SOME IMPORTANT CAUSES OF FAILURES IN THE FACULTY OF SCIENCE (INTERMEDIATE) EXAMINATIONS OF THE BOARD OF SECONDARY EDUCATION, LAHORE

A THESIS

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MUSARRAT ALI KHAN

The American University of Beirut
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F.Sc. EXAMINATION FAILURES:

KHAN

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ABSTRACT

Every year nearly two thirds of the students who appear in the F.Sc. Examination fail to pass it. They often repeat the entire set of courses for one or more additional years. This results not only in financial strain on the parents but also in much wasted time, which clearly results, in the last analysis, in a national loss of time, energy and money. Efforts are made in this study to discover the causes of the excessive number of failures in the F.Sc. Examination.

The methods of present investigation mainly consist of critical analysis of data available from various sources. The available literature is analyzed to shed light on various methods of teaching and various examination systems. Questionnaires sent to Pakistani professors and students in F.Sc. programs are also analyzed critically.

The study points out the following:

1. The change in the language as the medium of instruction, which now occurs between the Matriculation and Intermediate levels, contributes a great deal to the failures of students in the Intermediate Examination.

2. The prevailing method of teaching is essentially the conventional lecture method. This, together with other traditional methods fails to develop interest among the students, promotes inactivity on their part, curtails their habits of reading and fails to encourage the spirit of knowing and discovering. Students do not get training in independent thinking, and do not form good study habits.

3. The essay-type examination conducted by the Board of Secondary Education, Lahore has strong points as well as week points. It appears that the paper-setters do not observe all of the rules and prefer "bookish" questions which require verbatim reproduction of the text. This encourages cram work, and a tendency to prepare only a limited number of "important" and "expected" questions. Studying only during the time just preceding the examination, cramming on only a small portion of the syllabus and depending heavily on "expected" questions are habits which have become fixed among the students.

4. A significant majority of lecturers believe that the present curriculum needs improvement.

5. A significant majority of students have reported that lack of regular home work assignments is responsible for many of the difficulties faced by them. This promotes carelessness and irregular study habits.

6. Students rarely read outside their text books.

Recommendations are offered for adopting Urdu as the medium of instruction at the Intermediate level, and tentative solutions to consequent changes are also suggested. Recommendations are made for the improvement of the prevailing teaching methods and the existing system of examination. Outside reading assignments, class reports and discussions in the class are recommended to help students to form good study habits and to develop independent thinking. It is also recommended that 25 per cent of the marks in each subject should be reserved for the candidates' achievement over his two-year stay in the college, independent of the final examination. It is recommended that choices in the question papers be decreased

gradually, that portions having no utility value be omitted, and that emphasis be given to modern aspects of the subjects and their practical applications.

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CHAPTER I

INTRODUCTION

The Problem And Its Importance

The Board of Secondary Education, Lahore, established in 1954, took over the functions of conducting the Matriculation, Intermediate and Languages Examinations from the Panjab University, Lahore.[1] The students from affiliated colleges and certain categories of private students are allowed to sit for these examinations.[2]

After matriculation, those who want and can afford to continue their studies, get admissions in the first year class of a college, to study agriculture, arts, languages or sciences, etc. This is an important stage in which students are prepared for their chosen careers. They are supposed to be introduced to higher education and trained in the independent pursuit of knowledge. Their achievement at this level determines to a great extent the direction of their future pursuits.

These students include candidates who want to become doctors or engineers, and select "Pre-medical Group" or "Pre-engineering Group"

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[1] Detailed responsibilities are given on pp.12-14 of the thesis.

[2] For details, see pp.63-64 of the thesis. The examinations are given to candidates from an area as much as 800 miles in radius but not all colleges in this area are affiliated with this Board.

respectively.[3] They appear in the Faculty of Science (Intermediate) Examination (usually written as F.Sc. Examination) two years after admission, and, if successful, are granted a certificate to this effect. The examination results indicate that every year nearly two-thirds of the students who appear in the F.Sc. examination fail to pass it. Table I gives the pass percentages of successful candidates in the F.Sc. examination from 1945 to 1959. The students who fail either drop out entirely or appear in the next examination. This results not only in a colossal waste of time, energy and money, but it also creates many problems of adjustment. Efforts are being made to minimize this great national loss, but with only limited success so far. This is a crucial problem facing educationists.

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[3] For details see pp.30-32 of the thesis.

TABLE I

SHOWING THE PASS PERCENTAGES OF F.Sc. EXAMINATIONS

DURING THE YEARS FROM 1945 TO 1959[4]

Year	Pass percentage in non-medical or pre-engineering group	Pass percentage in medical or pre-medical group
1945	60.6	57.3
1946	53.5	47.7
1947	49.0	46.5
1948	36.6	39.8
1949	34.5	42.3
1950	33.0	39.1
1951	36.8	30.0
1952	35.8	38.7
1953	30.2	33.7
1954	37.1	34.4
1955	31.2	31.4
1956	21.9	22.7
1957	38.2	37.5
1958	37.3	39.0
1959	37.3	40.2

[4]Figures are taken from the statement sent by the Board of Secondary Education, Lahore, on request and from Muhammad Afzal Hussain, Higher Education Examined, (Lahore, 1956), pp. 3-4.

The present study aims to discover some of the causes of failure in the F.Sc. Examination and to discover the prevailing conditions in the teaching methods and in the examination system. This is an attempt to make a contribution towards minimizing the high rate of failure, and to suggest practical modifications for the improvement of education at the F.Sc. level.

Method of Study

The method of the present investigation consists of a critical analysis of data available from the following sources:

1. The Board of Secondary Education, Lahore;
2. The Acting Chairman, Department of Education, American University of Beirut;
3. Library research;
4. Questionnaires sent to Pakistani professors and students;[5]
5. The writer's experience of 6 years as a lecturer in Mathematics.

One hundred and twenty five questionnaires for professors were sent to 25 different colleges[6] selected at random from all the 30 colleges affiliated with the Board for F.Sc. Examination in 1957. Five questionnaires were sent to each college, one for each subject viz., English, Physics, Chemistry, Biology and Mathematics. Forty lecturers from 10 different colleges[7] returned the questionnaires. Out of these, 14 were from women's colleges and 26 from men's colleges. The purpose of the questionnaire

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[5] Questionnaires are given in Appendix C.

[6] The names of the colleges are given in Appendix A.

[7] The names of the colleges are given in Appendix B.

was to investigate the present methods of teaching, the amount of interest among the students, the difficulties faced by students, opinions about the text books, curriculum, and types of examination, and other probable causes of the many failures.

One hundred and seventy-five questionnaires were sent to students who failed in the F.Sc. examination, and rejoined the second year class in the above 25 colleges, while 25 questionnaires, (one for each college) were meant for those who passed in F.Sc. examination and were admitted to the third year class. Efforts were made to make this sample a reasonably random one: the principals were asked to give these questionnaires to students who were admitted first, or, if many were already present, to give them to the first names on an alphabetical list. Nine questionnaires from successful candidates and 60 questionnaires from unsuccessful candidates were returned, representing 11 colleges.[8]

The purpose of the questionnaire to students was to know their methods of study, personal difficulties faced during their stay in the F.Sc. course, and other information related to the problem under consideration.

It should be pointed out here that only 32 per cent of the lecturers and 34 per cent of the students responded to the questionnaires. These respondents, who have clearly shown a cooperative spirit, are almost certainly not entirely representative of the samples selected for study. But since the information requested does not call for favourable or unfavourable remarks about the respondent or any person related to him, this small percentage of response may be considered as

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[8]The details are given on pp.112-113 of the thesis.

reasonably representative of the intended samples.

Statistical methods are used for calculating means and standard deviations.[9] The significance of various results is also tested, with the help of the two-tail binomial test,[10] the Chi-square test[11] and methods of testing the reliability of a difference between means.[12]

Delimitations

The study is restricted to the Intermediate Examination of the Faculty of Science, Board of Secondary Education, Lahore, and aims only to cover those F.Sc. students in the Pre-engineering and Pre-medical Groups, and the corresponding lecturers in the colleges affiliated with the Board, in West Pakistan.

Definitions of Terms

1. Board is used for the "Board of Secondary Education, Lahore".

2. F.Sc. or F.Sc. Class means first year and second year classes of the college, during which students are prepared for the Intermediate Examination of the Faculty of Science, Board of Secondary Education, Lahore.

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[9] See for example, Helen M. Walker, Elementary Statistical Methods, (New York, 1955).

[10] See J.P. Guilford, Fundamental Statistics in Psychology and Education, (New York, 1956), pp.207-209.

[11] See E.F. Lindquist, Statistical Analysis in Educational Research, (Boston, 1940), pp.30-46.

[12] J.P. Guilford, Fundamental Statistics in Psychology and Education, (New York, 1956), pp.183-184.

3. Professor and Lecturer both mean one who delivers lectures in the recognized colleges. The words are used interchangeably in this study.

4. The result is significant at the .01 level means that chance sampling factors cannot be expected to produce this result except in one out of 100 similar measurements. Similarly, the result is significant at the .05 level means that this result can be produced by chance only 5 times out of 100.

5. Pakistani students, Pakistani lecturers, methods in Pakistan, etc. should be interpreted as "students and lecturers belonging to the colleges affiliated to the Board of Secondary Education, Lahore","methods prevalent in these colleges", etc.

CHAPTER II

THE MEDIUM OF INSTRUCTION AS A CAUSE OF FAILURES

Historical Background Leading to the Existing Change in Language as the Medium of Instruction

The University of the Panjab was established in 1882. It is mainly an examining body, but has two additional functions:

1. It is directly responsible for education at the post-graduate level in the department of Arts and Sciences. It has its own teaching staff, laboratories and other facilities for post-graduate education and research.

2. It also directly controls and manages a Law College, an Oriental College[1] and a Commerce College.

The Law College offers a programme up to the Bachelor's degree, and other institutions provide facilities leading to post-graduate degrees.

The main function of the University of the Panjab, however, is to conduct examinations and to award diplomas, certificates and degrees to successful candidates. Before 1955, the examinations conducted by the University were as follows:

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[1] An Oriental College prepares students up to the Master's degree in classical and Pakistani Languages, such as Arabic, Persian and Urdu.

Matriculation (After 10th year of education)

Intermediate

a. Faculty of Arts (F.A.)

b. Faculty of Sciences

(i) Medical or Pre-medical group (F.Sc.)

(ii) Non-medical or Pre-engineering group (F.Sc.)

Bachelor's Degree (After 14th year of education)

a. Arts (B.A.)

b. Science (B.Sc.)

Master's Degree (After 16th year of education)

a. Arts (M.A.)

b. Science (M.Sc.)

Professional Degrees

Master's Degree in Agriculture (M.Sc. Agri.)	(4 examinations, at the end of 12th, 13th, 14th and 16th years of education)
Master's Degree in Commerce (M. Com.)	(4 examinations, at the end of 13th, 14th, 15th and 16th years of education)
Bachelor's Degree in Engineering (B.Sc. (Eng.))	(3 examinations, at the end of 13th, 14th and 15th years of education)
Bachelor's Degree in Law (LL.B.)	(2 examinations, at the end of 15th and 16th years of education)
Bachelor's Degree in Medicine and Surgery (M.B.B.S.)	(4 examinations, at the end of 14th, 15th, 16th and 17 years of education)
Bachelor's Degree in Teaching (B.T.)	(After 15th year of education)
Master's Degree in Veterinary Science (M.V.Sc.)	(4 examinations, at the end of 12th, 13th, 14th and 16th years of education).

In addition to this, the University also provides facilities for research leading to Doctoral Degrees in many fields.

All the Colleges affiliated with the University of the Panjab are bound to abide by its rules and regulations concerning qualifications of candidates and qualifications, pay and work loads of lecturers, the requirements for buildings and laboratories, etc.

From the very beginning of the British rule,[2] efforts were made in India, to use the vernacular languages as the medium of instruction for all examinations and for all subjects, including sciences, law and medicine. According to Bhagwan Dayal "All these efforts to educate the Indians through the medium of the vernacular deserve great praise. But they were all isolated efforts, too weak to check the flood of English education in India."[3] He further pointed out that "in 1845 the controversy between the Anglicists[4] and Vernacularists[5] became acute."[6] But as a result of the British rule in India, better prospects were open for graduates who knew English, and consequently the English language gained popularity. The better service opportunities for graduates knowing English compelled the authorities gradually to accept English as a medium of instruction and examination at all levels. Bhagwan Dayal in his criticism writes, "In short, the period under review[7] was a period of great controversies

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[2]The last quarter of the 18th century and first three decades of the 19th century.

[3]Bhagwan Dayal, The Development of Modern Indian Education, (Bombay, 1955), p.70.

[4]Those who were in favour of English Language.

[5]Those who were in favour of the vernaculars.

[6]Ibid., p.77.

[7]The period from 1833 to 1850.

when several educational forces were pulling in different directions instead of working harmoniously together for the good of the country. It was most unfortunate that the Anglicist force, with the weight of the Government thrown on its side, pushed the entire educational current into a wrong channel from which we have not yet been able to extricate it even after a hundred years of constant effort."[8] In spite of this fact, there were still those in favour of vernacular languages as the medium of instruction at the Matriculation stage. Their efforts resulted in no more than the choice being given to students to give their answers to the General Knowledge[9] (History and Geography) part of the examination in one of the vernaculars. The questions in General Knowledge however, continued to be printed in the English language only.

As late as 1937, in their report entitled "Vocational Education in India with a section on General Education and Administration", Messrs. A. Abbott and S.H. Wood, nominees of the Board of Education in England, recommended that "the vernacular languages should, as far as possible, be the medium of instruction throughout the high (or higher secondary) schools, but English should be a compulsory language for all pupils in these schools".[10]

The struggle for independence and the increasing hatred against the Britishers made the people very nationalistic in every sphere of life. People began to assign an importance to the development of their

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[8] Ibid., p.227.

