}\) Ibid., p. 188.
It might be clear from above references to different authorities and research studies that there is some difference as to what factors should be considered in the selection of prospective teachers but still there are some factors which have been repeatedly emphasized at different times by different authorities or substantiated by research findings. It seems that even more difficulty lies in finding a valid criteria of predicting success and how to apply this criteria. This is well stated in the following statement.

More serious, however, is the lack of verified knowledge concerning a criterion for judging teaching efficiency and concerning the factors which condition success in teaching. Following the determination of a criterion and of the factors, it will be necessary to develop a technique of investigation for finding out whether or not the factors are possessed by students who wish to enter teacher education institutions or who are already attending such institutions, if pre-service selection is to be exercised on a scientific basis.21

Recruitment

Recruitment for the purpose of this study refers to a planned program for discovering potentially desirable and interested candidates for pre-service teacher education.22 As the competition for talents is becoming more and more keen and as demand for teachers is increasing, more and more efforts are expended to recruit candidates for pre-service teacher education. Stiles and others referring to existing

22 Adapted from W. S. Monroe (ed.), op. cit.
practices for the recruitment, selection and admission of prospective teachers argued that many interests prevailed among institutional faculties. They reflected concern for such matters as "teacher shortage, standards for teacher certification, the quality of teachers and job opportunities, professional standards, and the welfare of the members of the teaching profession."\(^{23}\)

The following statement relating to recruitment was submitted to the members of the jury which received full support.

The department should conduct a program of recruiting students in order to insure an ample supply of teachers of agriculture in West Pakistan.

Many might argue against efforts calculated to recruit prospective teachers on the basis that this practice does not give fair chance to the students to make thoughtful judgment based on independent and objective information and evidence with "free" mind but others would take the position that recruitment is not something "alluring" the students or "buying" the student to the profession, but provide him information about not only the opportunities and prospects available but standards to be achieved and requirements to be met to make entry into the profession. Equipped with this information the candidates can decide for themselves about the course they would like to pursue. It is, however, assumed here that the candidates have access to similar information about other professions and to professional advice.

The practice of recruitment not only provides, therefore, a logical basis but is also supported by some research evidence. Herlinger reported "that after a short program of counseling aimed to correct erroneous impressions with respect to teaching, 37 students in a graduating class of 258 entered teacher training." 24 Emphasizing importance of recruitment, Bender maintained as follows:

One of the most urgent needs for the future development of vocational agriculture is the recruitment of an adequate number of persons who have the potential of becoming competent teachers. Vocational agriculture has never been and never will be any more effective than the teachers. The teacher is the key person in the success or failure of the program. 25

Practices available in the selected
Departments of Agricultural
Education in the United
States

The ten Departments of Agricultural Education selected for study in the United States had some common as well as different practices with regard to selection and recruitment. The practices as reported in the survey forms (developed for this purpose) by respective departments in response to the following question are given in the following table.

Q. What qualifications are required of students selecting agricultural education as major beyond college or university requirements?


TABLE 1
Selection and Recruitment Practices in Ten Selected Departments

<table>
<thead>
<tr>
<th>Practices Followed</th>
<th>Number of Departments Following</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experience in farming and/or other agricultural experience</td>
<td>7</td>
</tr>
<tr>
<td>Grade point average</td>
<td>8</td>
</tr>
<tr>
<td>Aptitude, interest, personality and character through standardized tests</td>
<td>1</td>
</tr>
<tr>
<td>Physical fitness</td>
<td>1</td>
</tr>
<tr>
<td>Interviews with the departmental committee</td>
<td>3</td>
</tr>
<tr>
<td>Fundamental skills including speech efficiency</td>
<td>3</td>
</tr>
</tbody>
</table>

Practices available at West Pakistan Agricultural University, Lyallpur

Under the available facilities, two kinds of programs are projected in the field of agricultural education at present at Lyallpur. Under one program, candidates after receiving their Bachelor's degree in agriculture are admitted to Master of Education (Agriculture) degree program. At least two years are required for the completion of this program. However, after the successful completion of first year, Bachelor of Education (Agriculture) degree is conferred.

Under the second program the students in the fifth and last year of their study toward Bachelor's degree in agriculture can elect agricultural education as major. It may, however, be pointed out that
the duration of the course for the Bachelor's degree in agriculture is of five years, to which students are generally admitted after they have passed secondary school examination. This is a public examination given after ten years of schooling. Therefore a student would normally take fifteen years to qualify himself for Bachelor's degree in agriculture.

**Selection and recruitment practices**

The University puts forth rules, regulations regarding admission, recruitment, outlines of courses, methods of examination and most of the administrative and academic matters in University Calendar. Going through it, it looks obvious that nothing has been said about recruitment policy of the University. However, according to the personal knowledge of the writer, applications for admission are invited from those who want to get admission into the course and who are eligible under the conditions and qualifications through an advertisement in the national press. Conditions for admissions are, however, mentioned in the advertisement. The conditions for admission to this course as given in the Calendar are two:

1. A candidate for admission to the Master of Education (Agriculture) courses must have passed the Bachelor of Science in agriculture examinations or other allied disciplines from a recognised university.

2. Every candidate selected for admission shall be required to obtain a certificate of physical fitness from the Resident Medical Officer of the University.26

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Under the agricultural education major program, student in the last year (fifth year) of his course for Bachelor's degree in agriculture is entitled to elect agricultural education as major. No conditions or qualifications are imposed at this stage.\footnote{Ibid., p. 66.} However, there are three conditions which are imposed at the time of admission to the University. These conditions are:

1. Candidates for admission to the First Year of Bachelor of Science (Honors) in agriculture course must have passed the secondary school certificate examination of the Board of Intermediate and Secondary Education, Lahore, with Science or Agriculture Group, or any other examination recognized as equivalent thereto.

2. The candidate must not be more than 20 years of age on the first of June of the year of admission, provided that the Vice Chancelor may relax this condition in exceptional cases.

3. Admission is subject to physical fitness to be certified by the Resident Medical Officer of the University.\footnote{Ibid., p. 17.}

Conclusions and recommendations

Only one of the ten selected departments in the United States does not require any qualifications for admission to professional part of the program beyond college or university requirements. One other department, however, does not specify any condition until student teaching in the senior year. The rest of the eight selected departments specify certain conditions as prerequisite for admission into agricultural education major.
Out of the eight departments which prescribed certain qualifications, seven required that the candidate either should have two to three years experience in farming or other agricultural pursuits or acquire such experience before graduation. Seven departments also required minimum academic standards in the form of grade point average which ranges from 2.25 to 2.5 or 'C' average. For practical purposes both of which might be taken as the same. The ninth department required 'C' average at the time of student teaching in the senior year. The tenth department did not specify any such condition.

Other forms of qualifications reported by some departments included interview with the departmental committee, speech efficiency, physical fitness, and that the student must not be on probation for more than one term after attaining sophomore standing.

Two questions seem to be relevant here. Should there be any qualification or condition at this stage at Lyalipur? If yes, what factors should be considered at the time of making selection.

As those involved in selection apply rules and regulations to make decisions as to the suitability of the candidate, they become aware that although errors in making selection may be reduced, they can never be eliminated completely. These errors are generally of two types. One type eliminates those students who, if given an opportunity could succeed in college and teaching. Under the second type the persons who will fail or hardly succeed in teacher preparation or in teaching are admitted. With either type of error both the individual and the society lose something, but the loss may be particularly greater in the
second case as the individual spends his college years preparing for a career that will not yield satisfaction, and, from one to thirty years, as students in his classes reap the effects of poor instruction. In the doctoral study which covered 865 teacher education institutions, five-sixth believed there should be some selection. Different types of jobs have their own unique requirements, functions, and responsibilities which make certain individuals more suitable than others. In view of the above evidence, it is recommended that there should be a selection at the time a student elects agricultural education as major.

If it is granted that some selection seems advisable, it leads to second question. What factors or criteria should be considered and how should it be administered? Many factors have been and are still considered in the selection of students for teacher education program. Most frequently these include emotional stability, intelligence, physical fitness, moral and ethical fitness, ability to work with children.

The methods of evaluation and the ways in which criteria are administered vary in different situations. In the ten Departments of Agricultural Education the most frequent requirements were agricultural experience for two or three years and at least 'C' grade point average. Physical fitness has not been reported by nine out of the ten departments.

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29 Ruth A. Stout, op. cit., p. 301.
Although most of the factors mentioned previously as considered
toward selection seem to be important yet valid tests and other methods
of their measurement are not available in West Pakistan. Therefore it
is recommended that the following should be included in the selection
procedure.

1. a. Physical fitness to be checked by medical officer.

b. Two years farm experience either as prerequisite to ad-
mission to professional program or the student should acquire equiva-
 lent experience before graduation through working in summers.

c. The department should also insist that the student has at
least 'C' or equivalent as minimum academic quality achievement.

d. Interview with the Departmental Committee.

In addition to other factors, the Departmental Committee may
evaluate the prospective agriculture teacher in regard to such per-
sonality factors as interest, aptitude, attitude, general intelligence,
emotional stability, and ability to work with people during the inter-
view.

2. At present neither the Agricultural University, Lyallpur,
pursues systematic practice of recruitment nor do individual depart-
ments. The Department of Teacher Training at Lyallpur goes along with
the University in not following any recruitment program. But it is
recommended that the department in cooperation with the University
authorities should pursue systematic, regular, and forceful program of
recruitment. This seems very necessary in view of the recency and
newness of the program of agricultural education. Special efforts will
have to be made to apprise prospective students and their parents of
the requirements and opportunities available with the program. There
seems to be a lot of demand for the trained agriculture teachers.
There are hundreds of high schools in the rural areas. It is difficult
to say how many of these will require agriculture teachers, but in
view of the fact that, at present Agricultural University is the only
institution which prepares agriculture teachers, it looks tremendous
job to meet the requirement even if half of the number of these schools
start teaching of agriculture. In view of these circumstances, it
looks almost necessary that effective program of recruitment should be
instituted to insure ample supply of good teachers.

There were variations in recruitment practices followed by the ten
selected Departments of Agricultural Education in the United States.
But most commonly followed practices included involving of agriculture
teachers, effective communication with counselors in the secondary
schools, development and distribution of printed material explaining
prospects, challenges and opportunities in the profession, inviting
prospective agriculture teachers and their parents to attend recruit-
ment meetings on the campus and to visit facilities. Some of these
activities might be useful for initiating recruitment program at
Lyllpur.
Reaction of the jury

All the jurors agreed basically to all the recommendations made in regard to selection and recruitment. One of them, however, wanted to equate 'C' average with the system of grading in Pakistan. It seems difficult to equate exactly, but in the opinion of the writer 'C' average will approximately be equal to second division in Pakistan.
CHAPTER III
CURRICULUM

Curriculum has been defined in different ways by different authorities at different times. Some have viewed it more comprehensively and broadly and others see it as narrower and more specific. On the one hand it is defined as all the experiences that a learner has under the guidance of the school and on the other many restrict the use of the word curriculum to only formally organized courses. In the former sense, it generally includes all the ways and influences used in the school to acquire new behavior or modify, maintain, or eliminate present behavior.

Looking through the literature, it becomes almost obvious that the scope of the curriculum has been widening as schools are becoming more and more able to provide better facilities and more effective means through improved knowledge and techniques to effect change in the behavior of the students. But needless to say the school has to draw a line somewhere to separate those functions which it should take over and those which should be left out because either it cannot perform effectively in view of its limited resources or because other social institutions are in a better position to carry on those responsibilities. It may, however, be indicated that such a line will neither be neat and
clear nor it will be permanent. It can be adjusted as the original considerations continually change and require readjustment.

The curriculum for the purpose of this study will be limited to all the organized courses and systematic groups of courses or sequences of subjects required for graduation or certification. However, in view of the importance of field experiences and student teaching, the following chapter is completely devoted to this aspect of the curriculum.

The aspect of the curriculum treated in this chapter has been divided into four parts including general education, technical education or the area of specialization, the professional education and the electives. It may, however, be pointed out that these do not reside in separate and independent compartments and all of these have certain goals in common. Viewed in this context, general education contributes to the area of specialization as it helps the student to discover relationships between his teaching fields and other fields of knowledge. Many general education courses might have prognostic and orientation value. Similarly, professional education increases insight concerning the prospective teacher's own behavior and that of others; and areas of specialization give wider meaning and relationship to general education.

General education

In a review of some of the pertinent literature, it seems reasonable to maintain that there is much consensus as to what should be the
purposes of general education. In the *Encyclopedia of Educational Research* the purposes of general education were outlined as follows:

The purposes of general education are to prepare men and women for a satisfying personal life, citizenship in a free society by acquainting them with our common cultural heritage, by helping them to integrate the subject matter of related disciplines, and by developing skills, abilities, attitudes, and values which will enable them to cope more effectively with their personal problems and those of society in which they live.¹

Johnson defined general education as "that part of education which is concerned with the common knowledge, skills and attitude needed by each individual to be effective as a person, a member of a family, a worker and a citizen."²

The President's Commission on Higher Education stated that general education should enable one to

a. develop for the regulation of one's personal and civic life a code of behavior based on ethical principles consistent with democratic ideas,

b. participate actively as an informed and responsible citizen in solving the social, economic, and political problems of one's community, state and nation,

c. recognize the interdependence of the different peoples of the world and one's personal responsibility for fostering international understanding and peace,

d. understand the common phenomenon in one's physical environment, apply habits of scientific thought to both personal and civic problems and appreciate the implications of scientific discoveries for human welfare,


e. understand the ideas of others and express one's own effectively,
f. attain a satisfactory emotional and social adjustment,
g. maintain and improve one's own health and cooperate actively and intelligently in solving community health problems,
h. understand and enjoy literature, art, music, and other cultural activities as expression of personal and social experience, and participate to some extent in some form of creative activity,
i. acquire the knowledge and attitude basic to a satisfying family life,
j. choose a socially useful and personally satisfying vocation that will permit one to use to the full,
k. acquire and use the skills and habits involved in critical and constructive thinking.3

Good defined general education as "(1) those phases of learning which should be the common experience of all men and women, (2) education gained through dealing with the personal and social problems with which all are confronted."4

Many writers view general education and liberal education as conveying the same meanings and use these two terms interchangeably. Others view both of these terms differently and make the following distinction:

a. General education is a return to the original concept of liberal education which through proliferation of courses and

3 Chester W. Harris (ed.), op. cit., pp. 570-571.

compartmentalization into ever more disciplines, has become a form of specialization.

b. Liberal education in the face of rapidly expanding knowledge has come to emphasize facts and subject matter; general education is concerned with ideas and people.

c. Liberal education is broader, deeper and more intensive than general education.

d. Liberal education is reserved for bright students, whereas general education is for the less gifted - a difference of degree rather than of kind.

e. General education is liberal education with its matter and method shifted from its original aristocratic intent to the service of democracy.

f. Liberal education is restricted to a four year post high school period, whereas general education applies to all levels of education - elementary through graduate and professional schools and adult education as well.

g. Liberal education is oriented to development of the intellect; general education is concerned with the development of the whole personality in relation to society.  

Without much fear of oversimplification, it might be maintained that general education stresses preparation for the common activities of men and women as citizens, workers, and family members and is commonly

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5 Ibid., p. 570.
contrasted with specialized education, which aims at preparation for a vocation or profession. If general education program aims to prepare students for their responsibilities and activities which are common as human beings then this program should be the same for all students irrespective of their projected professions and vocations.

The following guiding statement was proposed and submitted to the members of the jury for reaction.

Teachers of agriculture should have at least as much of the same kind of general education as is provided graduates who enter in the professions and occupations.

Two of the members agreed with reservations. One of these two maintained that "if the last phrase should refer to teachers or teaching professions rather than 'professions and occupations'." The other reaction was "The limited observations of curricula here indicate that there is presently very little of what is generally called general education. For teachers of agriculture this must be balanced with the needs of technical agriculture and professional education requirements." The other three agreed completely.

It seems difficult to say what exactly is implied by the former reaction. But it seems that the reactor thinks that the application of this guiding statement should be restricted to the teachers and the teaching profession rather than other professions and vocations. It is still maintained that if this phase of education is to be titled general education and prepares for activities and responsibilities which men and women have in common then it should not be specific to different vocations and professions. The second reactor by agreeing
with reservations seem to have confused what should be available with what is available. His reaction will be more useful when the available practices at Lyallpur are discussed and analyzed. Therefore, it is still maintained by the writer that there is no need of making any substantial changes in the guiding statement.

Almost consensus on purposes of general education is not carried over to the ways and means to achieve these purposes. Some people think that general education can most effectively be attained by concentrating on all phases of individual personality - intellectual, social, physical, and emotional. Others think that the broad purpose of general education can be achieved by emphasizing intellectual processes generally by studying great books.

In advocating the reform of the entire system of higher education in this country, Adler, and through him, Hutchins, insisted upon a return to the classified unity of the medieval university in which the prescribed texts of the western traditions were studied for the purpose of discovering the principles of thought and morality which could be said to apply to all events, relations, and objects of the external world. 6

Doren argued that

The classics of our world, the great books, ancient and recent, in which the western mind has worked and played, are more essential to a college than its buildings and

its bells, or even, perhaps, its teachers; for these books are teachers from which every wise and witty man has learned what he knows.\(^7\)

On the other hand many others tie education closely with the social process. They believe that the content and method of general education should depend upon the particular society in which it takes place and take into consideration the needs of the pupils. Conant stated:

> Education is a social process, our schools and colleges neither operate in empty space nor serve identical communities...what may be highly satisfactory curriculum for one group of pupils may be highly unsuitable for another. And the difference is often not due to discrepancies in the intellectual capacities of the students but to the social situation in which the boys and girls are placed.\(^8\)

Whereas some place more importance on the study of cultural heritage to meet present problems, the other advocate that learning should be based on present day problems, of course, not neglecting the past for critical study. Again, some place more reliance on verbal sources of understanding to make important decisions whereas others see more value in actual participation by students in the life of their time, on and off the campus.

But the institutions following one philosophy or the other are not many. There are many which follow eclectic approach.

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The introduction of the eclectic system at Harvard in 1872 was the first mark of this change. What is now meant by the term "general education" as practiced at Harvard and, in one form or another, accepted as an accurate description by most other colleges, refers simply to the distribution of knowledge into the conventional four division and to the content of individual courses and the purposes for which they are taught. This purpose is stated as nonvocational, nonprofessional, and nonspecialist for cultivating a sense of values and for developing clear thinking and an understanding of the physical and social world, as well as an appreciation of the tradition of western civilization.9

The authors of the Harvard Committee Report argued as follows:

The true task of education is, therefore, to reconcile the sense of pattern and direction deriving from heritage with the sense of experiment and innovation deriving from science that they may exist fruitfully together as in varying degrees they have never ceased to be throughout western history.10

**Composition of general education area**

Different ways of selecting and organizing general education experiences are being tried. The survey course is one of the methods. "The most common type of survey is chiefly a condensation of the elementary courses in the various areas composing a field, usually presented a seriatiim by a group of specialists."11 Another method is the use of a special problems or issues approach. Some of the problems

9 Nelson B. Henry (ed.), *op. cit.*, p. 31.


which have been persistent in society generally serve as the basis for selection and organization of content. Still another method which is popular in some institutions is building of courses around the needs of the students.

Stiles and others presented two principles which can be helpful in organizing content of general education.

One of these is that general education must be representatively comprehensive. It must cover all the important areas of culture and human knowledge and human problems.

Secondly, the content of an effective program of general education must be selected, organized and taught with respect to its relationships with life.12

The general education area not only differs somewhat in nature and organization but also in its composition. The courses composing it generally fall into five groups - communication, social sciences, natural sciences, humanities, and personal adjustment. Stiles and others emphasized that general education should definitely include materials from each of the fields of (a) the physical sciences and mathematics, the biological sciences, history and social sciences, the humanities, and the fine arts.13 The authors of Harvard Committee Report recommended that the areas of the humanities, the social sciences, sciences and mathematics should be represented on general education.14

13 Ibid., p. 169.
14 The Harvard Committee Report, op. cit., p. 103.
The Commission on National Education thought that "the first year should include general courses in the humanities and social sciences for science students, natural sciences for art students, and the English language for all."\(^{15}\)

**Practices in teacher education institutions in the United States**

A study made by Gross in 1953 for American Association for Colleges for Teacher Education revealed that the majority of institutions indicated that the purpose of general education was the "development of the knowledges, skills, and abilities which are the common possession of educated persons as individuals and as citizens in a free society."\(^{16}\)

Stiles and others reported that the study conducted in 1950 covering 77 member institutions of AACTE indicated that at the time of the study 62.1 per cent of the institutions involved, concentrated the general education courses in the first two years. However, 81 per cent indicated a preference for spreading general education throughout four years.

A dissertation study made by Bronson covering sixteen interregional land grant institutions in 1963 at The Ohio State University showed


that the range of general education requirements was from 27 to 40 per cent. Another dissertation study conducted by Luster in 1954 at The Ohio State University covering institutions in the North Central Region of the United States indicated that 36 per cent of the pre-service curriculum was devoted to general education whereas the members of his jury thought it should be 37 per cent.

It was reported in the Encyclopedia of Educational Research that "some form of general education requirements, involving as much as 50 per cent of the degree requirements, is common in liberal arts colleges. Requirements of 30 to 40 per cent are found in teacher colleges." Conant recommended that 50 per cent of the time of pre-service teacher education curriculum should consist of general education.

In the ten selected Departments of Agricultural Education in the United States, the requirements in regard to general education varied from 27.5 per cent of the total requirements for graduation to 49.6

17 Clement Alphonso Bronson, "An Evaluation of Selected Aspects of Agricultural Education Programs in the Inter-Regional Land Grant Institutions of the United States." Dissertation, The Ohio State University, Columbus, Ohio, 1953.

18 George L. Luster, *Pre-service Curricula for Preparing Teachers of Vocational Agriculture in the North Central States.* Dissertation, The Ohio State University, Columbus, Ohio, 1959.


per cent. The average requirement for those ten departments was 39.2 per cent of the total requirements.

The total requirements as well as requirements for general education in the ten selected institutions are presented in Table 2.

**Practices available in Agricultural University, Lyallpur**

Titles of courses and even their outlines are not true indicators of the objectives of the course. There is no indication in the prescribed courses as to whether they are supposed to contribute to the area of general education, area of specialization or professional education. It has, therefore, been assumed that all courses which have been prescribed for all the students prior to starting their areas of specialization are taken to constitute general education area at Lyallpur.

Another difficulty lies in equating weights given different courses both in the United States and at Lyallpur because Agricultural University is neither operating on semester system nor on quarter system. In order to appreciate this difficulty and later conclusions and inferences, the following schedule at Lyallpur is presented.
TABLE 2

Total Graduation Requirements and General Education Requirements in Quarter Hours in the Ten Selected Institutions

<table>
<thead>
<tr>
<th>Name of Institution</th>
<th>Total Requirements</th>
<th>Area of General Education</th>
<th>Percentage of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorado State University</td>
<td>200.0</td>
<td>72.0</td>
<td>36.0</td>
</tr>
<tr>
<td>Iowa State University</td>
<td>200.0</td>
<td>66.0</td>
<td>33.0</td>
</tr>
<tr>
<td>University of Illinois</td>
<td>189.0</td>
<td>82.5</td>
<td>43.7</td>
</tr>
<tr>
<td>California Polytechnique</td>
<td>198.0</td>
<td>58.0</td>
<td>29.3</td>
</tr>
<tr>
<td>University of California</td>
<td>186.0</td>
<td>67.5</td>
<td>36.3</td>
</tr>
<tr>
<td>Michigan State University</td>
<td>183.0</td>
<td>84.0</td>
<td>45.3</td>
</tr>
<tr>
<td>Cornell University</td>
<td>180.0</td>
<td>49.5</td>
<td>27.5</td>
</tr>
<tr>
<td>Pennsylvania State University</td>
<td>198.0</td>
<td>90.0</td>
<td>45.5</td>
</tr>
<tr>
<td>North Carolina State University</td>
<td>205.0</td>
<td>102.0</td>
<td>49.6</td>
</tr>
<tr>
<td>Ohio State University</td>
<td>210.0</td>
<td>97.5</td>
<td>46.5</td>
</tr>
<tr>
<td>Average</td>
<td>194.9</td>
<td>76.9</td>
<td>39.3</td>
</tr>
</tbody>
</table>
Schedule for Undergraduate Classes for 1964-1965

First Session 17th August to 24th December, 1964
Midsession Recess 25th December to 3rd January, 1965
Second Session 4th January to 15th May, 1965
Annual Examinations 17th May to 15th June, 1965
Summer Vacation 16th June to 15th August, 1965

Schedule for Postgraduate (Graduate in America) Classes

First Term 17th August to 14th November, 1964
Recess 15th November to 22nd November, 1964
Second Term 23rd November to 20th February, 1965
Recess 21st February to 28th February, 1965
Third Term 1st March to 29th May, 1965
Summer Term 10th June to 10th August, 1965

Out of five years required for Bachelor's degree at Lyallpur, two full years are devoted to courses which have been assumed to be general education courses. If it is further assumed that students are almost required to carry the same load every year, then it is clear that general education is given 40 per cent of the total time. 21

Although as stated earlier, course titles and their outlines are not indicators of what the course will achieve or even supposed to achieve yet some indication is available from their titles and

21 The Calendar of the West Pakistan Agricultural University, 1964-65 (Lyallpur: The University), p. 66.
Therefore it seems advisable to give courses and their outlines which the students are required to take in the first two years.

First Year
1. English (Eng. I)
2. Mathematics (Math I)
3. Biology: General Biology, Botany, Zoology (Biol I)
4. Chemistry: General and Inorganic (Chem I)
5. Agriculture: Agronomy and Farm Operations (Agron I)

Second Year
1. English (Eng. 2)
2. Biology: Botany and Zoology (Biol 2)
3. Physics and Meterology (Phys 2)
4. Agriculture
   Paper A: Field and Fodder Crops (Agron 2)
   Paper B: Vegetable Crops (Hort 2)

Conclusions

An examination of the outlines of above courses as listed in Appendix E reveals to the writer that the assumption that courses taken during the first two years by all students as general education courses may not hold true. Two observations seem pertinent. One is that in these ten courses, all the areas traditionally thought to be contributing to the objectives of general education in the United States are

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22 See Appendix E.
not represented. These areas have been given in the previous section and are not repeated here. The other observation is that these courses are not meant to be general education courses as indicated from the outlines of these courses and subsequent courses in the later years of the students educational program. One of the jury members who is working at Lyallpur in the same department while reacting to guiding statements remarked, "The limited observations of curricula here indicate that there is presently very little of what is generally called general education."

Area of specialization

There seems less disagreement about the importance of this area of preparation. Not only must the citizen-teacher share with his fellow students in a common ground of liberal education, but he needs to undertake advanced study in the academic fields with which he works as a teacher.

Two guiding statements developed and submitted to the members of the jury for their reactions and comments are as follows:

1. The pre-service education curriculum should enable students to acquire such attitudes, understandings, appreciations and knowledge of the physical and biological sciences as are essential in analyzing and solving agricultural problems.

2. The curriculum should enable students to acquire such technical knowledge and skill in plant and soil sciences, animal science, agricultural economics, rural sociology, and agricultural mechanics as are necessary to initiate and promote a good program of agriculture.
All the members of the jury fully supported these two guiding statements.

Rationale

Writing on "The Academic Fields in Teacher Education" Stratemeyer emphasized,

From work in his fields of specialization the student gains the intellectual satisfaction and independence which give him needed confidence, the understanding of the logic and needed control of the methods of investigation and a source of illustrations and resource materials so necessary in helping children and youth deal with problems of living.23

The tendency of overemphasizing the importance of the area of specialization is not very uncommon. This is understandable because knowledge of the subject matter to be taught is the paramount prerequisite for successful teaching. "Another and even more fundamental issue is the one contention that seems to be universally endorsed; that the breadth and depth of academic achievement of future school teachers could and should be greater than they are at present."24

Although historically, the preparation of teachers emphasized specialization in the subjects in which instruction was to be given yet the present century seems to have witnessed more recognition of the importance and need of developing teacher's scholarship well above the


level of the content to be taught. The explosion of knowledge and other technological developments are some of the factors which were instrumental in this increase. Conant emphasized the importance in the following words:

Only through pursuing a subject matter well beyond the introductory level can the student gain a coherent picture of the subject, get a glimpse of the vast reaches of knowledge, feel the cutting edge of disciplined training, and discover the satisfactions of the scholarly habit of mind (so that if he became a teacher he can communicate something of this spirit to others).  

Conant further argued:

I believe that if the student once had the experience of getting inside a subject, he is more likely to become so interested in it that he will wish to go on with it on his own (which I regard as one of the hallmarks of an "educated" person); at the same time he will be less likely to be timid in addressing himself to other complicated subjects, or to accept dogma, or to countenance nonsense on any subject.

Stiles and others give another reason in support of subject specialization.

Subject specialization provides the teacher command of the field of knowledge from which content is drawn for the curriculum. In addition, it promotes intensive scholarship, habits and commitments to intellectual endeavors as well as respect for knowledge and the continuous research by which truth is validated.

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25 Ibid., p. 73. Brackets in original.
26 Ibid.
27 Ibid.
Authorities seem to be agreed on the point of view that one cannot teach significantly and really effectively at the high school level unless he has studied his subject matter far beyond the level he is required to teach. "Classroom teachers insist upon the mastery of the subject matter by those who would be teachers. They recognize that as teachers it will be necessary for them to be highly skilled in the chosen areas they will teach."\(^\text{28}\)

**Practices available in the United States**

Practices differ as to the requirements for specialization. Glancing through the literature, it seems that the trend during the last few years has been toward increased amount of subject matter preparation required for high school teaching. "Only within the present century, however, has recognition been given the importance of pushing the teacher's scholarship well beyond the level of the content to be taught. Efforts to deepen the subject specialization of teachers have been the primary force in extending the length of the program of pre-service preparation."\(^\text{29}\)

Conant reported that of the twenty "prestige" institutions which he studied, the requirements ranged from 18 to 42 semester hours and free elective 24 to 68 hours. He, however, recommended 48 semester


\(^{29}\)Lindley J. Stiles *et al.*, *op. cit.*, pp. 183-184.
hours for high school teachers. In the area of agricultural education, Luster found in his doctoral study that vocational agriculture teachers preparing institutions in the North Central Region devoted 45 to 91.5 quarter hours to technical agriculture in four year teacher education program. The average number of quarter hours required was 66.7 which amounted to 45 per cent of total curricular requirements. Bronson found that Inter Region Land Grant Institutions gave on an average 56.45 semester hours to the area of specialization for majors in agricultural education which was 40 per cent of total curricular requirements with a range of 29 to 49 per cent.

Practices available in the selected institutions

The total requirements as well as requirements for the area of specialization differed in the ten selected departments. Table 3 gives the total requirements as well as the requirements for the area of specialization.

The range of quarter hours in the area of specialization is from 46.5 to 92 quarter hours. Since there is a range in the total quarter hours required for graduation a truer picture is indicated by the percentage of total requirements. The range of percentage as is evident


31 George L. Luster, "Pre-service Curricula for Preparing Teachers of Vocational Agriculture in the North Central Region." Dissertation, The Ohio State University, 1959.

### TABLE 3
Total Requirements for Graduation and in the Area of Specialization in the Selected Institutions

<table>
<thead>
<tr>
<th>Name of Institution</th>
<th>Total Requirements</th>
<th>Area of Specialization</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorado State University</td>
<td>200.0</td>
<td>90.0</td>
<td>45.0</td>
</tr>
<tr>
<td>Iowa State University</td>
<td>200.0</td>
<td>86.0</td>
<td>43.0</td>
</tr>
<tr>
<td>University of Illinois</td>
<td>189.0</td>
<td>75.0</td>
<td>39.6</td>
</tr>
<tr>
<td>California Polytechnic</td>
<td>198.0</td>
<td>92.0</td>
<td>46.4</td>
</tr>
<tr>
<td>University of California</td>
<td>186.0</td>
<td>90.0</td>
<td>47.7</td>
</tr>
<tr>
<td>Michigan State University</td>
<td>183.0</td>
<td>62.0</td>
<td>33.8</td>
</tr>
<tr>
<td>Cornell University</td>
<td>180.0</td>
<td>46.5</td>
<td>25.8</td>
</tr>
<tr>
<td>Pennsylvania State University</td>
<td>198.0</td>
<td>63.0</td>
<td>32.8</td>
</tr>
<tr>
<td>North Carolina State University</td>
<td>205.5</td>
<td>58.5</td>
<td>28.4</td>
</tr>
<tr>
<td>Ohio State University</td>
<td>210.0</td>
<td>60.0</td>
<td>28.5</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>194.9</strong></td>
<td><strong>72.3</strong></td>
<td><strong>37.1</strong></td>
</tr>
</tbody>
</table>
from Table 3 is 25.8 per cent to 47.7 per cent. The average number of quarter hours required is 79.3 per cent which is on an average 37.1 per cent of total quarter hours requirement.

Practices available in Agricultural University, Lyallpur

After completing the common courses for the first two years which have been interpreted as general education courses, a student declares his area of specialization. At present, three areas are available. One is B.Sc. (Honours) Agriculture, second is B.Sc. (Agricultural Engineering, and third is DVM (Doctor of Veterinary Medicine). Both B.Sc. Agricultural Engineering and DVM generally require four years for completion after the first two years of "general education."

B.Sc. (Honours) Agriculture is a three year course after the two initial years. In the last year of the B.Sc. (Honours) Agriculture, a student is required to elect a major, agricultural education. This is one of the fifteen majors available at present.\(^{33}\) A complete listing of courses with hours for each course are given in Appendix E. An examination of these courses and the weekly hours required for each course makes it evident that 51.8 per cent of the total required time for the degree is devoted to the area of specialization. Out of the total of 2307 hours required for the completion of degree, 1196 hours are required for the area of specialization.

Conclusion

The percentage of time devoted to the area of specialization at Lyallpur is 5 per cent more than the department in the United States giving the maximum share to the area of concentration. This is about 26 per cent more than the department devoting least percentage of total time to the area of concentration. The 51.8 per cent time devoted at present to the area of specialization at Lyallpur is 14.7 per cent more than the average share of the area of specialization in its equivalent programs in the United States.

Therefore it is felt that some readjustment is needed in regard to requirements in the area of specialization.

Professional education

The pre-service professional program refers to that portion of the college program designed primarily to orienting the prospective teacher to the function and processes of education, as well as develop skill for teaching. 34

The guiding statement proposed for this part of the curriculum was as follows:

The prospective teacher should have a thorough knowledge of the learner and the learning process and some introduction to methods and materials and curriculum organization.

Three of the members of the jury agreed with the guiding statement without any reservation. One of the two who agreed with reservation

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34 Adapted from Stiles and others, op. cit., p. 203.
maintained that "some introduction into methods and materials and curriculum organization" should be changed to "competent in methods of teaching and curriculum organization." The other member who agreed with reservation argued for the following additions to what was stated in the above guiding statement "and also some ability to plan and develop a program in agricultural education to meet the needs of students in a secondary school in West Pakistan."

Both of these concerns are well taken by the writer. The use of word "some" is considered to be justified because how much comprehensive and efficient program of professional education may be it is difficult to develop complete or full competence. This is considered a lifelong process through subsequent growth. On page 20 in the second guiding statement under area of specialization, the concern of the other member seems to have been taken care of when it was emphasized "as are necessary to initiate and promote a good program of agriculture." The spirit of the guiding statement on professional education is made more explicit in the following pages.