[9] General Knowledge is one of the five subjects required for the Matriculation examination. It consists of two papers evaluated at 3/17ths of the weight of the total examination.

[10] As quoted in Bhagwan Dayal, The Development of Modern Indian Education, (Bombay, 1955), p.277.

own national language. After the establishment of Pakistan in 1947, popular sentiment in favour of replacing English by Urdu increased. People considered the use of the English language to be an agent which could effectively bring about a degeneration of their culture and values. In their opinion, the introduction of this language had already caused a deterioration in the Indian culture and produced many problems of adjustment among young and old. In 1950, in response to this national enthusiasm, Urdu was declared an alternate language for all subjects in the Matriculation examinations and for arts subjects only in the Intermediate examinations. The choice was, however, given to teachers and lecturers to use either English or Urdu as the medium of instruction. Students in these examinations could elect to express themselves in either English or Urdu.

By virtue of the authority conferred by section 88 of the Government of India Act, 1935, the Governor of the Punjab issued The Panjab University Act (Amendment) Ordinance, 1954, (Punjab Ordinance No. VII of 1954), which removed from the University of the Panjab the power to conduct the Matriculation, Intermediate and Pakistan & Classical Languages examinations, and handed over these functions to a Board established by Governor's Ordinance, The Punjab Secondary Education Act, 1954 (Punjab Act VIII of 1955), which was amended by

1. The West Pakistan (Adaptation of laws) Ordinance 1956. (Ordinance III of 1956)

2. The Punjab Secondary Education (West Pakistan Amendment) Act, 1958 (West Pakistan Act No. XXI of 1958)

3. The Punjab Secondary Education (West Pakistan Second Amendment) Act, 1958 (West Pakistan Act No. XXII of 1958).

The Board consists of one chairman and 51 members and is empowered "to organize, regulate, develop and control secondary education within its jurisdiction".[11] In particular the Board has the power:

(i) to hold and conduct all examinations pertaining to Secondary Education including the Matriculation, Intermediate and Pakistan & Classical Languages Examinations and such other examinations as may be determined by Government;

(ii) to prescribe courses of instruction for its examinations;

(iii) to lay down conditions for the recognition of classes for the purpose of the Matriculation examination and to call for inspection reports from the West Pakistan Education Department in this behalf;

(iv) to recognize Higher Secondary Institutions, Intermediate Colleges or Intermediate Classes in the Colleges or to withdraw such recognition;

(v) to inspect and call for Inspection Reports on the condition of the Higher Secondary Institutions or Intermediate Colleges or Intermediate Classes in the colleges, if such institutions, colleges or classes are recognized by the Board or if an application thereof is pending with the Board;

(vi) to inspect and recognize institutions preparing candidates for the Pakistan & Classical Languages Examinations or to withdraw such recognition;

(vii) to admit candidates to its examinations;

(viii) to grant certificates and diplomas to persons who have passed its examinations;

(ix) to withdraw diplomas and certificates;

(x) to demand and receive such fees as may be prescribed;

(xi) to supervise the residence, health and discipline of the students of its recognized Institutions and Classes and to make arrangements for promoting their general welfare;

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[11] Board of Secondary Education, The Calendar 1959-61, (Lahore, 1959), p.6.

(xii) to hold and manage endowments and to institute and award scholarships, medals and prizes in accordance with the Regulations;

(xiii) to organize and assist extra-mural activities in and for its recognized Institutions and Classes;

(xiv) to appoint such officers and servants as the Board may deem necessary to carry out the purposes of this Act; and

(xv) to do all other acts necessary for carrying out the purpose of this Act.[12]

The Board instituted no radical changes, but continued to hold examinations without appreciable modifications. Urdu continued to enjoy the status of an alternate language as the medium of instruction and examination for the Matriculation examinations and arts subjects in the Intermediate examinations. The University of the Panjab continued to perform the functions which had not been taken over by the Board.

Effects of the Sudden Change of Language for the Medium of Instruction in the F.Sc. Examination

Under the present circumstances, well over 95 percent of the students accept Urdu as the medium of expression in the examination at the Matriculation stage, as is evident from the following figures:

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[12] Ibid., pp.6-7.

TABLE II

NUMBER OF CANDIDATES OFFERING URDU AND ENGLISH AS THE MEDIUM OF EXPRESSION IN THE MATRICULATION EXAMINATIONS DURING THE YEARS 1955-59

Year	Total Number of Candidates	Number Offering Urdu	Number Offering English
1955	50,046	49,474	572
1956	56,111	55,473	638
1957	57,818	57,150	668
1958	55,515	54,853	662
1959	62,249	61,411	838

When these Urdu-educated and Urdu-preferring students go on to college for admission to the F.Sc. class, they have no alternative but to accept English as the medium of instruction for all the science subjects. (Generally about one third of them gain admission to the F.Sc. class, while two thirds are admitted to the F.A. class.) They are not familiar with scientific terms in English and their ears and minds are not accustomed to the job of extracting meanings from lectures in a foreign language.[13] They want everything explained in their mother-tongue. The

[13] At this stage a science student may have had as little as 5 years of instruction in the English language, ---- instruction, which according to Head Examiner's report is characterized by "cram work e.g. learning the meaning of important idioms, synonyms, antonyms and typical sentences for correction or translation etc." (Taken from Head Examiner's reports 1956-58).

lecturers too, find it difficult to apply the principle of connecting new matter with what their students already know, because scientific subjects involve technical terms and expressions, and to familiarize the students with these terms in English forces them to repeat most of the subject matter the students learned previously in Urdu. This situation is somewhat reminiscent of the results of the study made by Wetzel,[14] in his Master's thesis, "Deficiencies of Elementary Chemistry Students in College and University" at the University of Colorado, in 1938. Wetzel concluded that almost 66 percent of the professors in the colleges preferred students who had not studied chemistry at school. "They either preferred to start from scratch in the subject or felt that the high schools had generally done so bad a job of instruction that more harm than good had come of it".[15]

The situation becomes worse when the lecturer himself does not know the Urdu equivalent of an English scientific term. He is not entirely to blame for this. First, he himself was educated in English, secondly he has been teaching in English for a number of years, and thirdly he cannot find standardized translations of scientific terms because different authors use entirely different Urdu words for the same English one. The situation can well be imagined when a professor says "Apply componendo-dividendo and get the result" and his students, of course familiar with the process but unfamiliar with this term, look at him with empty faces. The professor, who is intelligent enough to

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[14] As mentioned by R. Will Burnett, Teaching Science in the Secondary Schools, (New York, 1957), p.91.

[15] Ibid., p.91.

guess the situation from their faces, finds himself helpless, as he does not know the Urdu equivalent of componendo-dividendo.

Entirely apart from the matter of understanding English, the need of the students to express themselves in English is another difficult hurdle. Students, up to Matriculation, do not in any practical sense have a command of the English language, and they have had no experience in expressing themselves in English, but only about English, in the English language classes, such as they are. Their English is thus too poor to enable them to express their ideas. Although the Board issues instructions to paper setters[16] that "in Question Papers on Languages, direct questions involving work of memory rather than of intelligence, should be discouraged,"[17] this suggestion is not often followed in practice. It is agreed that most of the students depend on memory work, preparing themselves through guess work about probable examination questions and "guess papers", commonly available in the market before the examination. Poor comprehension and poor expression in English retard their progress considerably.

Those who are able to pass the Intermediate examination and continue further study in a Medical college, an Engineering college or an Arts college, find themselves quite at home. The medium of instruction and examination at the higher levels is English, and the successful intermediate student is part of a group which has gone through extensive selection in which the command of English played a dominant role. In

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[16] i.e., those who construct examination questions.

[17] Board of Secondary Education, The Calendar, 1959-61, (Lahore, 1959), p.123.

this sense study at the Intermediate level is a kind of preparation for success in higher studies in Medicine, Engineering and other science branches.

Status of the English Language

No satisfactory solution for the problem raised by the two media of instruction has so far been accepted by the educationists. It is still an undecided and open question. The government of Pakistan was perhaps aware of the difficulties of the change-over, when it decided about the status of English language in official work. In the face of national enthusiasm, it was a bold step on the part of the government to decide to make a slow rather than a rapid switch-over to national languages (Urdu and Bengali). During 20 years (ending most probably in 1974) English will continue to be considered as the official language. It is feared that it may take more than 20 years to replace the English language completely; progress in this direction has been slow.

Arguments for Replacing English Entirely by Urdu

There are people who claim that English should be replaced by Urdu in all fields immediately -- the schools, the colleges, the parliament house and the offices. Some of the advocates of this belief have set up a college at Karachi, in which they claim to impart all education in Urdu up to the B.A. degree. They advance Noah Webster's arguments in support of nationalizing their education. Webster said, "Our national honor requires us to have a system of our own, in language as well as government. . . . Besides this, a national language is a band of national

union".[18]

Although enthusiasm for this cause sometimes appears to get the better of reason, some of the arguments advanced are worth noting.

First, it is claimed that the imposition of the English language is a symbol of slavery. The sooner it is got rid of, the better. According to this opinion, Britishers introduced this language only to contaminate Indian culture with English culture so as to produce disruption in it. Britishers' designs came out in the words of Macaulay, the then President of the General Committee of Public Instruction in India, when he said in 1835 that the purpose of education in India was to create "a class of persons Indian in blood and colour but English in taste, in opinions, in morals and in intellect."[19] The people in favour of Urdu want to give more emphasis to the development of the national language. The best and most speedy way, in their opinion, is to change the medium of instruction immediately. They also find great truth in the words of Karl Vossler, who says:

> So there is in fact a national, linguistic sense of honour or at any rate there should and must be one, since and as long as there are national wars about languages and attempts at throttling them. If a man is robbed of his earthly home, he finds a spiritual home in his mother-tongue, which is everywhere and always present to his senses, and can therefore at some time again become concrete and have an earthly home. . . . The man who denies or gives up his last refuge and sally-port of his home sentiments, is without honour; he is dead to the community in which he received his first experience of human language.[20]

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[18] As quoted by John S. Brubacher, A History of the Problems of Education, (New York, 1947), p.56.

[19] As quoted by Bhagwan Dayal, The Development of Modern Indian Education, (Bombay, 1955), p.203.

[20] Karl Vossler, The Modern Language Journal, XLII-2, (Feb., 1958), p.90.

Secondly, it is held that the widespread use of a foreign language is a great hindrance to progress and prosperity. One cannot express one's ideas and sentiments freely in a language which is not his mother-tongue. It is asked, "When every free nation has its own mother tongue as the official language, why should we not adopt Urdu as our national and official language?"

Thirdly, it is argued that the time and energy spent for learning English is wasted. Those who hold this view say that English may help those who want to do research or to represent the country at the international level, but for everyday affairs it is only wasteful to give it so much importance. They believe that most students fail either because they fail in English or because they have to devote too much time to English at the cost of other subjects.[21] The following figures provide a comparison of the pass percentages in the subject of English alone and the over-all pass percentages in the Intermediate examinations during the years 1949-1958:

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[21]Failing in English alone means failure in the examination.

TABLE III

PASS PERCENTAGE IN THE SUBJECT OF ENGLISH AND THE INTERMEDIATE EXAMINATIONS

Year	Pass percentage in the subject of English	Pass percentage in the Intermediate Examination
1949	48.9	41.1
1950	46.3	39.3
1951	52.0	36.5
1952	51.4	34.0
1953	50.2	36.2
1954	51.1	35.2
1955	44.0	32.6
1956	33.2	25.0
1957	48.2	36.9
1958	44.4	32.4

Arguments for Maintaining English as the Medium of Instruction

There is another group of people who firmly support the English language as the medium of instruction. The reasons which they give to support their point of view usually imply the continuance of the English language as a vital force in Pakistan for an indefinite period. They consider English to be unavoidable. In their opinion, the State is likely to collapse if English is thrown out. English is the most widely spoken and written language in the world. Most recent research is

available in this language. Without English, people will be completely cut off from the outside world. The world is moving with tremendous speed, and if the people of Pakistan aspire to join this race of progress at all, it is fundamentally important that they should have a perfect command of the English language. In fact, they say, English alone is not enough; at least one more foreign language is essential to participate in the benefits of scientific research. They would agree with John Lear, who gave advice to his American countrymen in the following words:

> It would save us the trauma of future shock if we would simply abandon the notion of catching up in the conventional sense, plan our own research on a long range footing to fit the needs and aspirations of democracy regardless of what Moscow does or talks about, reverse our haughty practice of looking down our noses at forms of government different from our own, learn to read foreign language research reports with the same facility that foreigners today read research reports in English, and mesh that language study with modern technology and social sciences and diplomacy to restore democracy to its former place of honor.[22]

Another argument which is advanced in favour of retaining English is the linguistic division of Pakistan. Geographically, Pakistan has two parts -- East Pakistan and West Pakistan -- separated by nearly 1,100 miles of Indian territory. Urdu is popularly understood and read throughout West Pakistan, and very few West Pakistanis know the Bengali language. The Bengali language is spoken and written throughout East Pakistan, and few persons there can understand Urdu. Under these circumstances, English is the only language tie between the two wings of Pakistan, and it is therefore much easier to adopt English as a single official language rather than to consider both Urdu and Bengali

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[22]John Lear, The Modern Language Journal, XLII-2, (Feb., 1958), p.104.

as official languages. The immediate switch-over from English to Urdu or Bengali, it is argued, may result in complete dislocation and may create a gulf between the two parts of Pakistan.

Arguments for a Compromise Position

There are still other people who are neither so impatient as to claim the immediate abolition of English from the country nor so complacent as to favour the idea of accepting English as the medium of instruction for an indefinite period. They differ among themselves greatly on several points such as the period of transition, the method of switch-over, etc. They neither undervalue the importance of a national language nor consider English as irreplaceable. They agree that it is difficult to have full understanding of subject matter which is in a foreign language. At the same time, they feel that it would be a great risk to drop English precipitously, as this might plunge the State into serious difficulties. It is really difficult to imagine the magnitude of the repercussions of such a great change in the social, economic and educational patterns of the existing culture.