Rationale

Much of the controversy has often been centered around the professional phase. Questions have been raised about the function it is supposed to serve. Many have questioned its value and effectiveness for prospective teachers. More specifically, the number of credit hours assigned, the nature of its emphasis, and its place in the program have been questioned. Professional education has also been criticized for superficiality of treatment, redundancy of content,
overemphasis on theory, and for its failure to challenge intellectual
curiosity and professional interests of students.

There are many reasons and grounds for this criticism. One of
such reasons is that the effectiveness of any of professional courses
seems to be very difficult to be measured to any precise degree. "More
than half a century of research effort has not yielded meaningful,
measurable criteria around which the majority of the nation's educators
can rally."\(^\text{35}\) In addition to this, Stiles and others explained some
of the other reasons.

Throughout the past half century, education courses have
been instituted in state after state by legislative enactments demanding specific amounts and kinds of
pedagogical study for certification. As a consequence, the professional requirements have come into existence
without sufficient research and experimentation to validate their worth, content or procedures; thus, \(^\text{36}\) general faculty endorsement has been imposed by law.

In spite of controversy over the nature of the professional elements
and their proper place in the teacher education program, most of the
leaders in academic as well as professional fields agree that pro-
fessional sequence has some value and therefore has a legitimate place
in the teacher education program. However, such a program should con-
tribute directly to the teacher's understanding and skill in guiding
learning, and help in understanding children and youth, the learning
process, the use of methods and materials in instruction, evaluation of
pupil growth, planning the curriculum, cooperative school administra-
tion, and the broader problems of the profession as they relate to the

\(^{35}\) Chester W. Harris (ed.), op. cit., p. 1481.
\(^{36}\) Lindley J. Stiles et al., op. cit., p. 209.
society, and the function of the school. Emphasizing the recognition and appreciating the growing awareness of the value of professional education, Cottrell and others argued that the work of the teacher of today was vastly different from that of early school master or even of his counterpart of twenty-five years ago. (They attributed this changed role to universal education which brought more children into the schools with widely different capacities and interests. These variations cannot be satisfied through uniform method and content. This requires vastly more extended and complex situations with which children and youth and the teachers have to deal.) "Responsibility for helping children understand broader problems and build sound values in a rapidly changing world, and for meeting the needs of individuals representing widespread differences in background and abilities, has changed the role of the school and with it the work of the teacher."37

Reviewing the proceedings of the three conferences - Bowling Green (1958), Kansas (1959), and San Diego (1960) - of the National Commission on Teacher Education and Professional Standards, Hodenfield and Stinnett reported:

Extremists on one side grabbed the floor (and the headlines) to proclaim that teachers were being taught how to teach but not what to teach and that, really, if you knew your subject well enough, you could teach it.

37 Donald P. Cottrell (ed.), op. cit., p. 146.
Extremists on the other side retorted that if you really knew how to teach, you could teach anything. Saner folk on both sides pointed out that a good teacher ought to know what to teach as well as how to teach.  

**Practices available in the United States**

Luster in his doctoral study found that the range of time devoted to professional education was 27 to 40 quarter hours among agriculture teachers preparing institutions in North Central Region with an average of 32.6 quarter hours. This was 17 per cent of the total curricular requirements. When jurors were independently asked as to what percentage of time should be given to professional education they also agreed on 17 per cent.  

Bronson found in his doctoral study that the Inter Regional Land Grant Institutions in the United States were devoting 17.86 per cent of total curricular requirements to education courses with a mean of 25-27 semester hours and a range of 19 to 13 hours.  

**Practices available in the ten selected institutions**

In the ten selected Departments of Agricultural Education, the requirements in regard to professional education varied from 11 to 40 quarter hours which ranged from 5.56 per cent to 20 per cent. The following table gives detailed information about different institutions.

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39 George L. Luster, *op. cit.*

40 Clement A. Bronson, *op. cit.*
<table>
<thead>
<tr>
<th>Name of Institution</th>
<th>Total Requirements</th>
<th>Professional Education Requirements</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorado State University</td>
<td>200.0</td>
<td>32.0</td>
<td>16.0</td>
</tr>
<tr>
<td>Iowa State University</td>
<td>200.0</td>
<td>40.0</td>
<td>20.0</td>
</tr>
<tr>
<td>University of Illinois</td>
<td>189.0</td>
<td>29.5</td>
<td>15.6</td>
</tr>
<tr>
<td>California Polytechnique</td>
<td>198.0</td>
<td>11.0</td>
<td>5.6</td>
</tr>
<tr>
<td>University of California</td>
<td>186.0</td>
<td>24.0</td>
<td>13.0</td>
</tr>
<tr>
<td>Michigan State University</td>
<td>183.0</td>
<td>30.0</td>
<td>16.4</td>
</tr>
<tr>
<td>Cornell University</td>
<td>180.0</td>
<td>34.5</td>
<td>19.2</td>
</tr>
<tr>
<td>Pennsylvania State University</td>
<td>198.0</td>
<td>34.5</td>
<td>17.4</td>
</tr>
<tr>
<td>North Carolina State University</td>
<td>198.0</td>
<td>34.5</td>
<td>17.4</td>
</tr>
<tr>
<td>Ohio State University</td>
<td>210.0</td>
<td>30.0</td>
<td>15.2</td>
</tr>
<tr>
<td>Average</td>
<td>194.9</td>
<td>29.7</td>
<td>15.2</td>
</tr>
</tbody>
</table>
Practices available at West Pakistan Agricultural University, Lyallpur

In the final year of B.Sc. (Honours) Agriculture degree program, i.e., in the fifth year, a student is required to choose his major. Agricultural education is one of the fifteen major areas available at present. The student is required to complete 175 hours in his major area as compared to total requirements of 2307 hours for graduation. The time spent in major, therefore, is 7.58 per cent to the total curricular requirements.

The courses required in professional education are as follows:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ag Edu 101</td>
<td>General Psychology</td>
<td>(4-0)</td>
</tr>
<tr>
<td>Ag Edu 102</td>
<td>Educational Psychology</td>
<td>(4-0)</td>
</tr>
<tr>
<td>Ag Edu 104</td>
<td>Principles of Education and Curriculum Development</td>
<td>(4-0)</td>
</tr>
<tr>
<td>Ag Edu 105</td>
<td>Methods of Teaching Science and Agriculture</td>
<td>(5-2)</td>
</tr>
<tr>
<td>Ag Edu 106</td>
<td>School Organization and Health Service</td>
<td>(4-0)</td>
</tr>
<tr>
<td>Ag Edu 107</td>
<td>Introduction to Agricultural Education, Adult Education, Extension, Methods, and Community Development</td>
<td>(4-2)</td>
</tr>
<tr>
<td>Ag Edu 108</td>
<td>Student Teaching Part I and Part II</td>
<td>(8-2)</td>
</tr>
<tr>
<td>Ag Edu 109</td>
<td>Term Paper (special problem)</td>
<td>(4-0)</td>
</tr>
</tbody>
</table>

Outline of above courses is available in Appendix E.

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41 The University Calendar, *op. cit.*, p. 70.
Conclusion

Ten institutions in the United States, on an average, devoted 15.2 per cent time of total requirements for graduation. The range was, however, from 5.61 to 20 per cent. On the other hand, Agricultural University, Lyallpur required only 7.6 per cent which was 7.6 per cent less than the mean requirements in the United States. Except for one institution -- California Polytechnique -- the requirements in other institutions ranged between 13.0 per cent and 20 per cent. It was, therefore, concluded that in view of prevalent practices in the United States and emerging importance, the requirements at Lyallpur should be increased.

Electives

Provision of electives in the curriculum is considered one of the means to meet individual differences. The range and degree of electives vary in different teacher preparing institutions.

The guiding statement in regard to individual differences which was submitted to the members of the jury is as follows:

Individual differences should be recognized and the curriculum should be flexible enough to meet specific individual problems and needs.

All the members of the jury reacted favorably to the importance and provision of this guiding statement.

Those who advocate elective system maintain that individual differences are so pronounced that the character and order of a student learning experiences must be determined in terms of his own particular
needs and abilities. "The appeal is usually to the spirit of free inquiry, resistance to on rushing materialism, faith in the good sense of the students, and the importance of giving a person a broadened outlook so that he face the responsibilities..."  

Advocates of a prescribed program indicate the possibility of more systematic planning of courses in relation to one another, with greater assurance that all students will gain those insights, skills, and attitudes which are needed for effective education. They argue that often elected courses do not provide the desirable balance and continuity of experience.

Practices differ as to the degree and range of prescription in different teacher preparing institutions. As a result of a study such range was reported as follows:

Of some one hundred fifty colleges studied only two indicated no electives... In curricula for the preparation of teachers for work in elementary schools the range in electives which may be included in the total program was from four to sixty semester hours; for prospective secondary school teachers, from seven to seventy-two hours.  

Conant also reported on a similar range in "prestige colleges" and "universities." One finds that the number of semester hours free for election ranges from 24 to as many as 60."

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43 Donald P. Cottrell, op. cit., p. 138.

44 James B. Conant, op. cit., p. 100.
Luster reported in his study that agriculture teachers preparing institutions in the North Central Region allowed electives ranging from 0 to 30 quarter hours with an average of 8 which was 4 per cent of the total curriculum requirements.

In the ten selected Departments of Agricultural Education, there is no department which does not provide electives. However, the range varies from three quarter hours to fifty hours with an average of 17.45 quarter hours.

At Lyallpur, under the existing practices, in addition to the provision for the election of major it seems difficult to establish the percentage which can be attributed to electives. It seems, however, clear that the percentage of time allowed the major, i.e. 175 hours 7.58 per cent mentioned under professional education includes time for professional education as well as electives. The exact provision in the Calendar is reported below.

Courses in major and supporting or related subjects, to be selected with the approval of the head of the major department and dean in the case of faculty of animal husbandry for a five-year total of not less than 175 hours of lectures and practical: 13 to 18 weekly hours.45

Conclusion

Although provision for the electives is available at West Pakistan Agricultural University, Lyallpur yet this provision becomes less significant as the time allotted for major is already less as compared to

45 The University Calendar, op. cit., p. 70.
<table>
<thead>
<tr>
<th>Name of Institution</th>
<th>Total Requirements</th>
<th>Elective</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorado State University</td>
<td>200.0</td>
<td>6.0</td>
<td>3.0</td>
</tr>
<tr>
<td>Iowa State University</td>
<td>200.0</td>
<td>8.0</td>
<td>4.0</td>
</tr>
<tr>
<td>University of Illinois</td>
<td>189.0</td>
<td>3.0</td>
<td>1.6</td>
</tr>
<tr>
<td>California Polytechnique</td>
<td>198.0</td>
<td>50.0</td>
<td>25.2</td>
</tr>
<tr>
<td>University of California</td>
<td>186.0</td>
<td>14.5</td>
<td>2.3</td>
</tr>
<tr>
<td>Michigan State University</td>
<td>183.0</td>
<td>7.0</td>
<td>3.8</td>
</tr>
<tr>
<td>Cornell University</td>
<td>180.0</td>
<td>49.5</td>
<td>27.2</td>
</tr>
<tr>
<td>Pennsylvania State University</td>
<td>198.0</td>
<td>10.5</td>
<td>5.3</td>
</tr>
<tr>
<td>North Carolina State University</td>
<td>205.5</td>
<td>13.5</td>
<td>6.5</td>
</tr>
<tr>
<td>Ohio State University</td>
<td>210.0</td>
<td>22.5</td>
<td>10.7</td>
</tr>
<tr>
<td>Average</td>
<td>194.9</td>
<td>17.4</td>
<td>8.4</td>
</tr>
</tbody>
</table>
ten selected institutions in the United States. Moreover, the electives as provided under the present practices are restricted to the time after the declaration of major which is quite late in the final or fifth year.

Summary and recommendation

In the area of curriculum, the practices in terms of time devoted to four components of curriculum -- general education, area of specialization, professional education, and electives -- in the United States and at Lyallpur are different. The following table gives a comparative picture of these practices.

**TABLE 6**

Average Requirements in the Ten Selected Institutions in the United States and at Lyallpur

<table>
<thead>
<tr>
<th>Area</th>
<th>United States</th>
<th>Lyallpur</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Education</td>
<td>39.3</td>
<td>40.6</td>
</tr>
<tr>
<td>Area of Specialization</td>
<td>37.1</td>
<td>51.8</td>
</tr>
<tr>
<td>Professional Education</td>
<td>15.2</td>
<td>7.6</td>
</tr>
<tr>
<td>Electives</td>
<td>8.4</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100.0</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

In view of the discussion in this chapter and conclusions drawn, the following recommendations are offered.
With regard to the percentage of total time devoted to general education, there is not much difference in the practices available at Lyallpur and in the ten selected Departments of Agricultural Education in the United States. Therefore it is felt by the writer that any major deviation in the present practice at Lyallpur may not be very necessary. However, it is felt that all of the areas of knowledge traditionally and generally considered greatly contributing to the realization of the goals of general education are not represented in the curriculum at Lyallpur.

Both tradition and present practices in the United States indicate that physical sciences, biological sciences, social sciences, and humanities should at least be represented. The objectives of all the courses under each of these areas should be identified to provide some guidance to the instructor in the organization of the course. These objectives should aim at the promotion of the aims of general education rather than to serve as an introductory course to the area of specialization.

It was found that area of specialization was devoted 51.8 per cent of the total time at Lyallpur; whereas it was on an average 37.1 per cent in the ten selected institutions in the United States. Thus it was 14.7 per cent less at Lyallpur than the average requirement in the ten selected institutions. Therefore it is suggested that 51.8 per cent should be reduced to about 45 per cent. Time thus saved should be given to the professional education and electives which was 7.8 per
cent at Lyallpur as compared to an average of 23.6 per cent in the ten selected institutions.

The added share recommended for professional education should be usefully employed. For example, Ag Edu 107 should be given more weight than one course because at present it includes introduction to agricultural education, adult education, extension methods and community development. These topics need more than a cursory look and should not be limited to one course. More courses which can be very useful for the prospective agriculture teacher should be added. One such course can be tests and measurements. Some of the other courses at present offered at MEd (Agriculture) level can be more usefully included for B.Ed. (Agriculture) program. MEd (Agriculture) should encourage some specialization in professional area and orientation to research.

In the overall organization of the curriculum it is suggested that courses relating to different areas should not be restricted to certain periods of the degree program. In the area of general education, although more emphasis should be given in the first two years but it should not be limited to the first two years as at present at Lyallpur. Similarly courses pertaining to the area of specialization may start earlier than third year and students should be required to choose their major earlier than late fifth year as at present. The third year might be a suitable time but not later than fourth year. Before a student declares his major, he should be oriented to professional courses.
The role of the advisor should be emphasized. At present, no systematic system of assigning advisor is available. After the student has declared his major, he should be assigned advisor in his major area who should guide his later developments. This seems to be a good and useful practice in the United States, there is no reason why it cannot be followed at West Pakistan Agricultural University, Lyallpur.

Reaction of the jury

There was substantial agreement on all the recommendations made in this chapter. One member, however, wanted to add that "if the student after consultation with his advisor, and consultation with an advisor in another major area wishes to change his major field at any time, he should be permitted to do so; of course this may involve taking more courses than would normally be required for graduation." Another juror after agreeing with the recommendation that the student should declare his major not later than third year also wants students to enroll in courses required in his major field in the third year. The writer agrees to both of these additions.
CHAPTER IV
PROFESSIONAL LABORATORY EXPERIENCES

Professional laboratory experiences, for the purpose of this study, include all those contacts with children, youth and adults in school and community, including observation, participation, teaching, and other leadership activities which make a direct contribution to an understanding of basic concepts and principles as well as of individuals and their guidance in the teacher-learning process.¹

The following guiding statement was submitted to the members of the jury for their reaction.

The prospective teacher should have some minimum period of student teaching under typical conditions under competent supervision, as is needed to develop initial confidence and competencies required to plan, teach and conduct a good program of agriculture and to apply theoretical knowledge to practical teaching situation.

All the members agreed substantially with the guiding statement.

Rationale

Student teaching generally constitutes a period of guiding teaching when a student teacher assumes increasing responsibility for

directing the learning of a group or groups of learners over a period of consecutive weeks. Student teaching conveys the same sense for the purpose of this study. It may, however, be noted that as such it is a part of the total professional laboratory experiences and according to the guiding statement mentioned above, it is the minimum which should be provided.

These experiences are educational experiences which do not so much aim at the mastery of specific techniques and skills as in the ever increasing ability to solve problems. "Learning through experience" is a phrase which is often repeated in educational circles since Dewey challenged the traditional methods of teaching. But many a time the word experience is viewed more narrowly than perhaps what Dewey had thought. Explaining Dewey's position, Sharpe argued

He insisted that the complete experience included purposing, planning, acting, and evaluating. Thinking about the experience, relating it to past experiences, and interpreting its significance for future experiences are as such a part of the complete experience as the action itself.²

Dewey also cautioned against viewing practice too narrowly. His argument was as follows:

Two controlling purposes may be entertained so different from each other as radically to alter the amount, conditions, and method of practice work. On one hand, we may carry on the practical work with the object of giving teachers in training working command of the necessary tools of their profession; control of the

technique of class instruction and management; skill and proficiency in the work of teaching. With this aim in view, practice work is, as far as it goes of the nature of apprenticeship. On the other hand, we may propose to use practice work as an instrument in making real and vital theoretical instruction; the knowledge of subject matter and principles of education. This is laboratory point of view.3

It is argued by many persons that the role of direct experiences is to provide the learner with an opportunity to solve his problems. Problems arise when one is perplexed because he is not sure of his goals or of how to reach them. Direct experiences then become a learning laboratory - a problem situation in which the learner has an opportunity to analyze a problem; bring his information, understanding and skill to bear upon the problem; plan an attack upon the problem; actually apply the plan to the solution; and finally set back and take an analytical look at the whole process.