Comparison of Urdu and English as the Medium of Instruction

If Urdu were to be accepted suddenly as the medium of instruction at all levels, the first problem would be the lack of books in Urdu. It would be clearly impossible to translate the thousands of books and journals printed all over the world every year. Even the best selection would not cover more than a few per cent. With the help of Nizam, the ruler of Hyderabad State (India), the Osmania University, Hyderabad Daccan, tried this experiment. A Bureau of Translations was created

in 1918 to translate important books in all the fields, including medicine and sciences.[23] In spite of several years' efforts they were not able to translate more than about one thousand books. Even these books, translated into Urdu, were not very useful to the students. Most of the work consisted of purely literal translation, and was thus very difficult and often impossible to understand. It had been decided to use Arabic and Persian words for the scientific terms, and these were not familiar to the students. It is believed that almost every student who knew English kept and consulted the original books in English in order to have a clear understanding.[24] This experiment clearly points out that effective translation and standardization of scientific terms are two very important additional problems which must be faced. The Urdu language is a new language; at the same time it is often impossible to find words for technical terms within the language. One has to take words from older and richer languages such as Arabic and Persian. Due to the differences in the script, it is not always easy to make English technical terms into Urdu words. And Arabic and Persian do not have standardized translations of technical terms. Moreover, a dependence on translation will not only deprive the people of the use of publications in English but will keep them several years behind, due to the time-lag in translation. This will encourage imitation, and not active participation in finding new truths. At best, the translation may often represent not the true sense, but the

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[23] Syed Nurullah & J.P. Naik, A History of Education in India, (Bombay, 1951), p.872.

[24] The writer interviewed some of the students and a professor from Osmania University in 1950 and 1953.

sense as interpreted by the translator.

Another difficulty which might be faced during the first few years of an all-Urdu curriculum is the lack of teachers who are equipped to teach their pupils in Urdu. At present, lecturers in the Intermediate colleges who are accustomed to teach in English are not especially concerned about how their subject is taught in the schools, or about which Urdu terms are being used.

In spite of all these drawbacks, the importance of the development of a national language as the medium of instruction cannot be overlooked. English has many advantages, and as a foreign language its study is also likely to aid in the better comprehension and control of the mother-tongue. A study made in the United States by R.B. Skelton[25] subjected 1647 students to a battery of six tests (Mechanics of expression, effectiveness of expression, reading comprehension, American history, mathematics, and a psychological examination combining I.Q. and linguistic ability). The students consisted of three groups:

1. Those who had studied a foreign language for more than 2 years in High Schools,

2. Those who had studied a foreign language for less than 2 years in High Schools,

3. Those who had not studied any foreign language.

The study proved a highly significant superiority in English of students who studied foreign languages over those who did not, in each of the six tests, "whether as groups or on intelligence level."[26]

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[25]Robert B. Skelton, "High School foreign language study and Freshman performance", The Modern Language Journal, XLII-1, (Jan., 1958), p.10.

[26]Ibid., p.10.

Furthermore it established that group 1 surpassed group 2 by about the same margin as group 2 surpassed group 3. Of course "planetary influences, relative humidity, broken homes, or the possibility that students who try harder on examinations naturally gravitate to the study of certain subjects"[27] were not taken into account. "Statistical analysis, reason, and the experience of generations force us to the conclusion that the study of foreign language does improve one's command of his own language, thereby enhancing one's control of subject matter in fields in which language is the vehicle of instruction."[28]

No scientific study exists at present to show that significant improvement has taken place in the standard of the subjects studied through the medium of Urdu at the Matriculation stage. The Matriculation result, which depends on so many other factors and variables, cannot be taken as testimony. However, one does not find great improvement in the pass percentage since 1950, when Urdu was first accepted as the medium of instruction. Table IV shows up-to-date statistics on pass percentages at the Matriculation Examination.

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[27] Ibid.,

[28] Ibid.

TABLE IV

RESULTS OF THE MATRICULATION EXAMINATION DURING THE YEARS 1945-59

Year	No. Appeared	No. Passed	Pass Percentage
1945	42,622	28,741	67.4
1946	49,680	30,860	62.1
1947	38,029*	25,000	65.7
1948	19,317	10,936	56.6
1949	19,513	11,726	60.0
1950	25,327	13,875	45.7
1951	28,390	15,792	55.6
1952	32,111	17,559	54.6
1953	37,144	21,691	58.3
1954	41,901	23,534	56.1
1955	48,532	23,205	47.8
1956	53,053	25,775	48.5
1957	57,818	28,613	49.5
1958	55,515	31,162	56.1
1959	62,249	37,077	59.5

*1947 was the year of independence and partition of India. Unsettled conditions and communal disturbances caused the sharp drop in numbers; this continued for some years.

While the pass percentages show no great change since 1950, the examiners agree that this change at the Matriculation stage "has definitely lowered the standard of proficiency in English."[29] The students no longer have the opportunity to practice reading books in English (other than their English language course texts) and their vocabulary in English is markedly curtailed.

The following are some quotations from the reports of the Head Examiners in English (Intermediate Examination) during the years 1956-58:[30]

> "Most of the candidates had practically no command over the language. Their answers were full of spelling mistakes and grammatical blunders."
>
> "Most of the boys and girls when they join the first year class display a deplorable lack of ability to read and write even simple English."
>
> "Grammar is very weak, especially tenses. Majority lacks expression altogether."
>
> "English in schools appears to have fallen very low."
>
> "Most of the candidates cannot write simple correct English."
>
> "The general standard of English language is very low and the power of comprehension and expression simply deplorable."

Discussions in this Chapter have shown that controversy over the language as medium of instruction is still a bone of contention between two schools of thought -- one demanding an immediate change to Urdu as the medium of instruction and another in favour of retaining English as

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[29] Muhammad Afzal Hussain, Higher Education Examined, (Lahore, 1956), p.44.

[30] Taken from typed copies of the original reports.

the medium of instruction. In addition to the nationalistic feelings for the development of the mother-tongue, the ease which students will have in comprehension and expression, and their savings in time and energy otherwise spent in mastering a foreign language, are the chief advantages claimed by those who are in favour of the immediate proclaiming of Urdu as the medium of instruction.

The importance of the English language in international affairs and in the fast-developing modern world, the shortage of books in Urdu, the difficulties in translation of technical terms from English to Urdu, and the bilingual nature of Pakistan are the factors considered most important by those who want to retain English as the medium of instruction.

At present, all the subjects including the sciences are taught in Urdu up to the Matriculation level, while only science subjects are taught in English in the Intermediate classes (the following two years). The students, who are not familiar with scientific terms in Urdu, fail, in the Intermediate, to grasp the lectures and the scientific terms which are presented in English. The professors have to repeat a considerable portion of high school science in their lectures just to familiarize the students with scientific terms in English. Thus they do not find enough time to cover the syllabus for the Intermediate classes thoroughly. This leads to poor understanding and comprehension on the part of students and results in poor standards and inadequate achievement in the examination. This supports the claim that the change of medium of instruction which now occurs between the Matriculation and Intermediate levels contributes a great deal to the failure of students in the Intermediate Examinations.

CHAPTER III

CURRICULUM AND METHODS OF TEACHING AS CAUSES OF FAILURES

Subjects and Curriculum for the F.Sc. Class

Specialization usually does not start directly after matriculation, except in the field of agriculture, commerce and veterinary science. After passing the matriculation examination, any student who so wishes can be admitted to the first year class of a college, provided he can afford to pay the college fees.[1]

At present, a student elects one of the following four groups, if he is not majoring in a technical group;[2] under each group are given the subjects in which he will be examined at the end of two years:

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[1] In different colleges, the fees are different. On the average an F.Sc. student pays nearly Rs.150/- in one academic year for all the four subjects. Usually a limited number of fee concessions and scholarships are also available for needy and deserving students. (1 American Dollar = 4.77 Pakistani Rupees.)

[2] Before 1958, there were only three groups, namely, Arts, Medical Group, and Non-medical Group. The Arts Group is now subdivided into two parts and the Medical and Non-medical Groups have been renamed the Pre-medical and Pre-engineering Groups respectively.

Technical Groups include the following Groups: Industrial Arts Group, Commerce Group, Home-Science Group (for Girls only), Nursing Group (for Girls only), Military Studies Group, and Agriculture Group.

1. Humanities Group (F.A.)	Marks
a. English (Fixed subject).	200
b. One of the following as an additional optional subject: Urdu, Arabic, Persian, Bengali, French, German and Islamic Studies.	100
c. Any three of the following subjects: History, Economics, Geography, Philosophy, Psychology, Civics, Statistics, Mathematics, Religions of the World with Special emphasis on Islam, Music, Fine Arts and one language (Arabic, Bengali, French, Greek, German, Hebrew, Hindu, Latin, Persian, Punjabi, Pashto, Sanskrit, Sindhi and Urdu). (200 Marks for each subject)	600
Total:	900

2. Languages Group (F.A.)	
a. English (Fixed subject).	200
b. One of the following as an additional optional subject: Urdu, Arabic, Persian, Bengali, French, German and Islamic Studies.	100
c. Any three of the following languages, one as major language (carrying 200 Marks) and two as subsidiary languages (carrying 100 Marks each): Urdu, Arabic, Persian, Turkish, Bengali, German, French, Russian and Spanish.	400
d. Any of the following subjects:	

	Marks
History, Economics, Geography, Philosophy, Psychology, Civics, Statistics, Mathematics, Religions of the World with special emphasis on Islam, Music, Fine Arts.	200
Total:	900

3. Science (Pre-medical) Group (F.Sc.)

a. English, Biology, Physics and Chemistry. (200 Marks for each subject).	800
b. One of the following as an additional optional subject: Urdu, Arabic, Persian, Bengali, French, German and Islamic Studies.	100
Total:	900

4. Science (Pre-engineering) Group (F.Sc.)

a. English, Mathematics, Physics, Chemistry. (200 Marks each subject).	800
b. One of the following as an additional optional subject: Urdu, Arabic, Persian, Bengali, French, German and Islamic Studies.	100
Total:	900

The "Committee of Courses" for each subject is organized by the Board, which includes seven persons, who are either teachers in that subject or experts in the field. The outlines of the courses approved by this committee are supplied to the professors who are supposed to cover all the course during the two-year session. As an example, the

syllabus for the subject of Mathematics for the Intermediate Examination to be held in 1960 is given in Appendix D.

Importance of the F.Sc. Class

The students who pass the F.A. Examination may continue their studies for the B.A. or may join a commerce college for the B.Com. Degree. Most of the students after passing the F.Sc. Examination, try to join a Medical or Engineering College, but only a limited number of places are available in these professional colleges. The others may continue their studies for the B.Sc. Examination. The Intermediate Class is a kind of preparation for the professional colleges.

Aims of Teaching in the F.Sc. Class

Apart from the general aims of education in Pakistan, there are some specific aims, which most observers would agree, are kept in view by the F.Sc. professors who prepare students for the F.Sc. Examination:[2A]

1. To prepare young persons to receive instruction at higher levels.

2. To provide the students with an adequate knowledge of the fundamental principles of the subject and to prepare them for a particular field of work which they may choose as a future career. Most of them go into the medical or engineering professions.

3. To inculcate an interest in and love for the F.Sc. subjects in the young minds.

[2A] The Calendar of the Board of Secondary Education does not contain aims of teaching in the F.Sc. class.

CONVENTIONAL AND MODERN EDUCATION

Introduction

The methods of teaching and the curriculum are generally based upon the philosophy a country wants to pursue. There are countries whose leaders believe almost exclusively in supporting traditions and promoting disciplined obedience among the people. The power in such countries is usually concentrated in a few people who think, plan and lead. Man is considered limited by nature in his power to achieve, and is to be given only a well-selected portion of the accumulated knowledge and experience of the race by the teacher. The possession of knowledge becomes the real test of one's education. The sorting out of ideas according to an individual's interests and his major field becomes the chief concern for the educationists. The student tries to learn as much as possible. Concerning this method, Leonard and Eurich say, "The breadth and depth of one's knowledge of the field is the ultimate test of his educational success."[3] The mastery of subject matter is of primary concern, the validity of which has been tested on the anvil of the experience of preceding generations. This authoritarian outlook is prevalent in every relationship -- the relation between the teacher and the taught, the principal and the teacher, the inspector and the principal etc. The knowledge is presented to students as facts of lasting value.

There are educators, however, who put more emphasis on pupils'

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[3]J. Paul Leonard, and Alvin C. Eurich, An Evaluation of Modern Education, (New York, 1942), p.7.

freedom. For them, independent thinking, initiative and self-reliance are the fundamental virtues to be inculcated in the children. "Individuality in capacity and aptitudes lays an inescapable imperative on curriculum and methods. What interests the individual is made the basis for the motivation of instruction."[4] They have complete faith in individual personality and individual freedom. A man, for them, is always reacting and responding to a rapidly changing world. Personal adjustment in such an atmosphere becomes an important problem. The tension is resolved not only with the help of knowledge, but also by the utilization and release of energy to overcome disturbances. The attention of the teacher is not on the text books but on the individual student and his needs. These are generated by the uncertainties of everyday living, and offer a continuous challenge "to learn, to apply one's intelligence to the control of precarious factors in his environment."[5]

Existing Methods in Pakistan

The prevalent methods of teaching in colleges are quite similar to the lecture method used in the English system of education. One or more text books are prescribed and the students are supposed to learn all or most of the contents. The teacher is supposed to prepare the subject thoroughly by consulting various available sources, to form his own point of view about the issues, and to tell his students what

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[4]John S. Brubacher, Modern Philosophies of Education, (New York, 1950), p.298.