Explaining the psychological foundations of professional labora
tory experiences Sharpe said:

The belief that all genuine education comes about through experience provides the psychological foundations. Contributing to this belief are three assumptions which have been tested and have come to command a considerable degree of acceptance: that one learns best when he is actually involved in achieving his purpose, when he is solving his problems; that the funded experience of others should serve as resource material for learning but should not circumscribe it; that valuing, thinking, and acting are all parts of the process of living and cannot be divorced from each other.4

4 Donald M. Sharpe, op. cit., p. 189.
Conclusive research evidence is not available to provide clearly identified effects and contributions of professional laboratory experiences. This position is substantiated by Andrews who maintained that "Neither formal research nor theoretical statements give much assistance in identifying the effects of the use of direct experiences as an integral part of the teacher-education curriculum." However, some studies are available which reveal the values which student teachers report they gained through these experiences. The Flowers Report included a principle devoted to the contribution of direct experiences, and is stated thus:

Principle 1. The particular contribution of professional laboratory experiences (including student teaching) to the education of teachers is three fold: (1) an opportunity to implement theory - both to study the pragmatic value of the theory and to check with the student his understanding of the theory in application, (2) a field of activity which, through raising questions and problems, helps the student to see his needs for further study; and (3) an opportunity to study with the student his ability to function effectively when guiding actual teaching learning situations.

Andrews argued that direct experiences contribute to the education of a teacher in one or more of the following ways:

1. Providing a basis for a personal decision to become or not to become a teacher.

2. Developing readiness for professional courses, professional growth, and for full responsibility teaching.

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6 Sub-Committee of the Standards and Surveys Committee, School and Community Laboratory Experiences in Teacher Education (Oneonta, New York: American Association of Teacher Colleges, 1948).
3. Developing mature professional purposes and attitudes.

4. Strengthening understandings by exposure to reality which adds feeling and other sensory impressions to verbalized knowledge.

5. Providing an opportunity to acquire, use, and test information.

6. Developing professional understanding of concepts and theories from professional and related discipline.

7. Developing skill in the use of professional technique.

8. Developing insight and judgement in applying professional knowledge.

9. Providing a basis for evaluating professional, social, and personal growth.

10. Providing a feeling of significant personal growth - the satisfaction that comes from giving useful professional service.

Professional laboratory experiences if viewed in light of above statements have certain characteristics. Most important of these are the following:

1. It is guided experience which make a direct contribution to the student's understanding of individuals and competence in their guidance in teaching learning situation.

2. It requires the student's involvement in interaction with children, youth or adults.

3. It provides opportunity for the students, in terms of his level of readiness, to participate in representative activities of the teacher.

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8 Donald P. Cottrell, op. cit., pp. 184-185.
Student teaching is perhaps the most important component of professional laboratory experiences. Its importance and place are generally well recognized. Andrews believed that

Student teaching is the most universally approved education course, both by educators and the general public - approved rather generally even by the severest critics of professional teacher education... only very rarely does one find a writer or professional committee recommending elimination of student teaching or even a sharp reduction in either its extent or credit given for it.9

Conant generalized that "the one indisputable essential element in professional education is practice teaching."10 Student teaching considered for a long time as the most important activity in the professional education program has recently acquired more scope and is viewed more broadly. This is substantiated by the following statement:

Student teaching was viewed at first as an opportunity for students to pick up a few patterns of teaching; now it is recommended that student teaching should provide opportunities to develop a high level of competence in all phases of the teacher's work.11

Andrews identified three goals of student teaching which are the following:

1. To provide for a concentrated period of growth in professional and personal attributes, understandings, and skills of the teacher.

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9 L. O. Andrews, op. cit., p. 3.
2. To assist a student to discover if teaching is what he really wants to do, and actually can do.

3. To permit a student to demonstrate that his ability and potential warrant recommendation for a teaching certificate.\textsuperscript{12}

Michaelis writing on "Student Teaching and Internship" in the \textit{Encyclopedia of Educational Research} argued that a well rounded program of student teaching should provide

\begin{quote}
\begin{itemize}
\item[(a)] An opportunity to apply basic educational principles and procedures,
\item[(b)] means for clarifying the student teacher's strengths and weaknesses and stimulating him to make improvements,
\item[(c)] expert guidance and supervision in dealing with a variety of school problems,
\item[(d)] experiences with children in extra class and in out-of-school activities, and
\item[(e)] experience in community activities.\textsuperscript{13}
\end{itemize}
\end{quote}

Perusal of above two quotations describing the goals of student teaching will indicate that most of the objectives of professional laboratory experiences put forth earlier are sought to be realized through student teaching. This may further indicate that student teaching is the most important ingredient of professional laboratory experiences and that it is not only an integral part of these experiences but a nucleus around which professional laboratory experiences are developed and thus contribute to the realization of main objectives.

Student teaching in agricultural education is generally regarded as one of the greatest opportunities of student career to develop those attitudes, abilities, and understandings in student teachers which are

\textsuperscript{12}\textit{L. O. Andrews, op. cit.}, p. 20.

\textsuperscript{13}\textit{Chester W. Harris, op. cit.}, p. 1474.
necessary in his professional life. Generally opportunities are provided student teachers to teach young farmers and adult farmer classes as well as high school classes. Visits to farms, agri businesses and other industries in the community are arranged with a view to enable the student teachers to discover problems and opportunities to help boys, parents, and employers solve many problems. Opportunities are also provided to get insight into other responsibilities of the regular teacher which he generally discharges in the course of his daily routine. As a part of these experiences the student teacher is also expected to know and participate in the life and activities of the school in general. The student teacher should, however, try to see vocational agriculture as an integral component of the total educational experiences which are provided in the school. Direct experiences, in addition to student teaching, are provided as summer and September experiences by many Departments of Agricultural Education in their pre-service education programs.

Practices available in the United States

Practices differ as to when student teaching and other experiences should occur. As of 1951 student teaching was reported to be predominately a culminating experience. On the elementary level, 92.2 per cent of the time, it was in the senior year and at secondary level, 97.8 per cent of the time it was offered in the senior year.14 Later

some evidence of change in thinking was available when The Fourth Annual New Teacher's Conference of the California Teachers Association recommended in 1957 that "the amount of time devoted to student teaching should be increased with as much as possible of the theoretical training coming later."\(^{15}\)

In the ten selected agricultural departments in the United States student teaching was done in the final year. However, practices differed as to the quarter or semester of the year in which students generally did practice teaching.

The departments did not seem to be particular about any quarter or semester in the final year as more suitable for student teaching.

The second aspect investigated in the ten selected institutions in the United States relates to incentives for cooperating teachers and student teachers. Many persons consider it as "the focal point of the rapidly rising tide of concern with the student teaching problem, for both colleges and cooperating teachers. Of all the factors that have a bearing on student teaching, this is one which is most subject to emotional pressures and to the establishment of both aggression and defensiveness."\(^{16}\)

Although different incentives are offered cooperating teachers yet "It appears beyond doubt that as of the present, it is more common


\(^{16}\)Ibid., p. 13.
practice to offer some amount of financial renumeration to cooperating teachers than to award them any other consideration."  

However, there are persons who favor the idea of not paying cooperating teachers. Hahn who made a survey of student teaching practices in some twenty-three colleges reported no uniformity of practice and described that one director of training in a large institution reported that he abandoned the plan of paying directing teachers. And that as a result, he said, "We are now getting directing teachers who are genuinely interested in the job and not in adding to their incomes."  

Stratemeyer and Lindsey recognized three general kinds of financial arrangements:

1. The college pays each classroom teacher who serves, varying from $10 per semester to $300 per year regardless of the number of students. In some cases the principal is also paid.

2. Colleges pay into funds of the school system the money being used to improve the student teaching program.

3. No payment is made, on the assumptions that the student will within a year become a teacher, the service is an obligation of the schools, and helping in the program is good for the school.

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17 Ibid., p. 13.


19 Florence B. Stratemeyer and Margaret Lindsey, "Your Relationships with College," Working with Student Teachers (New York: Teachers College, Columbia University, 1958).
The 1951 Yearbook for Association of Student Teaching described twelve kinds of awards in Chapter IV. These are the following:

1. Payment of money directly to the cooperating school or district.
2. Awarding of tuition credit to the cooperating teacher.
3. Awarding of cash honorarium to the cooperating teacher.
4. Furnishing substitute teachers for the cooperating teacher.
5. Furnishing expense money for cooperating teacher's attendance at workshops, conferences, and conventions.
6. Housing of public school students in college-owned building.
7. Granting to cooperating teachers the use of college facilities not offered to other teachers.
8. Supplying educational equipment, supplies, texts, and furniture.
9. Supplying occasional consultant services by college staff.
10. Awarding of a four year scholarship to a student of the cooperating school.
11. Awarding a cash honorarium to the cooperating principal.
12. Awarding of credit toward the bachelor's degree to the cooperating teacher.

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20 Association for Student Teaching, "Off Campus Student Teaching," Thirteenth Yearbook (State Teachers College, Lock Haven, Pennsylvania: The Association, 1951).
Of 123 institutions reported in the above study, fourteen made no award; ninety-one made one kind of award; fifteen made two kinds; and thirteen made three kinds.

In addition to financial incentives such benefits as reduction in the teaching load of cooperating teachers, tuition free courses, and free tickets for games are sometimes used with other kinds of awards.

Practices of compensation for student teaching were reported to be different in the ten selected Departments of Agricultural Education. The practices as reported were as follows:

<table>
<thead>
<tr>
<th>Name of the Institution</th>
<th>Nature of Compensation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorado State University</td>
<td>$75.00 per trainee</td>
</tr>
<tr>
<td>Iowa State University</td>
<td>$25.00 per trainee for 6 weeks</td>
</tr>
<tr>
<td>University of Illinois</td>
<td>Free tuition for one semester and $8.00 per credit hour for all students assigned</td>
</tr>
<tr>
<td>California Polytechnique</td>
<td>No direct but $75.00 per quarter per school</td>
</tr>
<tr>
<td>University of California</td>
<td>None financial</td>
</tr>
<tr>
<td>Michigan State University</td>
<td>None financial</td>
</tr>
<tr>
<td>Cornell University</td>
<td>$250.00</td>
</tr>
<tr>
<td>Pennsylvania State University</td>
<td>$150.00 per year</td>
</tr>
<tr>
<td>North Carolina State University</td>
<td>$50.00 per student teacher</td>
</tr>
<tr>
<td>The Ohio State University</td>
<td>$100.00 per student per quarter or $150.00 for two student teachers per quarter</td>
</tr>
</tbody>
</table>

Out of ten selected Departments of Agricultural Education, eight departments offered financial incentive although the amount of payment varied in different departments.
While summarizing the available practices in the United States regarding payments Woodruff said:

It is clear that cash payments are very commonly used to compensate cooperating teachers for the participation in the program, and that on the whole the payments are rather small. Other awards and recognitions are fairly commonly used, sometimes accompanying cash payments, but more often without them.\(^{21}\)

But the same author also argued that

\ldots there is agreement that payment of stipends by colleges directly to individual cooperating teachers is an unsound practice\ldots. Among the difficulties related to this practice they list inequities to teachers, inadequacy of the payments that are budgetarily feasible, de-emphasis of quality under the preoccupation with reward, contention which seems to grow constantly out of the practice, and the poor administrative practice of permitting an employee to become obligated to another institution through a monetary consideration. Several parties have also stated that the practice is of doubtful legality. In fact, some governing school bodies have flatly called it illegal.\(^{22}\)

Some of the other alternative ways of compensation were described by Glennon, Weeks, and Ulrich with frequency of usage in 135 institutions.

\[^{21}\text{Asahel D. Woodruff, op. cit., p. 22.}\]

\[^{22}\text{Ibid., p. 21.}\]
Accepted members of faculty with voting privileges 7
Serving as members of committees with college faculty 9
Listed in college catalogue 4
Not members, but attend meetings on invitation 40
Considered as associate faculty with no rank 32
Without status 23

The second aspect of student teaching investigated in the ten selected departments related to the selection of cooperating teachers. The matter is considered one of the most important factors in the area of professional laboratory experiences. Woodruff emphasized that "there is agreement that the function of a cooperating teacher is now one of the most responsible in the profession and also a major function in scope; that because of its scope and particularly its importance, it is imperative that it be performed by teachers of high quality." 24

Two aspects were considered relevant to the selection of cooperating teacher. One related to the factors or criteria considered in the selection and second who selects cooperating teachers.

Authorities may not agree totally on all the factors to be considered in the selection of cooperating teacher and how much weight

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23 Association for Student Teaching, "Off-Campus Student Teaching," Thirteenth Yearbook, op. cit.
24 Asabel D. Woodruff, op. cit., p. 21.
each should be given but general consensus on the broad areas significant in the selection may not be impossible. Wiggins identified what might be a rather important one. He stated:

...the supervising teacher must consistently demonstrate good teaching. Beyond this first requirement the supervising teacher must know what it is about his teaching that makes it good. He must be able to analyze it. This, it would seem, is a necessary step toward communicating to student teachers some of the ways in which generalizations about good teaching can be drawn and can later take shape in definite, specific acts of teaching.25

In agricultural education, the emphases are not only on the teacher but on the program of vocational agriculture where the teacher is one of the factors but perhaps the most important of all the factors. In the ten selected departments, the following factors were most commonly considered in the selection of the teaching centers:

1. Balanced and comprehensive vocational agriculture program.
2. Quality of vocational agriculture teacher.
3. Minimum teaching experience of two years or more.
4. The facilities available.
5. Administration's attitude.
6. Typical community environments.
7. Community acceptance of student teacher.

In the second question as to who selects the cooperating center, all the ten departments were unanimous. In all cases either the joint

25 Sam P. Wiggins, "The Valiant Supervising Teacher," Keynote address, Annual Conference of the Association for Student Teaching, 1959 (mimeo).
staff of supervisors and teacher educators in vocational agriculture selects the cooperating centers or they are selected in consultation with each other.

All the ten departments reported that with the exception of a few students who commuted all the student teachers lived in the community where they taught. Five of the ten departments reported that they assigned two student teachers per cooperating teacher and the rest of them assigned one per teacher. The number of student teachers placed in each center per year varied from one to four.

The number of credits given student teaching vary greatly in different colleges in the United States. From a study covering 396 members of the American Association of Colleges for Teacher Education conducted in 1959 indicated the range of college credit given for student teaching. The range in credit hours as reported in this study was from five to sixteen.  

Andrews also reported that "Students earn from two to twenty or more semester hours of credit in student teaching and are assigned in a school from one period (or hour) a day for part of a term to full days for more than a semester." Accordingly, the period of time student teaching is generally practiced varies a great deal. Woodruff as a result of the same study reported the range as follows.

26 Asabel D. Woodruff, op. cit., p. 32.

One full year, full time 3
One full year, half time 11
Two terms of school, full time 5
Two terms of school, half time 19
One term of school, full time 118
One term of school, half time 121
One half term of school, full time 71
Other 89

In the ten selected departments, the number of college credits given for student teaching ranged from 9 quarter hours to 15 quarter hours with a mean of 10.9 quarter hours. The detailed information was as follows:

<table>
<thead>
<tr>
<th>Institution</th>
<th>Number of Weeks for Student Teaching</th>
<th>Number of Quarter Hours Given for Student Teaching</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorado State University</td>
<td>6.0</td>
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<td>University of Illinois</td>
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<td>California Polytechnique</td>
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<td>Ohio State University</td>
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<tr>
<td><strong>Average</strong></td>
<td><strong>10.6</strong></td>
<td><strong>10.8</strong></td>
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In all the ten selected departments, the student teaching was full time. The number of weeks student teaching was done, however, varied from 6 to 18 weeks with a mean of 10.6 weeks.

Another question which was investigated in the ten selected institutions in the United States related to whether student teachers received any benefit other than college credit. Four out of ten institutions did not provide any other benefit. However, the rest of the six did provide some benefit other than college credit. Two of the institutions in California provided internship salary and mileage allowance to and from the teaching center and the parent institutions. It may, however, be mentioned that these two institutions have five year pre-service education program. Three other institutions give one round trip mileage to the teaching center and The Ohio State University provided mileage involved in the supervision of local programs of agriculture and the travel that is necessary to attend seminars that are scheduled throughout the quarter.

Four of the ten institutions did not provide either summer experience or September experience. Four institutions provided only September experience. The duration, however, varied from one to four weeks. One institution required only summer experience for two weeks, and one institution required both summer experience and September experience. In all of those cases these experiences were in addition to student teaching.
The number of times student teachers are visited during their clinical experiences varied from two to ten with an average of 4.2 visits.

Practices available at West Pakistan Agricultural University, Lyallpur

The pre-service education program of agriculture teachers at Lyallpur provides for student teaching. Two courses carrying nine credits are given for student teaching. As a matter of fact two courses are listed as Part I and Part II in the Calendar of the University. However, information relating to such matters such as compensation to cooperating teachers and student teachers if any, period of student teaching, criteria for the selection of teaching centers and the nature of experiences provided in student teaching are not available. According to the knowledge of the writer, policy and practices relating to these aspects is not yet well developed. Lack of well developed policy and practices might be attributed to the recency of the department.

It may be interesting to note that laboratory school on the campus is being provided on the premises of the University.

Conclusion and recommendation

The college credit given for student teaching at Lyallpur is about the same as average credit given for student teaching in the ten selected institutions in the United States. It is felt by the writer that radical deviations from the available practice at Lyallpur may not be necessary at this stage.
Student teaching at present, at Lyallpur consists of two parts. Detailed description about the nature of this division is not available. It is, however, recommended that one part of student teaching should be done in the laboratory school on campus and another part should be devoted to student teaching in a typical school in the community.

It seems difficult for the student teachers to register for any on-campus course while doing student teaching in the community as means of transport and communication are not well developed in the rural areas. Therefore, it is suggested that in addition to student teaching, the student teacher should be required to do community study in the same community for which college credit may be provided. The total period devoted to student teaching may be about ten weeks.