[5]Ibid., p.298.

is best in his opinion. The students take notes of his lecture and try to remember them with the help of their text books. This, and nothing more, is what they are expected to reproduce in the examination. Some lecturers prepare their lectures thoroughly, get the latest ideas from outside readings, and explain as clearly as possible to the pupils. They try to keep their pupils attentive during the lecture hour by asking questions and making suggestions for improvements. Sometimes their efforts are also directed towards developing thinking abilities, but most often the students get ready-made ideas, never question the authority of professor, and seldom feel the necessity of looking into books outside the text. There are some professors who are satisfied with the exclusive use of text books. They do not consider it necessary to read other books at all. They consider it their duty to explain and clarify all that is given in the text book, even if it was written in the 19th century. The subject matter is logically organized and they usually prefer to follow the same sequence.

The science subjects are also presented as absolute facts. Efforts are made to see that the facts and basic principles given in the text are learned by the students. Standard apparatus, made by foreign or local firms, is used in all kinds of demonstrations. The students work in groups during the double period of laboratory practicals. Usually each student is supposed to complete a set of standard experiments in each subject by attending the laboratory twice a week for each science subject. His "Practical Note Book"[6] is examined by the examiner for

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[6] A note book especially meant to record the procedure, diagrams and results of different experiments. This note book is signed by the professor in charge.

practicals at the time of the final examination. The method can be summed up thus; "the teacher lectures, the pupil listens, and gives out the information at suitable intervals."[7]

Strong Points in Prevalent Practices

The sphere of knowledge is increasing very fast. It is not humanly possible for one individual to know everything, even in a single field of study. The advocates of the present system of education in Pakistan argue that to enable the students to acquire maximum knowledge in the shortest period of time, the pupils are shown the royal road discovered by their professor on the basis of his trial and error experience, so that they may not have to waste their time by checking and verifying every statement. According to them the students get full benefit from the experience of another's life. It is believed that the teacher, being an experienced and matured person, is well-read and expert in his field. His judgment and opinion about any issue has high probability of being close to truth in comparison to the judgment and opinion of a student who forms his idea merely on the basis of poor comprehension of one or two books. The student can use his teacher's judgment as a tentative solution in practical life, till his own experience modifies or improves it.

Not only does this save the students' time, but it also requires fewer teachers. One teacher can lecture to more than 100 students at a time. All the students, provided they are intellectually ready for

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[7] I.L. Kandel, Essays in Comparative Education, (New York, 1930), p.130.

the lecture, will get the benefit of the teacher's experience, wisdom and high standard of scholarship.

Weak Points in Prevalent Practices

Some of the weak points in the prevalent methods are as follows:

1. This method expects almost no activity on the parts of students. The lecturer does all the work while the students take notes and try to remember. In this way, cramming is encouraged. The student is not trained to take initiative, to think and to use his judgment, because he always suffers from an inferiority complex before his teacher. For him, a professor is a perfect symbol of knowledge who knows everything and carries unimpeachable authority. Since the student is not accustomed or encouraged to take decisions independently, he hesitates and seems perplexed whenever he finds himself in a new situation.

2. It would appear that this method also discourages the habit of reading books and therefore does not produce a desire to learn new things independently. This results in poor and slow reading habits and poor comprehension.

3. No effort is made to apply this knowledge to everyday life situations. This makes lectures dull and uninteresting to the students.

4. This system does not provide a variety of educational opportunities. Instead, the field of study is fixed and narrow. A varied curriculum, covering wide range, makes it possible to enrich the associations and application of principles from one situation to another.

5. One can also see the glimpses of authoritarianism during science practical hours. The students perform practical work simply

in order to verify what has already been established as true, final and unchangeable. If they get different results, it is because something is wrong with their method. This attitude is not only unscientific, but it fails to promote critical thinking and the love of research.

6. Usually no efforts are made to make the lecture interesting by giving examples from actual life situations. This is also because the lecturers feel themselves morally bound to cover all of the syllabus prescribed by the Board of Secondary Education.

7. Most of the texts emphasize principles and theory rather than the applications of these to practical life situations. It is not unusual to find a professor teaching electricity to undergraduates when he himself cannot do house wiring, although he is expert in theory.

Modern Education

Modern education, as the term is used here, means education primarily based on a pragmatic philosophy of education. Faith and confidence in the individual personality is its main characteristic. The child himself is to an extent responsible for directing and controlling his own education. Of course, the teacher will act as a friend and guide whenever there are unusual difficulties. The teacher does not believe in spoon-feeding; rather he encourages the students to form groups and decide many matters for themselves. The most fundamental objective of modern education, according to R. Will Burnett is "developing in each student self-direction, purposiveness, and power of independent attack on problems."[8] In addition to this, the development of social competence

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[8] R. Will Burnett, Teaching Science in the Secondary School, (New York, 1957), p.34.

for participation and reasoned thought and acceptance of democratic principles, both in theory and practice, are among the important objectives of modern education. In the words of J. Paul Leonard and Alvic C. Eurich, modern education:

> has responsibilities in a democracy today heretofore unassigned to the school. These are brought about by the character of education and the ills besetting society. Thus, the nature of education arises first from the character of the society men want. Education must serve social purposes. It must equip men to improve the conditions which affect their lives, develop individual power, make possible the establishment of the principles of personal worth and freedom, develop men's ability to live by their own reason, establish social competence to develop government policies and controls, and establish firmly the attitude and actual assumption of personal responsibility.[9]

The followers of modern education encourage students to detect problems in life situation, and to study them by means of discussions and by comparing arguments by different authors on the subject. This helps the pupils to develop critical thinking and confidence in themselves. This is the reason such teachers do not prefer to follow one text book, but depend heavily on reference books. The authority lies neither in the teacher nor in the text book, but rather it is in the process of individual pursuit. The pupils, when they work in groups, develop a sense of co-operation, which is essential for democracy. J. Paul Leonard and Alvin C. Eurich emphasize this point when they say:

> Human development is accelerated where there is the feeling and practice of collective attack, where the organization of the school as a sociological unit becomes a problem for children and youth to face,

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[9] J. Paul Leonard and Alvin C. Eurich, An Evaluation of Modern Education, (New York, 1942), p.5.

> where the planning of experiences and activities are shared by both pupils and teachers, and where each feels free to discuss openly with the other, without the restraining force of superiority, the changes or practices he desires. In short, children and youth learning to live in our changing society must actually live in a democracy.[10]

Strong Points of Modern Education

Many educators have expressed what they believe to be the strong points of modern education.[11] Some of the points are as follows:

First, it is believed that the kind of program referred to above as "modern" provides facilities to take into account individual differences and offers a challenge to the good student to work up to the level of his intellectual power.

Secondly, newer methods provide opportunities for the development and release of creative energies in the students, and these are fundamental for invention and the ultimate progress of mankind.

Thirdly, it is claimed that changes are taking place so fast that one cannot predict the kinds of situations today's youth are likely to face. Instead of giving them ready-made solutions for various problems, the newer program trains them so as to enable them to find solutions for themselves. This encourages individual initiative, and faith in self.

Fourthly, it produces a well informed individual, a democratic citizen and a co-operative person.

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[10] Ibid., p.19.

[11] See, for example, books in "Works Cited" by R. Will Burnett, J. Paul Leonard and A.C. Eurich, I.L. Kandel, J.W. Wrightstone.

Appraisal of New Educational Methods

It is true that people usually prefer the status quo and do not welcome change. I.L. Kandel points this out when he evaluates modern education thus:

> That the new movement and tendencies inevitably invite criticism everywhere is natural. But it must be remembered that the movement as a whole is less than a quarter of a century old and comes into conflict with a tradition that has three centuries of practice behind it. Whatever prejudices and pre-conceptions have been established in this period can only be combated by careful study, and even more careful preparation of teachers.[12]

Several studies have been carried out in the U.S.A. comparing conventional and new methods. A Committee of the Progressive Education Association has reported, in one of its publications, the research done at the Lincoln School of Teachers College, Columbia; the Schools of Houston, Texas; the Schools of Roslyn, New York; the Schools of Santa Monica, Pasadena, and Los Angeles, California -- all showing that on the standardized tests measuring skill in fundamentals, such as arithmetic, reading etc., pupils coming from modern schools, got as high scores as those coming from traditional schools.[13]

Wrightstone, on the basis of his researches in New York schools, comparing the new and old practices writes:

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[12] I.L. Kandel, Essays in Comparative Education (New York, 1930), p.226.

[13] Derwood Baker, Robert Travers, et al., New Methods vs. Old in American Education (New York, 1941) as referred by J. Paul Leonard and Alvin C. Eurich in An Evaluation of Modern Education, (New York, 1942), p.253.

> In the fields of social studies, English, and art evidence for the intellectual factors indicates that the experimental schools provide for equal and often superior achievement on the recall of facts and information, obtaining facts, organizing facts, and applying facts and principles. Evidence for dynamic beliefs and attitudes is definitely in favor of the experimental schools. In social performance factors, pupils of the experimental school exceed those of the conventional school in both the quantity and the quality of self-initiated and cooperative activities in class room behavior.[14]

Another important study is one made by the Commission of the Progressive Education Association on School and College Relations organized by the Carnegie Corporation of New York and the General Education Board. The study is generally referred to as the "Eight-Year Study". Thirty schools of various types were selected, some of them were very progressive and others relatively conservative. The follow-up study of 1475 graduates from the thirty schools was made after setting up a control or comparison group in which each student was matched with a student from another school so as to control as far as possible, age, sex, race, aptitude, interests, size and type of home community and family background differences. In the study it was found that the graduates of the thirty relatively progressive schools

1. earned a slightly higher total grade average;
2. earned higher grade averages in all subject fields except foreign language;
3. specialized in the same academic fields as did the comparison students;
4. did not differ from the comparison group in the number of times they were placed on probation;

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[14] J.W. Wrightstone, Appraisal of Experimental High School Practices, (New York, 1941), p.190.

5. received slightly more academic honors in each year;

6. were more often judged to possess a high degree of intellectual curiosity and drive;

7. were more often judged to be precise, systematic, and objective in their thinking;

8. were more often judged to have developed clear or well-formulated ideas concerning the meaning of education -- especially in the first two years in college;

9. more often demonstrated a high degree of resourcefulness in meeting new situations;

10. did not differ from the comparison group in ability to plan their time effectively;

11. had about the same problems of adjustment as the comparison group, but approached their solution with greater effectiveness;

12. participated somewhat more frequently, and more often enjoyed appreciative experiences, in the arts;

13. participated more in all organized student groups except religious and "service" activities;

14. earned in each college year a higher percentage of non-academic honors (officership in organizations, election to managerial societies, athletic insignia, leading roles in dramatic and musical presentations);

15. did not differ from the comparison group in the quality of adjustment to their contemporaries;

16. differed only slightly from the comparison group in the kinds of judgments about their schooling;

17. had a somewhat better orientation toward the choice of a vocation;

18. demonstrated a more active concern for what was going on in the world.[15]

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[15] Wilford M. Aikin, The Story of the Eight-Year Study, (New York, 1942), pp.110-112.

Aikin has summed up these results in the following words:

> First, the graduates of the Thirty Schools were not handicapped in their college work.
>
> Second, departures from the prescribed pattern of subjects and units did not lessen the student's readiness for the responsibilities of college.
>
> Third, students from the participating schools which made most fundamental curriculum revision achieved in college distinctly higher standing than that of students of equal ability with whom they were compared.[16]

One of the important implications of these findings is that "the assumption that preparation for the liberal arts college depends upon the study of certain prescribed subjects in the secondary school is no longer tenable."[17]

The College Follow-Up Staff has reported in their conclusion that:

> It is quite obvious from these data that the Thirty Schools graduates, as a group, have done a somewhat better job than the comparison group whether success is judged by college standards, by the students' contemporaries, or by the individual students.
>
> . . . . . .
>
> Finally, a study was made of the graduates of two schools which were among the most progressive. Again, these students were contrasted with their matchees. The superiority of these progressive graduates over their comparison group was greater than any previous differences reported.
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> Clearly, among the Thirty Schools, the more experimental the school, the greater the degree of success in college. Furthermore, although students of high

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[16] Ibid., p.117.

[17] Ibid., p.118.

> aptitude seem to have profited most from experimental education, students of low aptitude profited as much from experimental programs as their matchees did from conventional schooling.[18]

It is not clear, however, that these studies have proven a statistically significant superiority of new methods over conventional ones; that is, the apparent superiority of new methods, where observed in the studies, might often be due to chance factors in measurement rather than to real differences in the qualities under study.

Difficulties in Applying New Methods in Pakistan

It is not practically possible to adopt wholesale what has been referred to as modern methods in Pakistan. The traditions and beliefs of the people will affect educational aims and practices, and should be taken into consideration. In this connection I.L. Kandel writes:

> Each nation today constitutes an experimental laboratory which yields solutions to the same problems in different ways determined by peculiar social traditions and conditions. It is for this reason that the educational systems and practices of one nation cannot be transported to another nation or to other peoples without profound adaptations and modifications; such a course runs the risk of offending local traditions, local genius, the peculiar social, economic, and political conditions of the nation to which the foreign system is transferred.[19]

One of the basic traits of present Pakistani culture is the belief in complete subordination to authority. Therefore, a system entirely based on a progressive philosophy of education, which is diametrically opposed to this belief is likely to do more harm than good, unless gradually introduced.

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[18] Dean Chamberlin et al., Did They Succeed in College? (New York, 1942), pp.208-209.

[19] I.L. Kandel, Comparative Education, (Boston, 1933), p.14.

In addition, a completely modern program would be difficult to apply because schools and colleges in Pakistan cannot provide sufficient facilities for the reference books, magazines, and other reading material. Most of the pupils have poor parents who cannot afford to keep themselves in touch with the latest developments within and outside the country.

Another difficulty which Pakistan would face in adopting modern methods is the shortage of appropriately trained teachers. Also, drastic changes in the examination system would be required. Under these circumstances it does not seem advisable to attempt an immediate and broad-scale adoption of modern educational ideas in Pakistan. This is not to belittle the importance of modern ideas in suggesting valuable improvements which can be carried out safely without catastrophe.

Concluding Statement

The analysis and comparison of methods in this chapter indicate that the prevailing methods of teaching in Pakistan are notably one of the important causes of failures. These methods fail to develop interest among the students, retard activity on their part, curtail their habits of reading, and fail to encourage the spirit to know and discover. The pupils fail to apply principles to new and novel situations and hesitate to offer their solutions and suggestions. All this contributes to poor showings in the examination.

Moreover, the difference in educational practices in school and college is also an important factor aggravating the situation. In schools the students are subjected to the teacher's strict vigilance. The lack of confidence and trust shown by the teacher makes students do work

only if it is clear that the teacher intends to check and punish. In college, on the other hand, the lecturer seldom asks students to show their work. This indifferent attitude of the lecturer is most probably quite harmful to the students because they can take advantage of this leniency to neglect their studies until the last moment before the examination.

CHAPTER IV

THE EXAMINATION AS A CAUSE OF FAILURES

Introduction

Examinations are always looked upon by Pakistani students as necessary evils. Much criticism of the examinations has been made by students and teachers, but to what extent this critisism has improved the examination system in the direction of increased fairness to the pupil is difficult to estimate.

A good examination, in general, must possess validity, reliability, comprehensiveness and administrative feasibility. To be valid, it must measure what it is really intended to measure. To decide if it is satisfactory or not, again, requires verifications from studies, and judgments of competent persons. To be reliable, it must measure accurately and consistently, with a minimum of error. To do justice to the pupils, the examination should be comprehensive and cover a wide range and variety of topics on the subject. A well-balanced distribution of questions is an essential characteristic of a good examination. To be administratively feasible, it must be reasonable in length of time required, both for the examiner and the scorer.

Examinations can be classified into different categories according to what is to be measured, content, method of administration etc.

According to content examinations can be divided into two major groups:

a. Conventional or Essay-Type Examinations.

b. Modern or Objective Examinations.

1. True-false, Yes-no, or Right-wrong type;

2. Multiple-choice type;

3. Matching exercises;

4. Completion exercises;

5. Best answer type;

6. Recall-question type.

The conventional or essay-type examination in Pakistan includes a variety of different questions ranging from a single three-hour question to a question which can be answered in one or two sentences. Questions such as "Discuss the independence movement in India during the British rule" and "State Newton's third law of motion", may be taken as examples. Such questions are primarily used to measure the proficiency or relative achievement in a particular course or field of subject matter. J.M. Stalnaker defines an essay question as:

> a test item which requires a response composed by the examinee, usually in the form of one or more sentences, of a nature that no single response or pattern of responses can be listed as correct, and the accuracy and quality of which can be judged subjectively only by one skilled or informed in the subject. The most significant features of the essay question are the freedom of response allowed the examinee and the fact that not only can no single answer be listed as correct and complete, and given to clerks to check, but even an expert cannot usually classify a response as categorically right or wrong. Rather, there are different degrees of quality or merit which can be recognized.[1]

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[1] John M. Stalnaker, "The Essay-Type of Examination", Educational Measurement, ed. E.F. Lindquist, (Washington, D.C., 1951), p.495.

The underlying idea of this system of examination is the traditional conception of education, where outlines of courses determine what is to be taught in each subject during a fixed interval of time, and what text books are expected to be covered. Under these circumstances the education consists of memorizing important events, dates and names, causes and results of wars, spelling words and grammar etc., as found in the text books. A teacher who has some experience of teaching at a particular level knows what is likely to be stressed in the examination and what is to be explained and how, so that his pupils may reproduce them as perfectly as possible. The efficiency of a Pakistani teacher is also measured in terms of the proportion of his successful students and not on the quality of the performance of his pupils. The teacher who can manage to place most of his pupils above the passing grade on an external examination[2] is considered to be a good teacher, irrespective of how far he succeeds in developing the individual capacities and abilities of his students.

The modern objective examination may be defined as the means attempting to measure and evaluate the quantitative aspects of human behavior such as intelligence, specific aptitudes, achievements, personality and adjustment, interests and values, with greater accuracy than can be done by essay examinations. Such tests are popular in America. Modern objective examinations may be traced back to 1897. Douglas E. Scates[3] has noted the trends of development in such measurement

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[2]External examination means examination not conducted by the teacher himself but by some external authority.

[3]Douglas E. Scates, "Fifty Years of Objective Measurement and Research in Education", Journal of Educational Research, 41: 241-264, (December, 1947).

through five decades. The first decade, beginning in 1897, saw the proposals of Rice and resulted in the publication of the first Binet Intelligence Scale. The second period from 1907 to 1916, is attributed to the experiments and works of Thorndike and his followers which culminated in the publication of the first standardized achievement tests and scales and emphasized objectivity in evaluating educational proficiency. The third period ranging from 1917 to 1926 was marked by rapid expansion of educational measurements. The fourth from 1927 to 1936 was important because during this period, it was realized that evaluation and assessment of all aspects of growth related to educational training is important for proper guidance. Improved techniques for measuring personality aspects, intelligence and achievement were the outcome of this period. The fifth period from 1937 to 1946 was characterized by the emphasis on projective personality techniques. According to J.W. Wrightstone and others,[4] the fifth decade from 1940 to 1950[5] "was marked by a maturing and a refinement of the techniques developed during the 1930's".[6]

In True-False, Yes-No, and Right-Wrong type of examination questions, a statement is given and the examinee is supposed to decide whether this statement is true or false, right or wrong, or whether the answer is yes or no, and to mark his paper according to directions.

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[4] J.W. Wrightstone and others, Evaluation in Modern Education, (New York, 1956).

[5] They have traced the development of modern techniques in decades such as 1900-10, 1911-20, 1921-30, ... etc.

[6] Ibid., p.7.

Example

TRUE FALSE : Pakistan came into existence in July, 1947.

RIGHT WRONG : Two bodies with different weights, if let fall simultaneously from a tower, will strike the ground simultaneously with the same speed.

YES NO : Is it possible that the product of two positive numbers is less than their sum?

In Multiple-Choice questions, the student selects one out of several possible answers and marks according to the instructions.

Example

The telescope was invented by

____a. Newton.
____b. Laplace.
____c. Galileo.
____d. Kepler.
____e. None of these.

In matching exercises the candidate has to select and re-arrange numbers or letters to match up related items.

Example

____Babar.	1. was the first muslim to attack India.
____Muhammad Bin Qasim.	2. fought for the establishment of Pakistan.
____Mahmud Ghaznawi.	3. was the founder of Moghal Empire in India.
____Quad-e-Azam.	4. attacked India seventeen times.

Best-answer type questions consist of several statements all of which are true to some extent; the student is required to select the best one.

Example

Crop rotation is practised by farmers in order to

____a. lengthen the period of fertility.
____b. adapt the crops to the season.
____c. prevent the land from lying idle through the winter.

The Recall question test or completion test usually tests the memory of the candidate; he has to supply an appropriate word or more.

Example

1. The first prime minister of Pakistan was _____ .

2. The constitution of Pakistan was passed in the year _____ .

3. Water is chemically composed of _____ .

Importance and Purpose of Examination

The perennial Pakistani controversy "for the examination" and "against the examination" is as evident today as ever. There are some who advocate that examinations should be abolished. In their opinion the examination is the greatest obstacle in the free progress of the individual's growth. Students are forced to study to pass the examination and no efforts are made to develop and enhance their powers of creativity and individuality. This encourages cramming and discourages the formation of good habits. In the words of I.L. Kandel:

> . . . any form of test tends to wrap the main functions of education -- the promotion of growth, the development of personality, and training in "how to think rather than what to think".[7]

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[7] I.L. Kandel, Examinations and Their Substitutes in the United States, (New York, 1936), p.81.

On the other hand many people claim that examinations are essential for guidance in methods of teaching and overall improvement in education. They argue that preparation for examinations trains students to deal with new material, to understand the subject as a whole, to connect the relations of hitherto un-related details, and to organize their knowledge as a whole. The pupils learn in this way to discriminate what is more important and what is less important, so that they may reproduce it on demand. This preparation also helps the students to think and appreciate the relation of the parts to the whole. At the same time the advocates of examinations say that examinations are important because the teacher gets an impartial estimate of his pupils' knowledge. This also helps students to understand their relative positions and to realize what they know and what they do not know. The examination is therefore seen as a source of encouragement and motivation not only for the teacher, who may use it to improve his teaching, but also for the students, who will master the material more thoroughly. I.L. Kandel points out the idea of President Arthur T. Hurdy of Yale University when he writes that "examinations should fulfill two functions, one looking to the past -- a stocktaking, as it were, of what the pupil has studied and mastered, and the other looking toward the future -- a test of power to go on".[8] According to W.W. Cook, the main functions of examinations are:

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[8] Ibid., p.58.

> (1) establishing learning situations appropriate to the needs, abilities and potentialities of the individual student; (2) the diagnosis and alleviation of specific learning difficulties; (3) the motivation and directing of learning experiences; and (4) the development and maintenance of skills and abilities.[9]

Strong and Weak Points in Conventional or Essay-Type Examination

In spite of repeated attacks and criticism during the last fifty years, the essay-type examination still enjoys a prominent position, even in the American system of education.[10] One of the most important features of the essay-type examination is that it is a kind of projective technique, which can be used to evaluate personality. The examinee is placed in a problematic situation where he tries to project his total personality as modified by his education. In the words of Stalnaker: "in responding to any test question, regardless of form, the examinee brings his personality into play and uses his own experience and sense of values to some extent. But the extent to which this is true varies greatly from question to question."[11] It is therefore a kind of free response to a stimulus situation which indirectly reflects the functioning of one's mental abilities and thus helps to measure the change produced by instruction and education.

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[9]Walter W. Cook, "The Functions of Measurement in the Facilitation of Learning", Educational Measurement, ed. E.F. Lindquist, (Washington, D.C., 1951), p.7.

[10]Donald L. Grant and Nathan Caplan, "Studies in the Reliabilities of the Short Essay Examination", Journal of Educational Research, 51: 109-115, (October, 1957).

[11]J.M. Stalnaker, "The Essay Type of Examination", Educational Measurement, ed. E.F. Lindquist, (Washington, D.C., 1951), p.496.

Another important aspect of essay-type examinations is that an opportunity is provided for the student to apply his higher-order mental abilities. He uses his knowledge of the subject matter, and his judgment to discriminate what is relevant and what is irrelevant, applies his powers of originality, organization and reasoning, clear thinking and clear expression. These can be tested only by oral or essay-type examinations. It is believed that there is no substitute for the oral or essay examination in evaluating originality, organization of thought, clear thinking and clear expression; all of which are important outcomes of educational effort.

Some people believe that the essay examination encourages better study habits than objective tests do. It is generally believed that they test deeper knowledge of the subject matter.[12] There are those who prefer essay examinations because it is easier to construct an essay question paper and easier to administer it. Whenever the answer involves a large amount of writing, cheating on the part of students is minimized. On the other hand, if the answer consists of check marks or simple words, students find it easier to communicate the correct answer to others, even under strict supervision.

The foremost criticism of essay examination concerns the poor reliability of evaluations given. A good test must measure accurately and consistently what it is supposed to measure. A number of studies have been done to test the reliability of essay examination. "Kelly, Johnson, Starch, Dearborn, Meyer, Gray, and others, have found the

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[12]It is argued that objective tests can also test deeper knowledge in some fields, but at present, at least, they rarely do so.

marks of teachers to vary widely on the same examination paper."[13] Another study made by Stalnaker, in which 6834 answers of a question were read by a group of readers, after deciding on some principles for evaluating them. Each answer-book was evaluated by two readers independently. "The correlation between the grades given by the first and second readers was +.55."[14] Sims, in one of his studies, in which two essay examinations and one objective test was given to 80 students, found that the average correlation of scores between the essay examination and an objective test over the same subject matter was +.70, although the answer-books were divided into four equal groups and each group was read independently by more than three readers.[15]

Sims made another study based on the following data:

1. the marks given by twenty-one teachers to a set of twenty-four examination papers in sixth grade arithmetic, reported by F.E. Bolton in his article "Do Teachers' Marks Vary as Much as Supposed?", Education XLVIII (Sept., 1927).

2. the marks given by twenty-five teachers to a set of twenty-five examination papers in high school algebra, reported by W.O. Shriner, in his article "Comparison Factor in the Evaluation of Examination

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[13] Some of their studies are discussed in detail by G.M. Ruch, The Improvement of Written Examination, (Chicago, 1924), pp.40-64.

[14] J.M. Stalnaker, "The Objective Type of Examination", Educational Measurement, ed. E.F. Lindquist, (Washington, D.C., 1951), p.499.

[15] Verner Martin Sims, "The Objectivity, Reliability, and Validity of an Essay Examination Graded by Rating", Journal of Educational Research, 24: 216-223, 1931.

Papers" in Teachers College Journal, (January, 1930), pp.65-74.

3. the marks given by twenty-five teachers to a set of twenty-five examination papers in freshman high-school English, also reported by Shriner in his above article.

4. the marks given by nine readers to a set of twenty examination papers in General Psychology, collected by V.M. Sims himself.

Sims found that if objectivity meant only the agreement of judges about the rank of the paper in the group, then the study proved a high degree of objectivity for the essay examination.[16] The average correlation of each reader with the average of all readers, in each of the four subjects, was higher than +.91. However, the marks given to individual papers by various readers differ to a great extent. The average variation of all the arithmetic papers was twenty-six points, while the maximum range for one paper was forty-five points (one reader graded it as 25, while another reader evaluated it as 70). Similarly the average difference for all the algebra papers was twenty-seven, while the maximum difference was of forty-six points (from 39 to 85). The average for English papers was found to be twenty-one, and the maximum difference in the grading of one paper by different readers was thirty-nine points, (from 39 to 78). Again for the Psychology papers, the average range was 28 points and the maximum difference in the case of one paper was 50 points, (17 to 67).