At present most of the extension agents for rural areas are located incomparatively bigger towns. In most of the cases they are required to serve in a radius of 25 to 30 miles. Since the means of transport and communication are not well developed, the communication seems to be less effective than desired. In this situation it is quite likely that the local agriculture teacher, being a "specialist" would be called upon to do some extension work. Moreover, he might get opportunities to cooperate with the extension agent on many projects designed for the development of rural areas. Under the circumstances, it is suggested that the prospective agriculture teacher may be given an opportunity to get practical experience in extension work. College credit should be given for this experience.
During his student teaching period the student teacher may not be exposed to all or most of the responsibilities of agriculture teacher as many of these are seasonal. Therefore it is suggested that effort should be made to broaden the scope of student teaching so as to include experience in most of the activities of a typical agriculture teacher.

In other teacher education institutions in West Pakistan cooperating teachers in other school subjects are not provided financial incentives at present. They are not likely to be provided in the near future as it would involve colossal amount of money. Therefore, it is felt by the writer that financial compensation to agriculture teachers may create some complications, conflicts and even frustrations in the school faculty and administration. Therefore agriculture teachers may not be given financial compensation. However, it is suggested that consideration should be given for some nonfinancial compensation which will improve professional efficiency of the agriculture teacher. These may include such incentives as privilege of borrowing books from the University libraries, providing mileage and free accommodation in the University hostels at the time of meetings, workshops, and conferences if available, and providing books and other instructional material to vocational agriculture departments.

Student teachers in other teacher education institutions in West Pakistan are not provided any financial compensation. But almost all the teacher education institutions are located in big cities and students do not have to go outside the city for student teaching. But in
case of prospective agriculture teachers, they will have to go to the rural community (if recommendation made above is accepted) for the student teaching. This will involve extra expenditure on the part of the student teacher. Moreover laboratory expenses in science courses are met mostly by the University as the tuitions are very nominal. Student teaching being similar to laboratory for the prospective teachers should be given the same treatment. In view of this, it is recommended that student teachers should be given some financial incentives.

Reaction of the jury

All the jurors agreed basically to all the recommendations in regard to professional laboratory experiences. However, one of them felt that student teaching in laboratory school should only be initial introduction to teaching for 15 per cent of the total time to be devoted to student teaching and the experience in agricultural extension should be limited.

It is maintained by the writer that there is still no need of making any changes in the recommendations already made as specific division of total time for student teaching between campus school and community school was not suggested. It was only recommended that both of these facilities should be used. Experience in extension was not suggested as a major activity in professional laboratory experience program.
CHAPTER V

PLACEMENT, FOLLOW-UP, AND IN-SERVICE EDUCATION

Three topics, placement, follow-up, and in-service education, are discussed in this chapter. Their treatment in the same chapter grows out of the belief that they are inseparable aspects of teacher education program and among themselves, and their discussions in different sections of this chapter are only for the sake of convenience and expediency.

It might be pointed out that this study is limited to the pre-service education program which was normally conceived ending at the graduation of the prospective teacher. Under this impression only very little was included in the survey form which was used to collect information from the ten selected Departments of Agricultural Education in the United States. Therefore, it has not been possible to include much information in regard to the procedures and practices on placement, follow-up and in-service education in the ten selected Departments of Agricultural Education. Consequently what follows in this chapter has been taken largely from the literature.

These three topics of placement, follow-up, and in-service education are included in the study mainly to show that although this study was limited to pre-service education program is intimately connected with what follows to the graduate after his graduation.
Rationale

The progress made by professional education of teachers is marked generally by increasing agreement upon certain fundamental purposes and functions. One such agreement seems to be that the teacher preparation should participate broadly in the continuous improvement of educational facilities for boys and girls in the schools. The mutuality of interests between schools and teacher preparation institutions seems to mark a positive trend in modern education. Therefore, it is no wonder that the efficacy of a program of teacher education is greatly measured in terms of its contribution to the progress of general education. To further their contribution to public education, the range and scope of teacher education programs seem to have been expanded significantly. Each service unit within these programs seems to have interpreted its functions and widened its sphere of influence, bringing it more in focus with their major objective.

Placement

Good has defined placement as "the process by which teachers obtain teaching positions."¹ Shartle and Beatty defined placement as "that service which the college renders to the individual student which enable him to learn of opportunities in the fields of his selection and to secure that in which he will most likely find success and

satisfaction." For the purpose of this study the term placement is used in the same sense in which Code Committee of Western Institutional Teacher Placement Association explained this term. Their explanation was as follows:

In this specialized placement field, placement offices attempt to bring about better organization of the supply and demand for workers in education to the end that employers and qualified candidates are brought together in the most efficient manner. Through the skillful assistance of the placement services, better selection of candidates occurs, maladjustment and turnover are reduced, and high levels of teaching and administration are reached.3

The term "placement" as used for the purpose of this study seems to have meant very little to the early universities and colleges in medieval times. The term, however, was used in a comparatively narrower sense by the universities and colleges about one hundred years ago. The nature and scope of the term then used was explained as follows:

Insofar as graduates were concerned that term applied to the first group (medieval universities and colleges) little else but assignments to such posts as were prescribed by authority, and to the second group (universities and colleges hundred years ago) a faculty recommendation for certain people deemed ready to take such posts as had (through word of mouth or occasionally

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3 Code Committee, Western Institutional Teacher Placement Association, "Code of Ethical Practices for Placement Officers," California School, XXII (June, 1951), pp. 242-244.
through correspondence) been listed as "open." A placement officer as we know it today was unknown to either group.4

Stiles and others also took similar position when they maintained:

In the past many major institutions have looked upon placement as a type of clerical service rendered to their graduates and to employing school systems. Often the service was operated haphazardly by non-professional personnel. Little integration existed between the placement activities and a program of teacher preparation. Often the services to school systems were more on a level of an employment office, consisting only of notifying candidates of vacancies.5

More and more institutions seem to be realizing the importance and broader scope of placement activities. This is well explained in the following statement:

Institutional teacher placement is not an altruistic venture initiated by warm hearted administrators. It is a professional obligation. Thus teacher placement is now absorbed as a unit of major significance into the teacher education movement. It has broadened its purposes to assume its share of the total burden of the institutional functions along with other coordinate elements. The best thought in teacher education now holds the task of teacher preparation incomplete until those prepared are placed in positions where they can best initiate their professional careers.6

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Stiles and others explained that "A number of major universities, particularly some of the private institutions have given excellent leadership to the development of the placement function as an integral element of the program of teacher education." The transition from past narrow concept of placement to present day practice is explained by the following statement.

Where originally the major interest of institutional teacher placement was job-getting, other functions now begun to emerge.... The teacher placement programs is no longer set apart from other divisions independently of them, but has become an integral element of the entire organization of teacher preparation. At its best, it has become a dynamic force directing its influence into many significant channels. There exists a complete unity of purpose between the teacher placement program and the institutions it serves, the institutional philosophy is quite completely reflected in its operation. Accordingly, the effectiveness of the teacher placement program must necessarily be measured by the same criteria used for the institution as a whole.8

If placement is visualized in light of modern concept and practice, it becomes more than just helping prospective teachers to obtain positions or schools to fill vacancies. Stiles and others thought that "Placing the right teacher in a right position is the most important step that can be taken to improve schools."9 The Placement Association emphasized that

...it provides opportunity for continuing studies, the findings of which may indicate methods of improving the

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7 Lindley J. Stiles et al., op. cit., p. 305.
9 Lindley J. Stiles et al., op. cit., p. 305.
process. Professional placement requires a program involving a thorough going analysis of the teacher, the careful study of the area served, liaison with many kinds of schools and employers, and effective counseling.\textsuperscript{10}

The purposes of placement were summarized by the Placement Association as follows:

1. To appraise the interests, needs, capacities, and potentialities of the student or graduate with respect to qualifications for employment.

2. To discover employment possibilities in relation to the interests, needs, and qualifications of the student or graduate.

3. To bring the prospective employer and the prospective employee together for the purpose of establishing mutuality of interests with a view to employment of the latter.

4. To assist the prospective employer in appraising the resources of the institution in relation to his needs in general, and the qualifications of students or graduates for the position available in particular.

5. To obtain knowledge of employment needs, actual, imminent, or potential, which may assist the institution in adapting its total program and its placement and follow-up services to serve more effectively the needs of the children to be served and the prospective teachers to be placed.

6. To develop relationships with prospective employers which will promote mutual understanding and cooperation in the placement and follow-up of well qualified students and graduates.\textsuperscript{11}

\textsuperscript{10} The National Institutional Teacher Placement Association, \textit{The Dynamics of Teacher Placement}, \textit{op. cit.}, p. 18.

If placement services are to serve their purposes well, they should represent a systematic, organized program supported by the entire faculty of the training institution to (1) strengthen the preparation of teachers, (2) help teachers grow in service and advance to positions of more effective service, (3) evaluate programs of teacher preparation and then to make required changes and adjustments in the total program as a result of such evaluation, and (4) appraise the conditions faced by teachers on the job. Therefore, "the quality of leadership of the placement program is as important as any other service maintained for prospective teachers."^12

The provision and proper functioning of such placement services seem to be very important for the candidates, society, and the institution itself. This is suitably explained in the following statement:

It is sufficient to close by emphasizing that institutional teacher placement is an important part of the teacher training program of an institution. It renders an important service to society. Therefore, placement officers should work toward the goal of universal acceptance of the principle that such services should be strengthened, supported, and accepted an integral part of every institution's program of teacher education.^13

As far back as 1950, it was reported by Archer that

There has been a growing tendency for educational institutions to assume greater responsibility for such services. Teacher placement as part of the total

^12Lindley J. Stiles et al., op. cit., p. 306.

program of selection and guidance, and preparation seems to be quite well accepted.\footnote{14} If the placement services are to be provided in light of modern theory and practices, the responsibilities of the head of such services become very important. This was explained by Stiles and others as follows:

The director of teacher placement in such a program assumes a heavy responsibility for the success and quality of the total program of teacher education. He must work closely with members of the faculty of various departments which contribute to the education of teachers. He also serves in a liaison capacity with educational leaders in the field. It becomes his duty to assist in the appraisal of personnel practices of local school systems and the approaches to placement of members of the faculty of the institution he serves. Perhaps most important of all, he assumes the responsibility of helping the faculty committees judge the success of graduates after placement. Such a process is the key means whereby the institution can evaluate the strengths and weakness of its program of pre-service preparation for teaching.

The director of teacher placement will, in addition, as a professional person, be continually engaged in research related to such problems as the selection of teachers, the demand for teachers, the factors that make for success in teaching, and the qualities needed for school leadership.\footnote{15} To a certain degree the principles and practices of institutional teacher placement are determined by the relationship of the office to the administrative organization of the institution. The organization of placement services vary in different institutions in the United States. It may be centralized, decentralized and combinations of the two.

\footnote{15} Lindley J. Stiles \textit{et al.}, \textit{op. cit.}, p. 306.
in some institutions the office of teacher placement is a special department operated under a separate budget. In others, teacher placement activities are assigned to the total personnel division or to the dean of students' office. Under such circumstances there is an overall head, or director, and each division is headed by other officers. In other administrative organization the office is attached to the education department of teacher training departments. 16

Practices available in the United States

It was reported by Archer

...that 29 out of 37 large universities and 30 out of 38 small liberal arts colleges handled teacher placement through a separate office established largely for that purpose. Thirteen large universities and eight non-state liberal arts colleges handled all placement through a centralized office.

In large institutions the director of teacher placement sometimes devotes full time to this function, but placement in many colleges is combined with teaching, personnel and guidance work, supervision of student teaching, registrar duties, direction of extension, and in some instances with work as head or dean of education. 17

Shartle and Beatty reported that four types of organization (a) departmental autonomy, (b) functional centralization involving several placement agencies set up on functional lines, as for teachers, engineers, and business students, (c) combination of functional and developmental, (d) university centralization in which all placement work routes through one office, which supplements the placement activities of all departments but does not restrict the faculty in any placement


17 Clifford P. Archer, op. cit., p. 1427.
work which they wish to do....that most state universities operate under a decentralized plan in which is combined the allocation of some placement to functional central offices, leaving the remainder to departmental autonomy.\textsuperscript{18}

The same authors reported a study conducted by Stephens. According to this study which covered 93 engineering and technical schools, 43 colleges made placements through the heads of departments, 26 had coordinated the placement work under one individual, and 24 had set up unified placement offices.\textsuperscript{19}

It was reported in 1960 edition of \textit{Encyclopedia of Educational Research} that

Centralized, coordinated, and decentralized organizations and a degree of departmental autonomy still prevail. Bryant reporting data from a doctoral study, indicates that of 141 selected higher institutions included in a questionnaire study, nearly 60 per cent operate centralized offices including teacher placement, 21.6 per cent have centralized placement services for all department except teacher placement, and 18.6 per cent provide decentralized placement facilities. Two-thirds of the private institutions operate centralized placement offices, whereas only one-third of the state institutions do so. The larger the institution, the more likely placement is to be operated on a decentralized basis.\textsuperscript{20}

\begin{footnotesize}
\begin{itemize}
\item \textsuperscript{18} C. L. Shartle and John D. Beatty, \textit{op. cit.}, p. 1324.
\item \textsuperscript{19} \textit{Ibid.}, p. 1324.
\end{itemize}
\end{footnotesize}
In the ten selected Departments of Agricultural Education in the United States, one department took almost full responsibility for placing the beginning teachers of agriculture. In the other nine departments centralized services either on college or school level or university level were mainly utilized by the Department of Agricultural Education for the placement of agriculture teachers. However, in all of these cases the professional staff of the department worked in close and full cooperation with the centralized office. In three of nine departments one faculty member was designed officially to provide leadership in the area of placement services in cooperation with the centralized office or bureau.

No mention of placement facilities is made in the Calendar of the West Pakistan Agricultural University, Lyallpur. However, according to the information of the writer some facilities were available in a centralized office in the University at the time of his departure for the United States in June, 1964. The office was still in the initial stages of its development at that time.

Follow-up

The following guiding statement when submitted to the members of the jury received approval of all of them.

Even the best possible pre-service educational program cannot produce beginning teachers who are fully competent in all aspects of their work. Therefore, efficient and regular follow-up program should be provided.
Importance and rationale

Many people believe that follow-up is natural extension of placement services. This position was taken by the National Institutional Teacher Placement Association when it was said that "Some placement people believe there is no more important function in placement than that of following up the professional careers of candidates." The same Association defined placement and follow-up together in 1941.

Placement and follow-up are those functions of a total student personnel program which are concerned with assisting the student or graduate in obtaining a position suitable to his interests and qualifications under conditions offering maximum opportunities for both individual satisfactions and social service, of evaluating his professional experience, and of assisting him in his further professional adjustment.

Report Clifford, Trump and Totero wrote that:

He found that placement and follow-up are inseparable in both theory and practice. Follow-up is the evaluative phase of placement and all other services involved in the guidance and instructional program of a given institution.

Good defined follow-up as "a plan by which the experience or status of young people who have left school are investigated or surveyed, either for the purpose of assisting them in further adjustment or for securing facts to improve the plan of guidance for those still


23 Chester W. Harris, op. cit., p. 936.
in schools." Stiles and others defined follow-up services as "designed to help beginning teachers make the transition from college to successful full-time teaching."\(^\text{25}\)

For the purpose of this study follow-up activities will include all activities which are designed for the beginning agriculture teachers in the first year of their career to assist them in their adjustments to their jobs and communities so that their full and maturing potentialities may be realized; and such activities are initiated by the training institution with or without active cooperation from other agencies. Some people take the position that follow-up activities should properly be labeled as in-service education. As a matter of fact follow-up activities are an integral part of in-service program. However, in view of some peculiar needs of beginning teachers follow-up services are designed to give more emphasis to meet these needs. Barr reported the difficulties faced by beginning teachers as follows:

...control over pupils, provision for individual differences, presentation of subject matter, organization of work and teaching materials, condition for work, measuring achievement, teacher and pupil participation, making assignments and adjustment by the teacher to the classroom situation.\(^\text{26}\)

Two observations seem to be pertinent on the above list of difficulties. One is that most of these difficulties do not seem to be

\(^{24}\text{Carter W. Good (ed.), op. cit., p. 233.}\)

\(^{25}\text{Lindley J. Stiles et al., op. cit., p. 312.}\)

\(^{26}\text{Walter S. Monroe (ed.), op. cit., p. 1421.}\)
peculiar to the beginning teachers only. Such difficulties are con-
fronted by almost all teachers throughout their teaching careers. How-
ever, the difference seems to lie in the degree and make-up of the
teacher to deal with them. The second observation relates to the fact
that agriculture teachers may face most of these difficulties and more
in view of the nature of their responsibilities with young and adult
farmers, youth organizations, and supervision of occupational exper-

ences.

In spite of the importance of the follow-up activities this is
"one of the most neglected aspects of the teacher education pro-
gram,"\(^{27}\) as reported by Stiles and others. It was reported by

Shuster, Jr., that

In spite of the importance that is attached to assisting
teachers to make a good beginning, few colleges and
universities maintain systematic programs of follow-up.
This is true in the face of evidence that many promising
prospective teachers meet with such traumatic experiences
during their first year of teaching that they withdraw
from the profession.\(^{28}\)

The general purposes of follow-up program may be many but some of
these may include the following:

1. To serve as the antenna of the institution for discovering the
needs of the field and the degree to which the institution is meeting
these needs.

\(^{27}\) Lindley J. Stiles, *op. cit.*, p. 312.

\(^{28}\) Albert H. Shuster, Jr., "Supervision and the Nonprofessionally
Trained Teacher," *Educational Administration and Supervision*, 42
2. To stimulate, implement, supplement, and coordinate the efforts of the faculty and the administration in the development of institutional policy and the revision of policy, in the development of curricula and the revision of curricula offerings, in the advisement and counseling of students, all with respect to the needs of the field.