The reasons for this variability depend not only on the subjective

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[16] Verner Martin Sims, "Reducing the Variability of Essay Examination Marks Through Eliminating Variations in Standard of Grading", Journal of Educational Research, 26: 637-47, 1933.

nature of the pupil response, but on the subjective nature of the examiner also, his own standard of grading and values, his health and mood. The sequence of good and bad examination papers is also an important factor, because after marking a good paper, the next one is felt by contrast to be poorer than it is. A teacher will usually give different grades to the same examination paper if he grades independently at two different times. Sims in his article "Reducing the Variability of Essay Examination Marks Through Eliminating Variations in Standards of Grading",[17] has suggested that the use of grades like A, B, C, ... instead of marks, tends to decrease the unreliability when the same paper is graded by different teachers. What he is doing, in fact, is making the marks more rough by grouping them into six or seven categories. The same logic would recommend the minimum number of groups (say two or three) in order to have minimum difference of opinion among the examiners, but this fails utterly to measure the individual differences more sharply, and cannot be accepted as a reasonable solution.

Another objection raised against the essay examination is that evaluation of examination papers is expensive and takes more time. Sampling is another important objection, because usually in essay examination, the examinee is supposed to express and project his personality, not on all the questions but on a few of them about which he knows the best, so that his total personality may be revealed to the reader. Finally, some critics claim that in the examination room, where examinees are usually under nervous strain, they cannot produce good

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[17] Ibid.

pieces of prose which will reveal their personalities fully in a limited time.

Strong and Weak Points of the Objective Methods of Measurement

In America, objective techniques are becoming more and more popular. Research is being done to improve these methods so that measurement of human behavior may be refined. In this regard, K.L. Bean has pointed out:

> It is characteristic of the human race to be wildly enthusiastic about every new theory that appears to work. If a new discovery is found to have value, there will be many people who think that it contains all the answers to all problems and that it should entirely replace older views. The originator of the theory or discovery may or may not share this opinion.[18]

The objective method of measurement, as pointed out earlier, was the reaction to the criticisms of the essay type of examination. The most important feature of this measurement is the objectivity in evaluation. In essay examination, only an expert can assign a score, but objective tests are devised to measure a comprehensive range such as achievement in a subject matter, acquisition of skills and information, attitudes, personality and character, etc. and these can be administered and evaluated easily by ordinary clerks. In addition to this, objective tests are free from irrelevant answers which often distract the attention of examiners in grading long answers in essay examinations. Comprehensive knowledge about student's individuality gained from an objective examination can be extremely helpful in promoting and developing his capacities and giving him proper guidance.

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[18] Kenneth L. Bean, Construction of Educational and Personal Tests, (New York, 1953), p.107.

Moreover, it is felt that a few questions cannot cover the subject matter fully, while an objective test which consists of several hundred statements can better sample the whole subject matter. Orleans and Sealy summarize this point as follows:

> the objective questions are specific, and therefore a large number can be included in one test. This makes it possible for the test to be fully representative of the subject matter being tested.[19]

The fundamental objection to the modern objective examination is that it fails to measure most of the things measured by essay examination, such as clear thinking, logical reasoning, systematic arrangement, good and appropriate headings, clear handwriting etc. Although evaluation is easy, the construction of the test requires special skill, and much time is needed to construct a good test. Another objection to objective tests is the part played by chance factors. Students can guess in case they do not know the answer. A method based on the theory of chance and probability is sometimes used to obtain a corrected score which purports to eliminate the effect of chance factors:

$$\text{Corrected Score} = \text{no. of right items} - \frac{\text{no. of wrong items}}{n-1}$$

where n is the number of possible choices in each question.

In the case of true-false questions, (i.e., n = 2), this formula reduces to:

$$\text{Corrected Score} = \text{no. of right items} - \text{no. of wrong items.}$$

This also discourages the habit of wild guessing among the students. But in the interest of measurement accuracy it should be made clear to them

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[19] J.S. Orleans and G.A. Sealy, Objective Tests, (New York, 1928), p.50.

whether this formula is being used; otherwise the test will to some extent measure willingness or unwillingness to take a chance rather than what it purports to measure.

Some critics advance another argument against objective tests. They believe that psychologically it is unsound to give illusions by presenting distorted and wrong statements. The defenders, on the other hand, claim that this constitutes training to make respondents exact, and to enable them to distinguish between true and false statements in actual life situations.

System of Examination Conducted by the Board of Secondary Education, Lahore

Apart from some special categories of students, permitted under regulations,[20] a student is allowed to appear in the Intermediate Examination provided

1. he has passed the Matriculation Examination not less than two academic years previously;

2. he has been a regular enrolled student of a recognized institution;

3. he has completed at least two-thirds of the lectures in theory as well as two-thirds of the periods of practical work in science subjects;

4. he produces a certificate of good character signed by the head of the institution; and

5. he sends his admission form for the examination, through the head of the institution, before the specified date announced by the Board.

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[20] Board of Secondary Education, Higher Secondary Examination 1959-60, (Lahore, 1958), pp.1-5.

Teachers (under certain conditions[21]) and women candidates can appear as private candidates even though they may not have attended any institution.

There are three types of examiners:

1. Paper Setters.

2. Head-Examiners.

3. Subordinate-Examiners or Sub-Examiners.

A paper setter is an examiner who is appointed by the "Committee for Appointment of Paper Setters, Head Examiners,[22] and Superintendents[23]" from the list forwarded by the "Committee of Courses", as scrutinized by the "Revising Committee". He is responsible for submitting, before a specified date, the question paper for the examination in the subject for which he is a paper setter. A head examiner, who is also appointed in a similar manner, is supposed to maintain the uniform standard of marking among the group of sub-examiners by issuing instructions and suggestions for modifications. Sub-examiners are appointed by the "Committee for Appointment of Sub-Examiners" from the panels of names recommended by the "Committee of Courses" and duly scrutinized by the "Revising Committee". He is supposed to evaluate approximately four

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[21] Ibid., p.3.

[22] The Committee consists of (1) Chairman of the Board, (2) Vice-Chancellor of the Panjab University, (3) Director of Education, Lahore Region and (4) two nominees of the Board to be appointed every year.

[23] Superintendents are appointed to conduct the examination in different examination centres.

hundred answer-books under express instructions and subject to the approval of his head examiner.

Qualifications for the Examiners

The examiner for the Higher Secondary Examination (i.e., Intermediate) must be at least an M.A. or an M.Sc. in the subject and

1. must have at least ten years' teaching experience in that subject if he is a Paper Setter;

2. must have at least seven years' teaching experience in that subject if he is a Head Examiner;

3. must have at least three years' teaching experience in that subject if he is a Sub-Examiner.

Moreover, "no person shall, ordinarily, be appointed as a Paper Setter or Head Examiner if he has not worked as a Sub-Examiner for at least three years".[24]

Rules for Paper Setters

> "22. Questions should aim at testing the ability of a candidate (a) to understand a topic and (b) to apply his knowledge to solving practical problems and not merely at testing his ability to reproduce the answers which have been given to him in notes or learnt by him from a book.
>
> "23. In Question Papers on Languages, direct questions involving work of memory rather than of intelligence, should be discouraged.
>
> "24. Every part of every question shall conform to the prescribed courses of study.

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[24] Board of Secondary Education, The Calendar 1959-60, (Lahore, 1958), p.122.

"25. Every portion of every question shall be clear and definite in language as well as in regard to the nature of the answer required of the candidates. The question paper shall be fairly distributed over the whole range of the subject and not concentrated on any one portion or a few portions only.

. . . . . .

"28. For the Higher Secondary . . . Examination at least 50 per cent more questions shall be set than what the candidates are required to answer.[25]

"29. The standard of Question Papers, as a whole shall not substantially vary from year to year. If the standard is desired to be altered, such change shall be brought about over a number of years.

. . . . . .

"32. Each Paper Setter shall at the time of setting a Question Paper also draw up Instructions to Sub-Examiners for marking the scripts. He shall do so even if there are no Sub-Examiners in that particular Paper.[26]

"33. The Instructions to Sub-Examiners shall be short and clear. Every question shall be properly analyzed and marks allotted to various parts.

"34. In written papers containing mathematical questions the Paper Setters shall send solutions along with the Question Papers.[27]

"35. The Paper Setters shall assign marks to each question which shall be indicated on the question paper for the information of the candidates.[28]

. . . . . .

"37. Each Paper Setter shall be required to certify:

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[25]This means that if the candidates are required to answer only six questions, the examiner can set as many questions as he likes but not less than nine.

[26]This is only to cover the risk that in case the Paper Setter is not available at the time of evaluating the answer-books, unnecessary delay may be avoided by appointing another person to evaluate the examination papers according to the Paper Setter's instructions.

[27]This is so that the examiner not only comes to know the length and calculations of the problem, but also corrects for any misprint in the problem.

[28]This is for the students' guidance, because the effort given to an answer should depend upon the marks it carries.

1. that the Question Paper was kept under lock and key while in his possession;

2. that none of the questions has been set by him for any examination of any other examining body;

3. that the Paper (if typed) has been typed by him without any external help and that carbon papers, if used, have been destroyed;

4. that the paper, (if hand-written) has been written by him personally;

5. that he has kept no copy or notes of the Paper with him and he accepts the fullest responsibility for the accuracy and secrecy of the Question Paper;

6. that he has checked the Paper and has satisfied himself that it is strictly in accordance with the syllabus prescribed for the examination and that the Paper, in his judgment and belief, is up to the standard of that examination;

7. that he has taken special care to exclude all obscene and vulgar passages;

8. that he has no near relative appearing in the paper, set by him in the examination;

   (Explanation: The term 'Near Relative' includes Son, Daughter, Wife, Husband, Brother, Sister or a person with whom the Paper Setter has such relations as would give him easy access to his secret Papers).

9. that he has not written or revised any text book or help book for the particular branch of knowledge for which he has set the Paper;[29]

10. (i) he is not teaching the subject to the class for which he has set the Paper.[30]

    (ii) he has not taught the subject to the classes for which he has set the paper during the previous two years.[31]

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[29] This is so that the Paper Setter may not be able to cause indirect publicity for his book by taking some questions from it.

[30] This is because it would be easier to guess the important questions, from his emphasis in the class, if he is teaching the same subject.

[31] Every student gets instructions for two years, before he appears in the examination.

"38. Each Paper Setter shall forward his paper to the Controller by name in a prescribed cover which shall be properly sealed, registered and insured. The Controller is authorized to reject or return any paper to the examiner which is not forwarded in the described manner".[32]

Rules for Head Examiners

"39. There shall be one Head Examiner for about six thousand candidates.

"40. In no case shall the Head Examiner himself increase or decrease the marks assigned to any Paper by a Sub-Examiner. In case of a difference arising between a Head Examiner and one of the Subordinate-Examiners, the Chairman may either appoint a third Examiner whose award shall be final or refer the matter to the Committee of Courses concerned for a decision which shall be subject to the final approval of the Chairman.

"41. The Head Examiner shall be responsible for submitting the results in his subject in time. He shall also certify that he has re-examined the required percentage of answer-books".[33]

Remuneration to Examiners

The remuneration to examiners for written papers of the Higher Secondary Examination is

1. Rs. 75/- for setting a paper.[34]

2. Ans. -/12/- for examining one answer-book, with a minimum of Rs. 12/-.

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[32] Board of Secondary Education, The Calendar 1959-61, (Lahore, 1958), pp.123-25.

[33] Ibid., p.126. For details please see pages 69-70 of the thesis.

[34] At present 1 American Dollar = 4.77 Pak. Rupees approximately.
And 1 Pak. Rupee = 16 Annas (Pak.).

The remuneration to examiners for conducting the science practicals examination for F.Sc. is

1. Rs. 40/- for setting the first paper and Rs. 20/- for setting each subsequent paper.[35]

2. Rs. 1/4/- for examining each candidate with a minimum of Rs. 20/-.

Procedure of Evaluation of Answer Books

As soon as the examination in a particular subject is over, the Superintendent conducting the examination sends all the answer-books to the Secrecy Officer, Board of Secondary Education, Lahore. The Secrecy Officer distributes these answer-books among the sub-examiners alloting approximately four hundred to each one. The sub-examiners do not know the names of the candidates or their colleges or districts. The sub-examiner is required to send within 48 hours, a sample of 15 actual examinees' answer-books (called the 'Test Instalment') marked according to Head Examiner's instructions, which are usually received along with the answer-books. The Head Examiner returns these answer-books with his guiding remarks if any. If the Head Examiner approves of the sub-examiner's standard of marking, the sub-examiner, in the light of any revision of the instructions, evaluates the remaining answer-books and despatches them to the Head Examiner by instalments of nearly 125 answer-books. The Head Examiner is supposed to re-examine at least 7½ per cent

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[35]Since it is not possible to examine all the candidates in science practicals at the same time, they are divided into different groups, depending on the accomodation in the laboratory. Each group is assigned different question papers for doing the practical work, on different dates and times, as announced by the Board.

of these answer-books in order to see that the sub-examiner has evaluated according to his instructions. The Head Examiner may approve all the answer-books or may send back some of these for revision. But in case he feels that the sub-examiner is too strict or too lenient in his marking, he may return all the answer-books for revision, with revised and detailed instructions. In this way the result is sent to the Board's office only if both the sub-examiner and the Head Examiner agree. In case of difference, the Chairman of the Board may either appoint a third examiner or refer the matter to the "Committee of Courses" concerned, whose decision, if approved by the Chairman, will be final.

Critical Remarks

On the whole, so far as its regulations are concerned, the present examination system seems to be satisfactory. The extent to which these regulations are observed in practice is a problem to be investigated. Especially, Rule Nos. 22 and 23 for the paper setters are seldom taken into consideration.[36] Most of the question papers can be answered best by verbatim reproduction of the text book material, which encourages cramming habits among the students. They develop bad habits of preparing only expected questions rather than the whole syllabus, and this is the reason that students depend heavily on guess work and "guess papers". If examinations required original thinking and the application of knowledge to solving practical problems, it would be difficult to guess the examination questions. There are publishers who claim that their "guess papers"

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[36]That is, the regulation concerning the type of questions to be set in the Question Paper.

contain questions included in the Board's question paper to the extent of 80 or 90 per cent of the maximum marks. It is true that both teachers and students concentrate their energies not so much upon genuine study as upon the questions likely to be set by the examiners. In other words, teaching is subordinated to examination, and not examination to teaching. The cram work in the answer-books of the students is so apparent that most of the examiners were obliged to report its obvious nature to the Board. The following are some of the extracts taken from the reports of Head Examiners in English, Mathematics, Chemistry and Biology, for the Intermediate Examination held in 1958, giving their opinions about the quality of answer books:

> "Cram work, Sir, and even that not correctly reproduced."
>
> "Mostly a cram work, but it depends on the degree of the command that they have on the language."
>
> "Most of the students do not possess the ability to make an intelligent use of the knowledge gained from their books. Even when the students have grasped the subject, they prefer to rely on cram work and whatever they write is just mechanical reproduction of what they have learnt by hearing."
>
> "Ability to use knowledge is, in the greater number mechanical. At best it is a cursory acquaintance with English language and literature. Even where it is not merely a cram work, the grasp of the subject is very superficial without deep roots."
>
> "The candidates mostly get through by cram work. The knowledge gained is mostly applied mechanically. Anyhow in some cases it is real."
>
> "In my opinion only 20 per cent of the candidates showed proper comprehension of the subject matter, another 20 per cent were of mediocre type and the rest gave the impression that they had crammed the subject matter in an unintelligent manner."
>
> "They had mostly crammed factual knowledge with a view to get through the examination with no taste or appreciation of the subject itself."

> "Majority of the students exhibited the cram work. Not more than 25 per cent of the students showed the real knowledge of the subject."
>
> "Most of the students have attempted to put the facts in their words, but a fair number of them used sentences after sentences from the prescribed books thus showing a mere cram work on their part."[37]

The bad habits produced in this way become so strong among the students that they never care to study the whole course. Moreover, they depend mostly on expected questions, the solutions of which they try to memorize by cramming only near the examination, so that they may be able to reproduce the answers safely. Sometimes they do not find the expected questions in one or more papers, and consequently they fail in that paper. A failure in one subject means a failure in the whole examination, unless the single failure is by less than three marks. Apart from that, cramming habits are encouraged when students find much room for choice in the question papers. For example in Mathematics Paper A (or Mathematics Paper B), there are usually 12 questions. The student is required to attempt only six, and he can pass the paper by solving only two questions (33 per cent of 6 questions) completely and correctly. The weak students therefore, try to prepare only one-quarter of the total course viz. the portion from which three questions are set, so that they may be able to solve two questions to get through. In fact, a student who has prepared only two questions (i.e., 1/6th portion of the course) thoroughly can pass. The position of such an unfortunate student in B.Sc. can well be imagined; he has passed the Intermediate

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[37] Extracts are taken from the typed copies of the Head Examiners' Reports for the Intermediate Examination 1958, in the subjects of English, Mathematics, Chemistry and Biology.

Examination even though totally neglecting 5/6ths of the course. Thus the present state of affairs develops the bad habits of preparing only a portion of the course, depending on guess papers, giving importance to cram work, to reproducing what can be learnt from cheap Bazaar notes, and help books etc., which ultimately results in poor attainments and numerous failures in the examination. The figures in Table V[38] give the percentage of candidates placed in different divisions.[39]

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[38]Figures taken from data collected by F.R. Korf, Acting Chairman, Department of Education, American University of Beirut, through correspondence during 1958-59.

[39]Generally the successful candidates are placed in one of the three levels of passing an examination:

First Division	if the aggregate marks are 60 per cent or more
Second Division	if the aggregate marks are 50 per cent or more but below 60 per cent.
Third Division	if the aggregate marks are below 50 per cent.

TABLE V

TABLE SHOWING THE PERCENTAGE OF STUDENTS, PLACED IN FIRST, SECOND AND THIRD DIVISIONS, IN THE INTERMEDIATE EXAMINATIONS OF THE BOARD OF SECONDARY EDUCATION, LAHORE, DURING THE YEARS 1956-58

Year	Percentage placed in I Division	Percentage placed in II Division	Percentage placed in III Division	Percentage without Division[40]	Percentage of Failures
1956	1.12	5.50	18.35	0.03	75.00
1957	1.62	8.27	26.97	0.04	63.10
1958	2.31	8.09	22.07	0.03	67.50

[40] The Board conducts special examinations in nine oriental languages. The students who are unable to join the college and are interested in any one language, study for these examinations privately. The three levels of examination are Adib, Alim and Fazil. Every student is allowed to sit

for Adib Examination provided he has passed the 8th class;
for Alim Examination provided he has either passed the Matriculation Examination or has passed the Adib Examination in that language;

for Fazil Examination provided he has passed the corresponding Alim Examination.

There are some candidates who after passing Alim or Fazil Examinations in any language can appear in the Intermediate English Examination only. If successful, they are granted a certificate to this effect and are considered to have passed the Intermediate Examination under regulations. Such candidates do not have any division. The Board has recently modified these regulations in order to discourage this practice. Similarly a candidate who passed a B.A. English Examination after passing Fazil Examination in any language, was considered to have passed the B.A. Examination without division.

There are some people who claim that to a very great extent, if not perfectly, the present examination does distinguish between students in three clear-cut divisions. In Table VI and VII, figures are given from two follow-up studies. In the first case of 4307 students who were admitted to 18 colleges during three years (1949-51), only 3094 appeared in the Intermediate Examination two years later. The remaining 1213 students (67 first division, 473 second division, and 673 third division) either left the college or did not appear in the examination for one reason or another. In the second study of 561 science students who were admitted in Third Year in 13 colleges during three years (1949-51), only 281 appeared for the Degree Examination held two years later. The remaining 180 students (4 first division, 39 second division, and 137 third division) either left the college or did not appear in the Degree Examination for one reason or another.

TABLE VI

FOLLOW-UP STUDY OF ADMISSIONS TO INTERMEDIATE ARTS DURING THREE YEARS (1949-51), AND SUBSEQUENT PERFORMANCE AT THE F.A. EXAMINATION FROM 18 COLLEGES.[41]

Division in Matriculation	No. admitted to 1st year class	Percentage of total admission	No. of drop outs	Percentage of drop outs	No. appeared in the F.A. Examination	Percentage of total appeared	No. passed	Pass percentage of (6)	Pass percentage of (2)	No. placed in 1st division	No. placed in 2nd division	No. placed in 3rd division
1	2	3	4	5	6	7	8	9	10	11	12	13
I	428	10	67	16	361	11	252	70	59	23	117	112
II	1891	44	473	25	1418	46	551	39	28	7	135	409
III	1988	46	673	34	1315	43	260	19	13	0	28	232
Total	4307		1213		3094		1063			30	280	753

[41] Figures taken from M. Afzal Hussain, Higher Education Examined, (Lahore, 1956), p.37.

TABLE VII

FOLLOW-UP STUDY OF ADMISSIONS TO III YEAR CLASS DURING THREE YEARS (1949-51), AND SUBSEQUENT PERFORMANCE AT DEGREE EXAMINATION[42]

Division in F.Sc.	No. admitted to III year class	Percentage of total admission	No. of drop outs	Percentage of drop outs	No. appeared in the F.A. Examination	Percentage of total appeared	No. passed	Pass percentage of (6)	Pass percentage of (2)	No. placed in 1st division	No. placed in 2nd division	No. placed in 3rd division
1	2	3	4	5	6	7	8	9	10	11	12	13
I	26	6	4	15	22	8	15	70	57	6	7	2
II	105	23	39	37	66	23	34	51	32	1	15	18
III	330	71	137	42	193	69	80	41	24	0	21	59
Total	461		180		281		129			7	43	79

[42] Ibid., p.18.

These figures clearly point out three important conclusions.

1. Matriculation, Intermediate, and Degree Examinations are consistent. Good students in one examination, also usually show better results in the next examination, while poor students often exhibit poor results in the next examination.

2. The drop outs are maximum in the case of III division students, which shows that it becomes very difficult for them to pull on in the next higher class.

3. III division students either drop out before the examination or fail in the examination. The remaining students mostly get III division in the next higher examination. Table VI shows that out of all the III division matriculates who were admitted in I year class, only 13 per cent could pass the Intermediate Examination. None could take the first division, only 1 per cent could pass in II division, while the remaining 12 per cent got III division.

No study seems to have been done to determine the reliability of evaluation under these arrangements. Rule No. 33 for paper setters, which reads, "The Instructions to Sub-Examiners shall be short and clear" is liable to create some differences of opinion between the head examiner and the sub-examiner. It is the writer's experience that the more detailed and clear the instructions are, the less difference of opinion is found, and that there is thus more reliability of sub-examiner's markings with detailed, even long-winded instructions. It is felt however, that the Head Examiner's re-examination of $7\frac{1}{2}$ per cent of the answer-books submitted by sub-examiners is not sufficient.

Concluding Statement

As discussed in this Chapter, examinations are classified into two groups, (1) Conventional or Essay-Type Examinations and (2) Modern or Objective Examinations. The essay-type examination consists of subjective questions which may range from a single question of three hours to questions which can be answered in a few words or sentences. The objective examination, on the other hand, includes Yes-No, Right-Wrong, True-False, and Multiple Choice questions, to mention a few. Both systems have weak as well as strong points. One system cannot completely replace the other. One measures the organization of thinking, while the other emphasizes recall and tries to measure clinical, educational and diagnostic aspects of human behavior. One is easy to construct but difficult to evaluate. One is generally a test of assimilated knowledge, the other of cumulated knowledge. Several studies have shown that essay examinations have poor reliability as a rule. Discussion and agreement in a meeting of examiners, as to what principles and instructions are to be followed, is a method which tends to minimize unreliability in evaluation of essay-type answer-books. The examination conducted by the Board of Secondary Education is mostly an essay-type examination. Although rules and regulations provide all that is desired, it seems as if the Paper Setters, intentionally or unintentionally, do not want to go against the expectations of the students. Questions are mostly "bookish", as well as "important" or "expected", which produce bad habits among the students such as preparing for only a portion of the course, and that too, just before the examination. Sometimes, when they do not find their expected questions in one of the papers, they

fail in it, which usually amounts to failure in the whole examination, unless they obtain high grades in the other paper of that subject to compensate for it. Studying for only a short time before the examination, cramming on only a small portion of the syllabus, and depending too much on "expected" questions are habits which have become fixed among the students. Most of the teachers also aim to have the maximum number of their students get through, which reflects on their work. That is, it is very difficult for the teachers to have the students memorize the entire syllabus, so the teachers also encourage memorization of a few expected questions. Whenever the question papers do not carry the expected questions, the teachers join with the students in making a great hue and cry.

CHAPTER V

STATISTICAL ANALYSIS OF THE QUESTIONNAIRES

Questionnaires for Professors

One hundred and twenty-five questionnaires were sent to lecturers and professors in the subjects of English, Physics, Chemistry, Biology and Mathematics, in 25 different colleges scattered all over West Pakistan. Five questionnaires were sent to each college, one for each subject. The distribution of the colleges is shown in Table VIII.[1]

TABLE VIII

DISTRIBUTION OF COLLEGES
TO WHICH QUESTIONNAIRES WERE SENT

	Within Lahore	Outside Lahore	Totals
Women's Colleges	3	6	9
Men's Colleges	5	11	16
Totals	8	17	25

[1] The list of these 25 colleges is given in Appendix A.

All 25 colleges are affiliated to the Board of Secondary Education for the F.Sc. Examination.

Very few colleges in West Pakistan have coeducation at the Intermediate level. Women's colleges are staffed either by women lecturers or by older men lecturers. Due to the shortage of women lecturers, especially in science subjects, men lecturers are appointed temporarily, and are replaced as soon as the Department of Education gets women lecturers. Higher education among women is not very popular at present, but the opening of new women's colleges in different cities is an encouragement to them. The number of colleges and the enrolments as they stood on 31st March, 1957, is given in Table IX for the Lahore Region, which includes most but not all of the colleges affiliated to the Board of Secondary Education, Lahore.

TABLE IX

SHOWING THE COLLEGES OF LAHORE REGION AND

THEIR ENROLMENT AS IT STOOD ON 31ST OF MARCH, 1957[2]

	Number of colleges	Number of students			Average No. of students in one college
		Males	Females	Total	
Women's Colleges[3]	10	0	3,425	3,425	342
Men's Colleges[3]	23	19,157	247	19,404	844

[2]The West Pakistan Bureau of Education, Educational Statistics For West Pakistan, 1956-57, (Lahore, 1959).

[3]These colleges include all the (arts and science) colleges in the Lahore Region, private as well as government. Some colleges have only Intermediate classes while others have degree classes as well. Some of these colleges are only arts colleges and do not have any arrangement for F.Sc. classes.

The "questionnaires for professors" were returned from 10 colleges,[4] but some colleges did not return all five questionnaires, as shown in Table X.

TABLE X

NUMBER AND PERCENTAGE OF QUESTIONNAIRES RETURNED

Questionnaires from	Within Lahore			Outside Lahore			Total		
	Sent	Returned	Percentage	Sent	Returned	Percentage	Sent	Returned	Percentage
Women's Colleges	15	2	13	30	12	40	45	14	31
Men's Colleges	25	10	40	55	16	29	80	26	33
Totals	40	12	30	85	28	33	125	40	32

Questions No. 1 and 2 ask for routine information on the sex and official designation of the respondent, etc.