3. To serve as a means of discovering the recruiting able persons for education, in discovering opportunities for placement, in promoting graduates into positions for greater leadership, and in promoting more effective education in the field.

4. To find out from the beginning teachers how they think they are getting on with their teaching responsibilities and how they are adjusting themselves to the school and to the community.

5. To assist the graduate in evaluating his professional experience and making further professional adjustments by which he may have optimum personal satisfaction, and render maximum social service.

6. To ascertain from their immediate supervisor or proper administrative officials their version of teacher's success as a teacher and of his ability in making the necessary educational and social adjustments.

7. To give the representative visiting official from the preparing institution an opportunity to know the kind of school systems and local organizations in which teachers work and the type of communities to which teachers need to adjust themselves.
8. To provide beginning teachers with the assistance from the college with problems which they as beginning or new teachers are encountering.

9. To provide an opportunity for the visiting institutional representative to contact the beginning teacher directly to know his version of the school and of the community factors which are making for his success or failure.

10. To obtain first hand information as to how well the teacher education institution is preparing its graduates to meet their job responsibilities.

11. To relay relevant information to various departments or divisions of the teacher education institution whose main functions are to prepare the prospective teachers to meet the desired qualifications when they become in-service teachers.

The information to be obtained should not only be related to the teachers who are not measuring up to desired standards, but also in behalf of the in-service teachers who are functioning well. Such information may then be used by the supervisors of practice teaching, by the instructors in education, and by the heads of various academic departments of the college which had a part in the training of the teachers for the purpose of evaluating the efficiency of the over-all teacher education program in preparing teachers for the schools.

Most of the authorities argue that if the training institution is not the only agency responsible for follow-up of its graduates, it
certainly is the most important one. Typical of such positions was taken by Stiles and others.

Follow-up is generally considered to be a responsibility of the training institution. Such an assignment does not minimize the obligation of the employing school system to help the beginning teacher adjust satisfactorily and his professional development. Rather, it underscores the importance of the training institution extending assistance to its graduates in their initial assignments. It calls attention to the fact that the new teacher, beginning as he does with only a partial preparation for teaching, needs a helping hand learning to apply in practice and the theory and principles of teaching he learned as student trainee. For colleges to leave to chance the transfer of knowledge and skills from the pre-service program to in-service practice is to risk loss of or failure to establish professional competence of graduates.29

Practices available in the United States

All of the ten selected Departments of Agricultural Education had follow-up programs. In all cases, beginning teachers were visited by the teacher trainers. The number of visits however, varied. In two of the ten cases the visits were made for the whole day. One of the departments had the policy of visiting teachers only on their requests. Three departments organized two or three days meetings or workshops for the beginning teachers. One of these departments gave one-half unit of college credit for these short meetings or workshops.

Evidence available indicates that written policy in regard to follow-up services to be followed at West Pakistan Agricultural University has not been adopted so far.

29 Lindley J. Stiles et al., op. cit., p. 313.
In-service education

Broadly speaking "in-service education applies to all school-personnel activities which are designed to increase professional competence, but for the purpose of this study, the concept of in-service education will be limited to systematic programs promoted by the teacher training institutions in cooperation with or independent of other agencies such as provincial or state education departments or local school systems.

The following guiding statement in regard to in-service education was submitted to the members of the jury which received full support from all the members.

Personnel of the teacher education institutions and government departments of education should share responsibility of in-service education including processing and making available teaching aids and instructional material.

Importance and rationale

"Reports of research point to the need for extensive and systematic programs of in-service education." Corey emphasizing the need for in-service education stated:

That there is great need for better programs of in-service education is rarely contested...our rapidly changing culture and its implications for curriculum change, the continuing increase in pupil enrollments and numbers of teachers, the need for improved school

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31 Ibid., p. 703.
leadership, the continuous additions to our knowledge in general and particularly our knowledge about children and youth and the learning process, all, in commulation, mean that professional school people need to work continuously to keep abreast of what they must know and must be able to do. They need help, too, in form of carefully planned and creative programs of in-service education.32

Archer describing rationale for in-service education maintained that

In the past, justification for in-service education seemed to be based on the conception that teachers did not have sufficient educational preparation, lacked maturity and were inexperienced. To a certain extent this is till true...33

Archer further went on to explain that factors such as teachers holding irregular certificates, not licensed for the fields in which they are teaching, have been out of the profession for some years also partially account for the need of in-service education. According to him, need for in-service education was further emphasized by research reports which showed that local school faculty members had difficulties in working together because of conflicting philosophies of education.34

Haas writing on "In-service Education Today" concluded that

Factors such as the rapid accumulation of academic and professional knowledge, the rapid cultural changes which characterize modern times, and the importance of


34 Ibid., p. 703.
making it possible for excellent teachers to make use of their creative abilities, all argue for continuous and well planned program for professional growth.\textsuperscript{35}

Stiles and others emphasized that

The basic reasons that the teaching profession devotes an inordinate amount of time and energy to promoting programs of continuing professional development are (1) the relatively low level of preparation with which teachers begin work, (2) the differences in educational programs that prevail from school to school, (3) the impact of new knowledge upon individual courses and school curriculum, and (4) the multiplicity of unsolved professional problems that confront teachers.\textsuperscript{36}

Authors of \textit{New Horizons for the Teaching Profession} took the view that

\begin{quote}
Pre-service preparation...is designed to produce a person ready to begin to teach or carry out a special service function. In this view, basic preparation for service to the profession is not considered to be complete until study is combined with experience. Provision is made for gradual induction into full teaching responsibility through the internship. This first teaching experience is considered a part of the pre-service program of professional preparation, but it is required that the preparing college and the school work closely together as the student starts in-service education as a part of his internship. By school and college working together, the beginners competence and limitations can be interpreted as those reasonably expected of the educator at this stage of his development. In-service education continues beyond the probationary period years and is "developmental" in nature. The needs of individuals, as persons and as educators change with years of experience and further education.\textsuperscript{37}
\end{quote}

\textsuperscript{35}C. Glen Haas, "In-service Education Today" in the Fifty-sixth Yearbook, \textit{op. cit.}, p. 33.

\textsuperscript{36}Lindley J. Stiles \textit{et al.}, \textit{op. cit.}, p. 308.

It is generally assumed that most, if not all, teacher education institutions recognize an obligation to devote some of their energies to the in-service education of personnel in school. As a matter of fact, Maucker and Pendergraft argue that, "This point scarcely seems worth laboring, since extension and field service programs for this purpose exist in such profusion." Writing on the contributions of teacher education institutions to the cause of in-service education, Stiles and others maintained that

Institutions for teacher education have assumed considerable responsibility for helping improve the professional competence of teachers in-service. Their efforts usually have been pointed toward providing extension and summer courses; organizing institutes, conferences, study groups; and less frequently, stimulating teacher participation in research.

In addition, the training institution's role in the development of the proper attitude and abilities among its trainees seems to be equally significant. If the trainee leaves the training institution with an insatiable desire to grow continuously and is also equipped to do so, the institution seems to have realized one of its main objectives. Some of such measures may include the following:

1. Placing increasing responsibility on the learners in the undergraduate program through such means as seminar experience, library projects, term papers, and self evaluation.

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38 J. W. Maucker and Daryl Pendergraft, "Implications of In-service Educations Programs for Teacher Education Institutions" in The Fifty-sixth Yearbook, op. cit., p. 264.

39 Lindley J. Stiles et al., op. cit., p. 376.
2. Using comprehensive examinations at strategic points in the undergraduate program, thus leading students to accept responsibility for synthesizing their knowledge, relating the work of various individual courses and other isolated items in their educational experience.

3. Providing direct instruction in the use of library and other tools of research and independent study and encouraging students to build their own personal libraries.

4. Making long range assignments which lead students to seek information from a wide variety of sources, use standard reference materials, become familiar with current professional literature.

5. Striving to assure for students sufficient scope and depth in their teaching and professional fields so that they are able to pursue study on their own.

6. Requiring students to gain experience in building units of instruction and utilizing materials appropriate for school students.

Conclusions and recommendations

As available at present at the West Pakistan Agricultural University, the placement office may continue to function as a centralized office in the University. In most of the ten selected institutions placement services were generally provided through a centralized office in the University. However, the Departments of Agricultural Education extended their active full support and cooperation to these offices. Some evidence indicates that in some universities in the United States, placement services are provided on decentralized basis but they are

---

much larger in size as compared to West Pakistan Agricultural University at Lyallpur.

It is further recommended that the head of the placement office should be adequately professionally trained to provide leadership to make placement services useful, efficient and rewarding in light of modern theory and practice.

It is further suggested in view of the professional nature of these services and to supplement the efforts of the placement offices, that the operational policy should not only allow but encourage professional faculty members of the Teacher Training Department to provide cooperation, efforts and initiative in the provision of placement services.

The Department of Teacher Training in the Agricultural University, Lyallpur should initiate, develop, and promote an active and efficient program of follow-up of its graduates in cooperation with the Provincial Education Department.

In the area of in-service education, the Department of Teacher Training at Lyallpur should promote both group processes as well as individual self-improvement as basic approaches to in-service education. Improvement through group processes should be attempted with the help and cooperation of other agencies such as Provincial Education Department and other professional agencies and organizations. Providing instructional material to teachers seems to be another fruitful area in which the Department of Teacher Training should work with the Provincial Education Department.
In the area of individual self-improvement the Department should educate prospective agriculture teachers so that they will accept the professional obligation to continue to learn on the job and will be equipped with the required abilities and skills to do so.

The need and possibility of instituting summer courses for credit should be explored with the help and cooperation of other related agencies and organizations. If need is established, such courses should be promoted.

Reaction of the jury

All the members of the jury totally agreed with all the recommendations made in regard to placement, follow-up, and in-service education.
CHAPTER VI

SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

The West Pakistan Agricultural University at Lyallpur was initiated in the beginning of the year 1962. It accepted as one of its responsibilities the training of agriculture teachers for secondary schools. Consequently, the University established a Department of Teacher Training in 1963. The department is still in the early stage of development including the organization of courses and development of facilities. Most of the professional staff who would serve in the department is receiving higher education in the United States. The writer is one of this staff.

This study was designed to develop a program of pre-service education of agriculture teachers at West Pakistan Agricultural University, Lyallpur. It was thought that such a study could serve a useful purpose in the development of the department and could also provide guidance if such training facilities are to be multiplied by the West Pakistan Government at other places in the West Pakistan province.

The study was limited to such aspects of teacher education program which generally constitute a pre-service education program. These include selection and recruitment, curricula, and professional laboratory experiences. Each of these three aspects has been dealt with in detail in separate chapters. It was, however, believed that the responsibility
of the training institution is not complete with the graduation of the teachers. Therefore, brief attention was also given to placement, follow-up, and in-service education. These three topics have been discussed in one chapter. None of the recommendations made seem to be outside the jurisdiction of the University and if implemented will not involve a great amount of money. Therefore, it is expected that in case these recommendations are acceptable efforts would be made to implement them.

Dr. Robert E. Taylor, Director, Center for Research and Leadership Development in Vocational and Technical Education, The Ohio State University, and Dr. Duane Neilson of the United States Office of Education were asked to identify ten Departments of Agricultural Education in the United States which could give certain ideas and insights to the writer to be used in this study. The two gentlemen agreed on the following ten institutions.

1. The Ohio State University, Columbus, Ohio
2. The University of Illinois, Urbana, Illinois
3. The Colorado State University, Fort Collins, Colorado
4. The University of California, Davis, California
5. The California State Polytechnique College, San Luis Obispo, California
6. The North Carolina State University, Raleigh, North Carolina
7. The Iowa State University, Ames, Iowa
8. The Pennsylvania State University, University Park, Pennsylvania


The programs of these institutions as related to teacher preparation were studied through printed material. This was supplemented by having head teacher trainers fill in survey forms which were designed for the purpose of this study. This was followed by visits by the writer to all the ten departments. This opportunity was availed to hold discussions with the faculty of the department and in most of these cases with some other administrative officials of the universities. At many of these places visits were also made to certain teaching centers and other pilot projects. These programs and practices were then analyzed to identify some characteristics and practices which were considered important and significant for the West Pakistan Agricultural University at Lyallpur.

A list of sixteen guiding statements was developed from the literature. These statements related to the development of various functions of teacher education programs which were included in this study. These guiding statements were submitted to five members of a jury for their reaction. These statements, with minor changes and modifications approved by the members of the jury, were used in the development of this teacher education program. Recommendations made as a result of this study were also submitted to the members of the jury. These guiding statements were:

1. The department should conduct a program of recruiting students in order to insure an ample regular supply of teachers of agriculture in West Pakistan.
2. Selection of students should be such that only those exhibiting qualities and competencies associated with good teachers are certified to teach.

3. Adequate facilities should be available to provide proper conditions and environment for conducting needed instruction.

4. All contacts with students, the nature of teaching, the learning situation, and the methods of teaching should be considered essential part of curriculum.

5. Opportunities and experiences should be provided students for the development of their personal, social and professional qualities.

6. Individual differences should be recognized and the curriculum should be flexible enough to meet specific individual problems and needs.

7. The teacher education program should be functional and practical rather than merely academic in nature.

8. Teachers of agriculture should have at least as much of the same kind of general education as is provided graduates who enter in other professions and occupations.

9. The pre-service education curriculum should enable students to acquire such attitudes, understandings, appreciations and knowledge of the physical and biological sciences as are essential in analyzing and solving agricultural problems.

10. The curriculum should enable students to acquire such technical knowledge and skill in plant and soil sciences, animal science,
agricultural economics, rural sociology, and agricultural mechanics as are necessary to initiate and promote a good program of agriculture.

11. The prospective teacher should have a thorough knowledge of the learner and the learning process and some introduction to methods and materials and curriculum organization.

12. The prospective teachers should have some minimum period of student teaching under typical conditions under competent supervision, as is needed to develop initial confidence and competencies required to plan, teach and conduct a good program of agriculture and to apply theoretical knowledge to actual teaching situations.

13. Even the best possible pre-service educational program cannot produce beginning teachers who are fully competent in all respects of their work. Therefore, efficient and regular follow-up program should be provided.

14. Personnel of the teacher education institutions and government departments of education should share responsibility of in-service education including processing and making available teaching aids and instructional materials.

15. Teacher education institutions should make provisions for conducting research essential to the program of vocational agriculture and agricultural education.

16. Teacher education institutions should cooperate with regional, provincial and national organizations, groups and individuals, concerned with the welfare and promotion of education and agriculture.
17. The Teacher Education Department should make provisions for continuous appraisal of changes and for making adaptations to meet changing conditions.

Each of the aspects of teacher preparation included in this study except placement, follow-up and in-service education has been discussed in a separate chapter. It may not be construed from this that these aspects are independent of each other. On the other hand, it is to be emphasized that each aspect is so intimately related to each other that in most of these cases realization of the objectives of one is very difficult to be achieved without the implementation of the recommendations of the others. This chapter is an attempt to present all the recommended programs in one package.

Selection and recruitment

Evidence presented in Chapter II indicates that in most of the teacher preparing institutions some selection and recruitment was practiced. However, the techniques varied in different institutions. One factor which complicated the situation was that there was lack of any reliable and valid criteria and instrument for the selection of prospective teachers. In the ten selected Departments of Agricultural Education, eight prescribed certain qualifications at the time of entry into agricultural education beyond college or university requirements. Most of such factors included minimum grade point average, interview with the departmental committee, speech efficiency, physical fitness, and some experience in farming or other agricultural pursuits.
Two questions were considered before making any recommendations for West Pakistan Agricultural University, Lyallpur. One was whether there should be any selection at all at the time of entry into agricultural education. And the second was that if there should be, then what should be the method and criteria. Considering merits and demerits of having selection, it was suggested that there should be selection. The writer was fully cognizant of the fact that selection could lead to one of the two errors. One was that it would eliminate those students who could succeed if given the opportunity and second was that it would admit those candidates who would fail or hardly succeed in the teacher preparation program. In both of those cases, however, both the individual and the society would lose something. But the loss in the latter case would perhaps be more.

No valid and reliable criteria and instruments were available. Therefore, time honored and widely practices steps were suggested. It was recommended that the students should have at least "C" average or equivalent grade point average, physical fitness to be checked by the medical officer, about two years experience on farm or related pursuit either as prerequisite to admission to professional program or obtained during program, and an interview with the Departmental Committee. All of these qualifications are to be met at the time of admission to the professional program.

In order to attract suitable candidates in adequate number, it was suggested that a systematic recruitment program should be instituted both at the university level as well as at the department level. One
of the staff members of the department should be designated to give leadership to this program at the department level and active cooperation at the university level. The practices for recruitment adopted by the ten selected departments varied. But the most common were involvement of agriculture teachers, development and distribution of printed material showing challenges, prospects, and opportunities involved in the profession, inviting prospective trainees to visit the campus facilities and attend recruitment meetings, visiting and talking to the students and their parents. It was felt that many of these activities can be followed at the University.

**Curriculum**

On examination of the outlines of courses required at West Pakistan Agricultural University, Lyallpur, it was found that all the areas traditionally and widely thought to be contributing to the objectives of general education were not represented in the general education program. If the first two years at the University being common and required of all students were taken as representing general education, it was found that the time devoted compared very favorably to the practices available in the United States.

Therefore, it was suggested that the time devoted to general education area at present at Lyallpur might continue but it was recommended that general education area should have representation from physical sciences, biological sciences, social sciences and humanities. The objectives of each course should be identified for the guidance of
the instructor. These objectives should clearly aim toward the realization of general education objectives.

It was found that 51.8 per cent of total five year program was devoted to the area of specialization at Lyallpur. This was about 15 per cent more than average requirements in the ten selected institutions in the United States.

On the other hand it was found that professional education as well as electives constituted 7.6 per cent of total five years period at Lyallpur which was 18.0 per cent less than average requirements in the ten selected institutions.

Therefore, it was suggested that more time should be given to professional education and electives. The area of specialization might be given about 45 per cent of the total period and time thus saved should be given to professional area and electives. The suggested division may thus be approximately general education 40 per cent, area of specialization 45 per cent, and professional area and electives 15 per cent.

It was also suggested than on declaration of major, the student should be allotted an advisor in his major field who could guide student's later academic developments. It was recommended that students should be encouraged to decide about their major field as soon as possible but not later than the third year at the university.
Professional laboratory experiences

It was found that college credit given for student teaching at Lyallpur was about the same as average college credit given in the ten selected institutions. Therefore, no major deviation from the existing practice at Lyallpur was suggested. Details of the organization of student teaching practices at Lyallpur were not available. But it was suggested that student teaching should be done in the laboratory school which is being provided on the campus as well as under typical conditions in the community. The student teaching in the community should be fulltime for about ten weeks. This will approximately match the practices available in the ten selected departments. It was also suggested that while the student teacher is doing his fulltime teaching in the community he may also be asked to do study of the community.

In order to provide experience in most of the activities of the agriculture teacher, it was suggested that the scope of the student teaching should be enlarged to include other experiences of the responsibilities of the agriculture teacher which would not be available at the time of student teaching. It was thought desirable for the prospective agriculture teacher to be given some field experience in extension. It was considered quite likely that either the agriculture teacher may have the opportunity to do some extension work in the community or he might work cooperatively with an extension agent (agricultural assistant) on some projects. In either or both of these situations, this experience would be helpful.
In most of the ten selected institutions in the United States it was found that cooperating teachers were provided some financial incentive. Under the available practices in West Pakistan cooperating teachers in other school subjects were not provided any financial compensation. It was, therefore, felt that such incentive to agriculture teachers might create some administrative difficulties both in the schools as well as in the other training institutions. Therefore, it was suggested that no financial aid be given to agriculture cooperating teachers.

It was, however, recommended that student teachers should be given some compensation. Student teaching is similar to other laboratory experiences. Expenditure in the laboratory is subsidized by the institutions in West Pakistan to a great extent as tuitions and laboratory fees are very meager as compared to the expenditure.

**Placement**

With regard to organization of placement services, practices were found to differ in the teacher education institutions in the United States. Some were centralized and some were decentralized. There was some evidence that larger institutions tended to be decentralized and comparatively smaller ones were mostly centralized. However, the Departments of Agricultural Education in the ten selected institutions were found extending active cooperation to the centralized office for placement services.

It was suggested that in view of the comparatively smaller size, the West Pakistan Agricultural University should provide centralized
office for placement. However, the head of this office should be ade-
quately professionally trained to give suitable leadership to this im-
portant area. The operational policy should be such as to encourage 
the professional staff of the Department of Teacher Training to sup-
plement the efforts of the placement office.

Follow-up

It was found that all the ten selected departments had follow-up 
programs of their graduates although their practices varied. It was, 
therefore, recommended that a follow-up program of the university should 
be initiated and promoted. This might be left to the Department of 
Teacher Training who should do it with the help and assistance of the 
University authorities as well as with the cooperation and help of the 
West Pakistan Education Department. The follow-up activities should 
include visiting of beginning teachers by the teacher trainers, holding 
of short meetings off or on campus, and providing instructional ma-
terial and aids.

In-service education

It was concluded that there was great need for a regular and sys-
tematic program of in-service education. The West Pakistan Government 
has already provided an Education Extension Center which was set up to 
institute and promote systematic program of in-service education for 
all the professional personnel of the Provincial Education Department 
and schools. The second objective of the establishment of the Center 
was to give leadership in the development of comprehensive schools.
It was therefore suggested that the Department of Teacher Training at Lyallpur should actively cooperate with the Provincial Education Department (which includes Education Extension Center) and other professional agencies and organizations. The in-service education activities should not only include credit and non-credit courses, workshops, meetings, conferences, symposia and others, but production and distribution of instructional material and aids should also be promoted.

Other recommendations

The personnel of the Department of Teacher Training should continuously engage in the evaluation of its policies, practices and programs and recommend any changes if the circumstances so demanded. This is to be done with the help of systematic studies and research. Such evaluation will generally require the cooperation and assistance of other departments and administration of the University, West Pakistan Education Department, and many other agencies and organizations. Therefore, the Department of Teacher Training should always strive for the active cooperation and assistance of all those concerned directly or indirectly with the preparation and employment of agriculture teachers.

Conducting research is generally regarded as one of the major functions of professional staff of a university. This should be so at West Pakistan Agricultural University, Lyallpur. It is suggested that the Department of Teacher Training should promote research by
graduate students, by individual faculty members and in cooperation with other groups, organizations and individuals both within and outside the University. The agriculture teachers in the field should also be involved. The department should see that findings of research are diffused to the persons and agencies concerned in an appropriate form.
<table>
<thead>
<tr>
<th>Organisational Chart</th>
<th>West Pakistan Agricultural University</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chancellor</td>
<td>Vice-Chancellor</td>
</tr>
</tbody>
</table>

- **University Authorities**
  - Boards of Studies
  - Faculties
  - Committee for Advanced Studies and Research
  - Academic Council
  - Syndicate
  - Planning Development Committee

- **Department of Agriculture**
  - Dean Faculty of Agriculture
  - Dean Faculty of Animal Husbandry
  - Dean Faculty of Veterinary Science

- **Department of Economics & Rural Sociology**
  - Dean Faculty of Agricultural Economics & Rural Sociology Including Co-Operation

- **Department of Basic Sciences and Arts**
  - Director Division of Basic Sciences and Arts
  - Director Institute of Teacher Training Extension and Short Courses

- **Departments of Departments of Departments**
  - Soil Science
  - Livestock Management
  - Anatomy and Histology
  - Agricultural Economics
  - Basic Engineering
  - Botany
  - "Extension" Advanced

  - Plant Breeding and Genetics
  - Animal Breeding and Genetics
  - Clinical Medicine and Surgery
  - Rural Sociology
  - Agricultural Engineering
  - Zoology
  - Short Courses

  - Agronomy
  - Animal Nutrition
  - Physiology and Pharmacology
  - Co-Operation and Credit
  - Irrigation and Drainage
  - Chemistry

  - Horticulture
  - Poultry Husbandry
  - Pathology and Bacteriology
  - Agricultural Marketing
  - Food Technology
  - Physics and Meteorology

  - Plant Pathology
  - Livestock Farm
  - Parasitology
  - Farm Management
  - Fibre Technology

  - Forestry, Range Management and Wildlife
  - Artificial Insemination Cell
  - Agricultural Law Cell
  - Dairy Technology
  - Social Sciences and Humanities

  - Entomology
  - Human Nutrition Cell
  - Cereal Technology
  - Religious Teaching

  - University Farms
  - Oil Technology
  - Urdu Cell
APPENDIX II

Instrument Designed to Get Selected Information
From the Departments of Agricultural Education

Name of the Institution __________

1. Number of students completing the following degree programs in your Department during 1964-1965.
   a. Bachelor's degree __________
   b. Master's degree __________
   c. Doctorate degree __________

2. Number of instructional staff (full time equivalent) __________

3. On an average what is the division of time of the instructional staff:
   a. Teaching _________%
   b. Research _________%
   c. Others _________% (Please specify)

4. On an average what is the number of students assigned per staff member in agricultural education.
   a. graduates __________
   b. undergraduates __________

5. What guidance facilities are available to agricultural education majors (both preselection and after selection)?
6. What qualifications are required of students selecting agricultural education as major beyond college or university requirements?

7. What is the total number of semester hours (or equivalent quarter hours) required for:
   1. graduation ___________
      a. general education ___________
      b. area of specialization ________
      c. professional education _________
      d. free electives ______________

8. When do students generally declare their major? ________________

9. When do students generally take first course in professional education? __________________

10. Number of weeks agricultural education major are required to do their student teaching ____________.

11. When do they do their student teaching? __________________

12. Is their student teaching full time? Please explain.

13. Do the students live in the same community during the period of their student teaching? ______________

14. How many credits are given for student teaching? ____________

15. Average number of students placed in each teaching center? ______

16. Average number of students assigned per cooperating teacher at a given period? _____________
17. What benefits do cooperating teachers receive?

18. Do students receive any benefits, such as mileage allowance, and etc.? If yes, what?

19. What are the criteria for the selection of cooperating center?

20. Who selects the centers?

21. Number of weeks field experience in addition to student teaching is required.
   a. Summer experience __________
   b. September experience ________
   c. Any other ____________________

22. Number of times, on an average, each student is visited by the teacher trainer during clinical experiences? ____________

23. What placement facilities and procedures are available in the Department of Agricultural Education?
24. What procedures are utilized for coordinating teacher training with supervision of vocational agriculture?

25. What follow-up methods are used?

26. Are there any significant changes in the present pre-service program for preparing teachers of vocational agriculture which you want to put into immediate effect? If yes, please explain the nature of these changes and why.

27. Please explain in detail any unique features of your program which you feel have been especially valuable. Please do not be overly modest. I am more interested in the best features of the program of your department.

28. Assuming there are no limitations, such as funds, personnel, administration, and regulation. What additions or changes would you like to make in the available program for the preparation of vocational agriculture teachers?
APPENDIX III

July 12, 1965

Dear ________

Mr. Tanweer A. Lodhi, a graduate student from Pakistan, is pursuing a Ph.D. degree program in our department. For his dissertation he is planning to develop a pre-service program of education for teachers of vocational agriculture at the Agricultural University, Lyallpur, West Pakistan. In order to get more background about programs in agricultural education he is planning to visit selected departments throughout the United States. Yours is included in this selected list.

According to the enclosed itinerary he is planning to visit your department on August 20 or 21. We are hopeful that it will be convenient for you or some member of your staff to discuss the teacher education program with him. Likewise, if possible, he would like for you to arrange for a short visit with the Dean of your college or some member of the Dean's staff who knows about the relationship of agricultural education in the college and university.

Also enclosed is an instrument which Mr. Lodhi has developed for the purpose of securing selected information about your department. We shall appreciate your having this material available at the time of his visit.

Please use the enclosed card to indicate the time during the day when it will be convenient for Mr. Lodhi to visit your department. Thanks a million for your consideration and help.

Sincerely yours,

Ralph E. Bender, Chairman
Department of Agricultural Education

Enclosures
APPENDIX IV

Itinerary of Mr. Tanweer A. Lodhi, Graduate Student at
The Ohio State University

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Action</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>July 25</td>
<td>Columbus</td>
<td>Leave</td>
<td>8:00 A.M.</td>
</tr>
<tr>
<td></td>
<td>Urbana, Illinois</td>
<td>Arrive</td>
<td>3:45 P.M.</td>
</tr>
<tr>
<td>July 26</td>
<td>Urbana</td>
<td>Stay</td>
<td></td>
</tr>
<tr>
<td>July 27</td>
<td>Urbana</td>
<td>Leave</td>
<td>4:10 A.M.</td>
</tr>
<tr>
<td>July 27</td>
<td>Ames, Iowa</td>
<td>Arrive</td>
<td>7:25 P.M.</td>
</tr>
<tr>
<td>July 28</td>
<td>Ames</td>
<td>Stay</td>
<td></td>
</tr>
<tr>
<td>July 29</td>
<td>Ames</td>
<td>Leave</td>
<td>12:40 P.M.</td>
</tr>
<tr>
<td>July 30</td>
<td>Fort Collins, Colorado</td>
<td>Arrive</td>
<td>10:54 A.M.</td>
</tr>
<tr>
<td>July 31</td>
<td>Fort Collins</td>
<td>Stay</td>
<td></td>
</tr>
<tr>
<td>August 1</td>
<td>Fort Collins</td>
<td>Leave</td>
<td>10:54 A.M.</td>
</tr>
<tr>
<td>August 2</td>
<td>Davis, California</td>
<td>Arrive</td>
<td>5:50 P.M.</td>
</tr>
<tr>
<td>August 3</td>
<td>Davis</td>
<td>Stay</td>
<td></td>
</tr>
<tr>
<td>August 4</td>
<td>Davis</td>
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<td>9:40 A.M.</td>
</tr>
<tr>
<td>August 4</td>
<td>San Francisco, Calif.</td>
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<td>12:15 P.M.</td>
</tr>
<tr>
<td>August 5-7</td>
<td>San Francisco</td>
<td>Stay</td>
<td></td>
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<tr>
<td>August 8</td>
<td>San Francisco</td>
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<td>8:30 A.M.</td>
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<tr>
<td>August 8</td>
<td>San Luis Obispo</td>
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<td>1:45 P.M.</td>
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<tr>
<td>August 9</td>
<td>San Luis Obispo</td>
<td>Stay</td>
<td></td>
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<tr>
<td>August 10</td>
<td>San Luis Obispo</td>
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<td>8:30 A.M.</td>
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<tr>
<td>August 10</td>
<td>Los Angeles</td>
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<td>3:00 P.M.</td>
</tr>
<tr>
<td>August 11-12</td>
<td>Los Angeles</td>
<td>Stay</td>
<td></td>
</tr>
<tr>
<td>August 13</td>
<td>Los Angeles</td>
<td>Leave</td>
<td>8:00 P.M.</td>
</tr>
</tbody>
</table>

149
<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Action</th>
<th>Time</th>
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<tbody>
<tr>
<td>August 15</td>
<td>Dallas, Texas</td>
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<tr>
<td>August 16-17</td>
<td>Dallas</td>
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<td></td>
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<tr>
<td>August 18</td>
<td>Dallas</td>
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<td>12:30 P.M.</td>
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<tr>
<td>August 20</td>
<td>Raleigh, North Carolina</td>
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<td>5:35 A.M.</td>
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<tr>
<td>August 21</td>
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</tr>
<tr>
<td>August 22</td>
<td>Raleigh</td>
<td>Leave</td>
<td>12:01 P.M.</td>
</tr>
<tr>
<td>August 22</td>
<td>Washington, D.C.</td>
<td>Arrive</td>
<td>6:55 A.M.</td>
</tr>
<tr>
<td>August 23-24</td>
<td>Washington, D.C.</td>
<td>Stay</td>
<td></td>
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<tr>
<td>August 25</td>
<td>Washington, D.C.</td>
<td>Leave</td>
<td>2:00 P.M.</td>
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<tr>
<td>August 25</td>
<td>State College, Penn.</td>
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<td>8:11 P.M.</td>
</tr>
<tr>
<td>August 26</td>
<td>State College</td>
<td>Stay</td>
<td></td>
</tr>
<tr>
<td>August 27</td>
<td>State College</td>
<td>Leave</td>
<td>8:05 P.M.</td>
</tr>
<tr>
<td>August 28</td>
<td>New York</td>
<td>Arrive</td>
<td>5:30 A.M.</td>
</tr>
<tr>
<td>August 29-30</td>
<td>New York</td>
<td>Stay</td>
<td></td>
</tr>
<tr>
<td>August 31</td>
<td>New York</td>
<td>Leave</td>
<td>9:15 A.M.</td>
</tr>
<tr>
<td>August 31</td>
<td>Ithaca</td>
<td>Arrive</td>
<td>3:50 P.M.</td>
</tr>
<tr>
<td>September 1-2</td>
<td>Ithaca</td>
<td>Stay</td>
<td></td>
</tr>
<tr>
<td>September 3</td>
<td>Ithaca</td>
<td>Leave</td>
<td>6:50 A.M.</td>
</tr>
<tr>
<td>September 3</td>
<td>Niagra Falls</td>
<td>Arrive</td>
<td>12:38 P.M.</td>
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<tr>
<td>September 4</td>
<td>Buffalo</td>
<td>Leave</td>
<td>11:30 A.M.</td>
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<tr>
<td>September 4</td>
<td>East Lansing, Mich.</td>
<td>Arrive</td>
<td>9:45 P.M.</td>
</tr>
<tr>
<td>September 7</td>
<td>East Lansing</td>
<td>Stay</td>
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<tr>
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</tr>
<tr>
<td></td>
<td>Columbus</td>
<td>Arrive</td>
<td>6:45 P.M.</td>
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APPENDIX V

Outline of Course for the First Two Years

First Year

English I - English Grammar and Composition (5-0)

Review of basic English and elementary grammar; emphasis on the mastery of an active vocabulary and basic sentence structure; introduction to the art of writing simple subjects; assigned reading and evaluation of selected literature; translation of selected articles from English to Urdu and vice versa.

Math 1 - Mathematics (5-0)


Different Calculus: definition of constant, variable and function, limits of algebraic and trigonometric functions, definition of differentiation and differential co-efficients, differentiation of the following functions from first principle, \( x \sin x, \cos x, \tan x, \sec x, \cosec x, \cot x, \log x \), fundamental theorems on differentiations of Y-C, Y-U-V, Y-UV, Y-U/V, differentiation of simple algebraic, trigonometric, exponential and logarithmic functions; Integral calculus: definition of integration, integration of the following types, \( x^n \, dx, ax \, dx, (ax-b) \, dx, \sin x \, dx, f/(x)/f(x) \, dx, axdx, exax, dx, ax \, dx \), simple definite integrals.

Zool 1 - Zoology (2-2)

General Biology: Scope and definition of Biology. Characters and properties of living and non-living matter. Protoplasm: its physical

Practicals


Botany 1 - Botany (2-2)

Definition and scope of Biology: Origin of life, living and non-living; Cell concept: its structure and function; Branches of Botany and classification of plant Kingdom; Seeds: study of internal and external structure and form of cotton, gram, castor, wheat and maize seeds their germination, conditions necessary for germination.

Characteristics and functions of root systems; Stem: general characteristics and functions, aerial, sub-aerial and underground stem; Branching systems; Bud types, Leaf: simple and compound leaves; shapes of lamina, its modifications with significance; Phyllotaxy.

Flower: Its parts; calyx, corola, androecium and gynaecium, placentation; Floral formula and floral diagram, flower is a midified shoot; Inflorescence; its racemose, cymose, compound mixed and special forms; Fruit; study of general classification, simple, dry, one seeded, many seeded, fleshy, aggregate and composite fruits; Pollination and fertilization.
Introduction to Taxonomy; Characteristics of families; panunculaceae; Solonaceae; Compositae; Leguminosae, Cruciferae, Cucurbitaceae and Gramineae with one representative plant. Plant functions, effect of environmental factors on plant life. A brief introduction to transpiration; Photosynthesis and respiration; Hydrophytes; Xerophytes and mesophytes; Effect of light, temperature and topography on the plant.

Practicals

Structural and germination studies of cotton, gram, castor, wheat and maize seed; use of microscope and study of cell and its inclusions i.e., starches of maize, rice, barley, potato and wheat; Raphides and Sphaeraphides.

Study of root systems; Aerial, sub-aerial, and underground stems, its branching; Bud types, Scheme for description of leaves, phylotaxy; Flower: calyx, cololilia and roccium, cynae ceum; Scheme for flower description; Inflorescence; Fruits; Pollination and fertilization.

Chem. 1 - General and Inorganic Chemistry (5-4)

Introduction of chemistry as a science, chemical symbols, formulae, valence, radicals, empirical and molecular formulae; Elements, compounds and mixtures; Laws: chemical combination and gas diffusion; Avogadro's hypothesis, chemical equations; Molecular weight (Victor Meyer's methods and diffusion method), equivalent weight, atomic weight; Atomic structure; Dalton's theory and the modern views; Electrovalent, covalent bonds Calculations based on chemical equation; Theory of ionization; acids, bases and salts; Solutions and colloids; Electrolysis, electroplating, catalysis.

Non-metals: Study of hydrogen, oxygen, ozone, water, hydrogen peroxide, oxidation and reduction; Chlorine, bromine, iodine; Hydrochloric acid, hydrob romic acid, hydrolic acid, and bleaching powder; Sulphur, hydrogen sulphide, sulphur dioxide, sulphur trioxide; Properties and uses of sulphuric acid; Nitrogen and Nitrogen cycle in nature; Ammonia, nitrous and nitric oxides; Nitrous acid, nitric acid; Phosphorus; match industry, phosphorus trichloride and phosphorus pentachloride, phosphoric acid. Allotropic forms of carbon, oxides of carbon, carbon dioxide-cycle in nature, carbon disulphide; Fuel gases, coal gas and oil gas; Study of Silica and water glass, boric acid and borax.

Metals: extraction of metals from minerals and their ores; Study of: sodium, copper, silver, mercury, zinc, aluminium, tin, lead and iron; Preparation and uses of important sodium potassium and ammonium compounds, copper sulphate, bordeaux mixture; Silver nitrate; Zinc oxide, chloride; Plumbous oxide, red lead, white lead; Ferrous sulphate, potassium ferrocyanide, potassium ferricyanide; Magnesium sulphate; Calcium oxide, calcium hydroxide, calcium carbonate; Mercuric chloride,
mercuric iodide; Potassium chromate, potassium dichromate; Potassium permanganate and Nessler's reagent; Study of photography, silvering of mirrors, soldering and tinning, wrought iron and steel.

Practicals

General exercises: study of laboratory reagents and apparatus; Study of burners; Fitting up on wash bottle; Preparation and properties of Hydrogen sulphide gas; Preparation and properties of chlorine gas.

Gravimetric Analysis: percentage loss on heating of a given substance; Number of molecules of water of crystallization; Equivalent weight of copper by oxidation; Determination of equivalent weight of magnesium by hydrogen displacement method; Simple exercises involving the processes of crystallization, sublimation, solution and filtration; Separation of the given mixture containing ammonium chloride, sodium chloride and sand; Preparation of crystals of impure sample of copper sulphate and potassium nitrate.

Qualitative Analysis: detection and confirmation of simple salts of the following radicals both by dry and wet tests; carbonates, bicarbonate, sulphites, thiosulphates, sulphones, nitrates, nitrites, bromides, iodides and chlorides, acetates and oxalates, sulphates, phosphates and borates.

Detection and confirmation of simple salts of the following radicals both by dry and wet tests; lead, silver, mercury, copper, tin, antimony, iron, aluminium, zinc, manganese, calcium, barium, magnesium, sodium, potassium and ammonium.

Volumetric Analysis: simple volumetric exercises dealing with acidimetry and alka limetry; determination of: normality and strength of the given solution of sodium hydroxide, equivalent weight of an alkali solution of known strength, basicity or acidity of a given solution of known strength of an acid or a base, molecular weight of an acid solution of known strength, water of crystallization in oxalic acid crystals the solution of which is provided, solubility of sodium carbonate, percentage purity of sodium hydroxide, percentage composition of a mixture containing one inert and the other active substance.

Oxidation and reduction exercises dealing with permanganate titrations: standardization of the given potassium permanganate solution with oxalic acid, determination of: percentage purity of the given partially oxidised sample of ferrous sulphate, number of water molecules in ammonium oxalate, percentage of ferrous sulphate in Mohr's salt; Silver nitrate titrations dealing with the estimation of chloride ions in neutral solution: determination of: normality of sodium chloride solution, percentage purity of an impure sample of common salt the solution of which is given, analysis of tap water for chloride,
solubility of sodium chloride at room temperature, percentage composition of mixture containing sodium chloride and sodium nitrate; Miscellaneous titrations: determination of: percentage of potassium chloride in a solution containing sodium hydroxide, percentage composition of mixture containing potassium sulphate and ferrous sulphate solutions.

Agri 1 - Agronomy and Farm Operation (3-6)

History and scope of agronomy, importance of field crops in agriculture, relationship to allied sciences; Crop production factors including seasonal changes, temperature, rainfall, frost, hail, wind and dew; The effect of latitude on varieties of crop; development of soil and general classification, minerals and weathering agents, soil temperature and aeration as related to field crop production; Types of soil moisture, water movement in soil, textural effect on water movement, irrigation practices, irrigation systems, water requirement of field crops and importance of drainage systems; Characteristics of saline and sodic soils; Cultivation for weed control and types of weeds; Control of soil erosion by water and wind; Soil tillage; seed, bed preparation types of cultivating implements, animal powered equipment, mechanize equipment, tools for crop cultivation and seeding machines.

Practicals

Discussion and demonstration with maps of cropped areas of West Pakistan with reference to irrigated and rainfed areas. Demonstration and interpretation of meteorological data. Measurement of land, units of land measurement; Demonstration and practice in planning irrigation distribution system for farm fields, bund constructed by machines and hand tools, irrigation frequency and schedules; Demonstration and practice with tillage implements, animal powered and mechanized; Methods of adjusting and determining suitability; Practice in recognizing field crops, weeds, noxious and annual; Soil differences; saline and waterlogged lands. Each student will cultivate an area of land not less than 1/16 acre and grow "Rabi" and "Kharif" crops. Work on crops will be done entirely by students. Records of production will be handed in for practical award. Tour of various agric, farms and waterlogged areas, soil erosion projects, etc.

Second Year

Eng 2 - Communication Skills (4-0)

Training in the skills of reading, writing and speaking with emphasis on vocabulary-building, comprehension of both spoken and written English, the mechanics and organization of communication both oral and written.
Plant Physiology: introduction of plant physiology, and review of cell structure; Chemical composition of plants; Role of different elements in plant body; Water culture experiments; Colloidal Systems—Soils and gels; Diffusion; Osmosis and osmotic pressure; Imbibition; Plasmolysis and cytoplasmic movement; Mechanism of absorption of water by plants; Mechanism of absorption of salts by plant; Translocation of water and salts of plants; Transpiration and methods of measuring rate of transpiration; Factors affecting the rate of translation; Theories of ascent of sap photo-synthesis as a process and its importance; Mechanism and theories of photosynthesis; Factors affecting photo-synthesis; Respiration—aerobic and anaerobic and their experimental proof; Mechanism of respiration; Glycolysis; Kreb's Cycle; Fermentation; Photosynthesis; Respiration; Physiology of growth; Factors affecting vegetative growth factors affecting reproductive growth; Photoperiodism; Vernalisation; Plant tropism; Dormancy, Causes of Dormancy; Methods of breaking dormancy in seeds and buds.

Plant Ecology: plant ecology and its scope; The web of life; Autecology and synecology; Definition of Terms used in plant ecology; Quantitative measures of vegetation; list quadrats; Transects; Line Transect, belt transects, Bisects; the Migration Circle Camera Sets; Ring counts; uts of vegetation; Plant succession; ression; Ecosis; Competition and invasion; Reaction; Stabilization, Factors affecting vegetation; Climatic; Eaphic, Physiographic and biotic, Effects of environments on vegetation; humidity, wind and evaporation, temperature, light, water, Relation between plants and animals: plants and plant communities and indicators; Climax formations with its classification.

Taxonomy: history of classification of plants, principles of classification and various systems, important pre-linnaean and post-linnaean system of classification: General characteristics of the following families with important genera: euphorbiaceae, ruscaceae, umbelliferae, linaeace, convolvulaceae, labiatae, capparidaceae, compositae, leguminosae, papaveracea, scrophulariaeae, gramineae, palmae, cyperaceae.

Organic evolution: theories pertaining to evolution, evidences of evolution, methods of evolution, factors of evolution.

Practicals

Plant Physiology: Experiments for the demonstration of diffusion; Osmosis, osmotic pressure, imbibition, plasmolysis, transcription, photosynthesis, respiration—aerobic and an aerobic, Plant Ecology: class excursions will be made to study the ecological factors and vegetation of various types of areas. Taxonomy: study of the general morphological characteristics of the families given in the course of theory with
special reference to the crop plants and others easily available in
the locality.

Zool. 2 - Zoology

General survey of animal kingdom: Arthropoda: characters of the
phylum and characters of the classes Crustacea, Myriapoda, Arachnida
and Insecta with emphasis on insect orders. Mollusca: characters of
the phylum and characters of the classes Lamellibranchiata or Bivalvia,
Gastropoda. Echnodermata: characters of the phylum and classes
Asteroidea, Ophioidea, Holothuroidea and Crinoidea. Characters of
the phylum Chordata and characters of the classes Pisces, Reptilia,
Aves and Mammalia; General survey of various orders under each class.
Organic Evolution: hermaphroditism, parthenogenesis, and gorm-plasm
theory, Division of labor, saprophytism, parasitism commensalism, warm-
blooded and cold-blood animals; Variation and heredity with special
reference to meristic, substantive, continuous, discontinuous and
somatogenic and blastogenetic variations; Mendel's laws of segregation
and independent assortment including Galton's laws of inheritance and
filial regression. Evidences and theories of evolution, modern con-
cepts of evolution. Rabbit (Grycolagus cuniculus) as representative
animal; habitats, external features, locomotion and relative position
of internal organs; General accounts of skeletal, digestive, circulatory,
endocrine, respiratory, excretory, nervous (including sense organs) and
reproductive system; Fertilization and development.

Practicals

Dissection of rabbit so as to expose the details of digestive,
circulatory, excretory and reproductive system; Identification of var-
ious bones; Identification of the various representative members of
the phylum arthropoda, Mollusca, Echnodermata, and Chordata, viz.,
crayfish, crab, hermit-crab, prawn, barnacle, cyclops, daphnia,
millipede, scolopendra, scorpion, spider, tick, representatives of
insect orders, fresh-water mussel, sea-mussel, snail, slug, cuttle-fish,
squid, starfish, brittle-star, sea-cucumber, common freshwater and sea
fishes, snakes, lizards, pigeon and mammals.

Chem. 2 - Organic and Biochemistry

General Chemistry: definition and scope of organic chemistry;
Methods of purification and criteria of purity; Nature of bonding in
carbon compounds, structural and graphic formulae, electronic formulae
of simple organic compounds; Estimation of carbon and hydrogen, halogen,
sulphur and phosphorus, determination of molecular weight by greezing
point and boiling point methods; Estimation of nitrogen by Kjekdahl's
method.
Aliphatic compounds: saturated and unsaturated hydrocarbons: study of paraffins, olefins, acetylenes and their halogen derivatives, petroleum; industry; Alcohols; Monohydric, dihydric and trihydric; Ethers; Aldehydes and ketones; acids; Monobasic and their derivatives, halogen substitutes, hydroxy and amino acids; Dibasic acids; oxalic acid (name only of S Succinicol acid), tartaric acid and citric acid. Elementary study of amines; Nitroparaffins and alkyl nitrates; Elementary study of oils, waxes and coaps; Elementary study of carbohydrates; Study of urea; Optical activity.

Aromatic compounds: fractional distillation of coal tar and isolation of useful compounds from the fractions; Aromatic hydrocarbons: study of benzene and toluene, structure of benzene, isomerism and orientation of benzene derivatives; Halogen derivative of benzene and toluene; Nitration: nitroderivatives of benzene and toluene; Amino derivatives of benzene, acetonilids; Diazotization: diazocompounds of benzene; Sulphonation; benzene sulphonic acid, sulphanilic acid; Phenols: phenol and picric acid; Aromatic alcohols, aldehydes and ketones; Aromatic carboxylic acid; Brief study of naphthalene and anthracene; Heterocyclic compounds, pyrrole and pyridine.

Biochemistry: chemistry of carbohydrates, lipids, amino acids and proteins, their synthesis, digestion and assimilation; Introduction of the terms enzymes, vitamins and hormones; Role of minerals in plant and animal nutrition; Chemical changes which take place during germination of seed, storage of butter and cheese, and during the processes of silage making.

General and Organic: qualitative and quantitative analysis: qualitative analysis of single salt (both acid and basic radicals) included in Chemistry-1 and the following radicals; Bismuth, cadmium, arsenic, cobalt, nickel and strontium; Determination of percentage composition in a mixture (one soluble and other insoluble in water; one volatile and other non-volatile).

Organic and Biochemistry: detection of elements: nitrogen, halogens, sulphur and phosphorus in organic compounds; Identification of the following functional groups in organic compounds; Alcoholic, phenolic, aldehydic, carboxylic, nitro, amino and amido; Preparation of Iodoform, oxalic acids; Ethyl bromide, Acetaldehyde, nitrobenzene; Identification of glucose, lactose and maltose by the osazone method; Determination of: sugars by titration methods, lactose in milk by titration method, specific rotation of sugar solution; Colour reactions of Proteins; Determination of nitrogen by Kjeldagl's method; Determination of acid, saponification and iodine values of oils and fats.

Phy 2 - Physics and Meterology

Mechanics: friction, couple simple properties, circular motion, linear simple harmonic motion and its characteristics, Young's Modulus,
Bulk Modulus of a perfect gas; Sound: wave motion, nature of sound waves in air, reflection of sound waves and formation of stationary waves, theories of resonance tube and sonometer; Electrostatics: e.s. charge, potential and intensity of field, capacity, parallel plate condenser, condensers in series and in parallel, energy of a charged condenser; Electrodynamics: Ohm's Law for complete circuit, tangent galvanometer, D.C. measuring instruments, Wheatstone's bridge and potentiometer, heating effect of current, coefficient of self induction, altering current and its simple properties, Diode, its characteristics curve; Magnetism: fundamentals, Magnetic moment, deflection Magnetometer; Heat: electrical thermometry, Newton's Law of cooling, the three coefficients of expansion and their mutual relation, expansion of gases.

Light: reflection from spherical mirrors, refraction through prism and lenses, refractive index and its determination, total internal reflection and critical angle; Meteorology; special characteristics of Meteorological instruments for observing atmospheric pressure, temperature, humidity, precipitation and evaporation, wind velocity and direction, techniques of observing the meteorological elements.

Practicals

The following is the list of experiments in Physics and Meteorology. The minimum number of experiments, to be done by the students before they are eligible for the final examination in the subject, is 20.

Mechanical properties of matter: use of precision instruments, 'g' by simple pendulum and free fall method, Young's Modulus by stretching, determination of coefficient of friction, verification of Boyle's Law, density by Hare's apparatus; Heat energy: coefficient of linear expansion of a metal rod or tube, specific heat of solids and liquids by the method of mixtures using Regnault's apparatus, and that of liquids by the method of cooling; Magnetism: experiments with deflection magnetometer; Current Electricity: verification of Ohm's Law by voltmeter and ammeter, and hence finding the unknown resistance, experiments with meter bridge and potentiometer 'J' electrically; Acoustics: experiments with sonometer and resonance tube; Light: 'f' and 'r' of spherical mirrors and lenses, by spectrometer, traveling microscope and concave mirror; Meteorology: dew point and relative humidity by wet and dry bulb thermometers, and its verification by psychrometer, reading Fortin's Barometer and applying corrections for temperature, expansion of scale, latitude of Lyallpur and its heights above sea level, to read Anemometer and to find the wind velocity.
Agr 102 - Principles of Crop Management  

Development of cropping patterns and crop rotations for different ecological zones; Relationship of crop management on national and international agriculture.

Mixed and inter-cropping, intensive and extensive use of crops, specialized, diversified and semidiversified systems. Marginal lands and cropping patterns; Economic factors involved in crop management; Cash crops; soil building and soil conservation, cropping systems, Economical use of farm labor and equipment.

Practical

Preparation of three different cropping plans for a square of land showing cash crops, soil building and intensive system. Field observation of crop management practice in the local area. Model farm practices. Preparation of cropping plan for assumed debt retirement, equipment purchase and soil building. Estimation of yields and net returns.

Hort 2 - Vegetable Production  

Importance of vegetables; Classification of vegetables; Types of vegetable growing; Climate as a factor in vegetable growing; Ideal soils for various vegetables, soil preparation; Sowing of seeds, raising nursery seedlings and their transplanting; Manures and fertilizers; Irrigation; Cultivation, mulches and weed control; Control of diseases and pests; Factors limiting vegetable cultivation in West Pakistan.

Practicals

Identification of important vegetables and their seeds; Sowing of different vegetables; Weeding and hoeing operations.
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