Question No. 3 was designed to know the qualifications and experience of the respondents. The qualifications are as follows:

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[4]The names of these colleges are given in Appendix B.

Holding M.A. Degree	10 lecturers
Holding M.Sc. Degree	19 lecturers
Holding M.Sc. Hons. Degree	6 lecturers
Holding M.A. Hons. (Edinburgh) Degree	1 lecturer
Holding M.S. (Minnesota) Degree	1 lecturer
Holding M.Sc. (London) Degree	1 lecturer
Holding B.Sc. (London) Degree	1 lecturer
Holding B.A. Hons. (London) Degree	1 lecturer
Total:	40 lecturers

This shows that 38 lecturers out of 40 possess at least a Master's Degree, while the remaining two possess B.Sc. and B.A. Hons. Degrees from London University. These degrees are regarded as equivalent to the Master's Degree from any Pakistani University. It is interesting to note that only two of them reported possessing a teaching degree (B.T.). However, most of the college lecturers, even if they possess a teaching degree, prefer not to mention it because it is felt that admitting to the possession of a teaching degree degrades them to the level of a school teacher.

Conclusion. The teaching staff is well qualified in their fields but a significant majority[5] of them did not report the possession of a teaching degree.

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[5]The significance is calculated at the .01 level. Statistical significance at the .01 level means that chance sampling factors would not have produced this disproportion except in one out of 100 similar measurements.

Table XI shows the number of years of teaching experience of the 40 lecturers.

TABLE XI

NUMBER OF LECTURERS ACCORDING TO NUMBER OF YEARS OF TEACHING EXPERIENCE IN F.SC. CLASSES

Number of years	Number of lecturers	
20-21	4	
18-19	0	
16-17	1	
14-15	3	
12-13	2	
10-11	1	Mean = 7.5 years
8-9	3	
6-7	7	
4-5	4	
2-3	9	
0-1	5	
	39	
No response	1	
Total:	40	

This shows that the respondents represent experienced as well as inexperienced lecturers. The minimum and maximum experience among the respondents was $\frac{1}{2}$ year and 21 years respectively.

Question No. 4 asks the names of the colleges where the respondents are teaching. These are given in Appendix B.

Question No. 5 asks for the average number of students in each lecturer's class. The following frequency table shows the distribution of lecturers according to the average number of students reported to be in the class.

TABLE XII

NUMBERS OF STUDENTS IN THE CLASSES OF 40 LECTURERS

Reported Average Number of Students in a class	Number of Lecturers					
	Women's colleges		Men's colleges		Combined	
150-159	1		0		1	
140-149	0		0		0	
130-139	0		0		0	
120-129	0		0		0	
110-119	0		0		0	
100-109	1		0		1	
90-99	0		0		0	
80-89	0		6		6	
70-79	0		1		1	
60-69	0		5		5	
50-59	0		7	(Mdn.)	7	(Mdn.)
40-49	1		3		4	
30-39	5	(Mdn.)	1		6	
20-29	1		1		2	
10-19	4		1		5	
0-9	1		0		1	
	14		25		39	
No response					1	
					40	

Mean for men's colleges = 59.7 students.

Mean for women's colleges = 40.2 students.

Mean for combined colleges = 52.7 students.

Conclusion. The reported number of students in the classes of lecturers of men's colleges is 59.7 students while for lecturers in women's colleges is 40.2 students. The mean of the distribution shows that 53 students is the average number of reported students in the class with a minimum of 4 and maximum 150 students. Clearly it is difficult for a lecturer to give individual attention to all the students in a period of 40 minutes or so.

Question No. 6. ABOUT WHAT PERCENT OF YOUR STUDENTS FALL IN EACH OF THE FOLLOWING CATEGORIES?

a. VERY INTERESTED

b. INTERESTED

c. SOMEWHAT INTERESTED

d. NOT INTERESTED AT ALL

The average percentage of students reported in each of the categories are as follows:

Very interested = 23 per cent, with a minimum of 0 and maximum of 100.

Interested = 34 per cent, with a minimum of 0 and maximum of 80.

Somewhat interested = 21 per cent, with a minimum of 0 and maximum of 56.

Not interested at all = 22 per cent, with a minimum of 0 and maximum of 85.

Total: 100 per cent

Conclusion. If "Very interested" and "Interested" are grouped as interested and "Somewhat interested" and "Not interested at all" as uninterested, then the data shows that in the sample under consideration

57 per cent students of the class are reported to be interested in the subject while 43 per cent are not interested. However, it is feared that sometimes lecturers are inclined to report inflated percentages of interested students because this will reflect their good teaching methods.

Question No. 7. WHAT DO YOU BELIEVE TO BE SOME IMPORTANT REASONS FOR THE LACK OF INTEREST WHICH SOME STUDENTS SHOW?

The free responses to this question varied in nature. However, they may be grouped under the following 16 headings:

	Number of Respondents
1. The students do not have choice for the selection of courses.	12
2. The students have poor English.	11
3. The students are lazy, careless, and non-serious.	10
4. The students have poor background and poor schooling.	9
5. The courses are abstract and are not applied to practical life situations.	7
6. There is no reasonable motivation for the students.	6
7. The students are involved in financial problems and family worries.	5
8. The students remain busy in social activities.	4
9. The colleges do not have sufficient scientific equipment for proper motivation.	4
10. The lecture method does not involve the responsibility of checking the work of students.	2
11. There is a lack of good books.	2
12. There are too many students in one class.	1

	Number of Respondents
13. There are too few future prospects.	1
14. The system of examination is not good.	1
15. The students are emotionally disturbed because of sexual dissatisfaction.	1
16. The students do not find good atmosphere for study.	1
	77

Analysis: The average number of response by each lecturer was 1.9 reasons, with a minimum of 1 and maximum of 4 reasons. Thirty per cent of the respondents reported that one of the reasons why some students lack interest is that they have nothing to say about the choice of their subjects. Under the existing arrangement, the program for F.Sc. is almost entirely fixed. Every student has to take these subjects. Sometimes they elect this program only because their fathers want them to be doctors or engineers. It is difficult for students to keep up an interest in subjects which they do not want to study seriously.

Poor English and poor prior schooling are other reasons for the lack of interest among some students, as pointed out by 27.5 and 22.5 per cent of the respondents respectively. This is because first, the students are not familiar with lectures in English and with English terms; secondly they do not have basic knowledge and usually pass the Matriculation examination by cramming important questions.

Twenty-five per cent of the respondents regarded carelessness and non-seriousness as causes for the lack of interest among some students. This may be due to the lack of proper training, lack of a good education

during early years, and bad study habits.

There are 17.5 per cent of the lecturers who consider that abstractness of courses is a reason for the lack of interest among the students. The syllabus does not deal with practical problems; theory and principles are heavily emphasized.

Ten per cent of the professors have claimed that the shortage of scientific equipment is the cause for the lack of interest among the students. Equipment shortages are especially severe in most of the women's colleges. This is true, because some of them are newly opened[6], and secondly because there is a shortage of women lecturers in science subjects, and the men lecturers who are appointed against these vacancies realize that their appointments are temporary, and thus do not take an interest in building up a good laboratory. To a very great extent, the principals of women colleges are responsible for this state of affairs, because, if they are at all interested in building up a good laboratory, they can remedy this.

Question No. 8. IN YOUR OPINION WHAT ARE THE MAIN DIFFICULTIES FACED BY STUDENTS? PLEASE PUT CHECK MARK (✓) AGAINST THOSE YOU THINK PROPER.

____a. POOR ENGLISH.

____b. CHANGE IN THE LANGUAGE USED AS THE MEDIUM OF INSTRUCTION, FROM URDU TO ENGLISH.

____c. PROBLEMS OF ADJUSTMENTS FROM SCHOOL TO COLLEGE LIFE, DUE TO DIFFERENT METHODS OF TEACHING.

____d. ANY OTHER DIFFICULTY (PLEASE STATE):

_____

[6] In Pakistan, laboratories in newly opened colleges are equipped only gradually.

TABLE XIII

RESPONSES OF 40 LECTURERS TO QUESTION NO. 8 ABOVE

	Number of lecturers	Percentage of lecturers	Significant at the .05 level?
Choosing (a)	37	92	Yes
Choosing (b)	36	90	Yes
Choosing (c)	21	52	No

Other difficulties pointed out by some of the respondents may be grouped under the following titles:

	Number of lecturers
1. Financial difficulties faced by students.	6
2. Poor social set up and environments.	2
3. Too many students in one class and resulting lack of individual attention by the lecturer.	2
4. Lack of good books.	1
5. Poor background preparation.	1
6. Unconditional scholarships.[7]	1

[7] In some of the under-developed parts of West Pakistan, most of the students are awarded scholarships by the government, simply to encourage the local people in college study. Some students get admission to college only to get the scholarship, and are not serious about their studies.

Conclusion. There is no significant difference in the opinions of the lecturers from women's or men's colleges. The overwhelming majority of lecturers from both women's and men's colleges, agree that "Poor English" and "Change in the language used as the medium of instruction, from Urdu to English" are among the difficulties faced by students. The results are statistically significant at the .01 level.

Fifty-two per cent of the respondents regarded "Problems of adjustments from school to college life, due to different methods of teaching" as one of the difficulties faced by students. The chi-square test[8] applied to lecturers of women's colleges and men's colleges also gives a non-significant result. This means that lecturers in women's colleges are no more likely than lecturers in men's colleges to regard this factor as one of the difficulties faced by students.

Question No. 9. ABOUT HOW MANY HOURS, APART FROM THE LECTURE HOUR, DO YOU DEVOTE TO HELP THOSE WHO HAVE DIFFICULTIES WITH THEIR STUDIES?

a. ABOUT _____ HOURS WEEKLY.

b. ABOUT _____ HOURS MONTHLY.

The responses are given in Table XIV.

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[8]The Chi-square test is a statistical method of testing the significance of disproportions and purports to check if chance sampling factors could have produced these results in the absence of a real population disproportion.

TABLE XIV

THE NUMBER OF HOURS WEEKLY DEVOTED TO HELPING STUDENTS AS REPORTED BY 40 LECTURERS

Hours	Women's colleges lecturers	Men's colleges lecturers	Combined colleges lecturers
13-14	1	0	1
11-12	0	3	3
9-10	0	0	0
7-8	2	3	5
5-6	1	4	5
3-4	2	4	6
1-2	4	4	8
0	4	8	12
	14	26	40

Mean for women's colleges lecturers = 3.4 hours per week.

Mean for men's colleges lecturers = 3.8 hours per week.

Mean for all the lecturers = 3.6 hours per week.

Conclusion. The average number of hours devoted by lecturers to extra-class help for students is nearly 3.6 hours per week. Under the present regulations, no lecturer is expected to have office hours, so this result appears generous. Lecturers, however, unofficially

announce in the classes that they are free during such and such times of the week and those who want to contact them may see them in their offices. There are, however, a few lecturers who encourage their students to come at any time they find them free.

Question No. 10. PLEASE GIVE THE APPROXIMATE PERCENTAGE OF YOUR STUDENTS TO WHOM YOU FIND IT PRACTICAL TO GIVE INDIVIDUAL ATTENTION DURING ONE LECTURE HOUR _____.

In question number 5, the average number of students in the class was asked for, and with the help of the responses in question number 10, the approximate number of students who could be given individual attention during the lecture hour was calculated.

TABLE XV

TABLE SHOWING THE APPROXIMATE NUMBER OF STUDENTS WHO COULD BE GIVEN INDIVIDUAL ATTENTION DURING THE LECTURE HOUR BY 40 LECTURERS

Number of students	Number of lecturers	
50-54	1	
45-49	0	
40-44	1	
35-39	0	
30-34	2	
25-29	1	Mean = 12 students
20-24	4	
15-19	3	
10-14	5	
5-9	5	
0-4	15	
	37	
No response	3	
	40	

Conclusion. The average number of students who can be given individual attention during the lecture hour is calculated as 12, which suggests that for good teaching the class should not exceed 12 students.

However, it is believed that the conscious application of techniques to motivate students can enable a teacher to give individual attention to upwards of 20 students. This suggests that the lecturers either do not know these methods or do not apply them.

Question No. 11. WHAT ARE THE MAIN REASONS MAKING IT IMPRACTICAL TO GIVE INDIVIDUAL ATTENTION TO ALL THE STUDENTS?

____a. PERSONAL LIKING FOR THE LECTURE METHOD.

____b. TOO MANY STUDENTS IN THE CLASS.

____c. RESPONSIBILITY TO COVER THE HEAVY SYLLABUS.

____d. LACK OF INTEREST AMONG THE STUDENTS.

____e. LACK OF EQUIPMENT FOR DEMONSTRATION.

____f. OTHERS, IF ANY:_____

The responses are given in Table XVI.

TABLE XVI

STATEMENT SHOWING THE REASONS WHICH MAKE IT IMPRACTICAL TO GIVE INDIVIDUAL ATTENTION TO ALL THE STUDENTS

In favour of	Number of lecturers in women's colleges	Number of lecturers in men's colleges	Total number of lecturers
Reason (a)	1	0	1
Reason (b)	6	22	28
Reason (c)	13	20	33
Reason (d)	3	4	7
Reason (e)	4	9	13

Number of lecturers in women's colleges	= 14
Number of lecturers in men's colleges	= 26
Number of total lecturers	= 40

Analysis. According to the lecturers of men's colleges, the main reasons which make it impractical to give individual attention to all the students are as follows:

1. Too many students in the class; and
2. Responsibility to cover the heavy syllabus.

The result is significant at the .05 level when the number choosing each response is compared with the number not choosing it. (Binomial Test).

Moreover, they believe that the following are not among the main reasons debarring individual attention to all students:

1. Personal liking for the lecture method; and

2. Lack of interest among the students.

The result is again significant at the .05 level when the number choosing each response is compared with the number not choosing it (Binomial Test).

The main reason which makes it impractical to give individual attention to all the students, according to lecturers of women's colleges, is the "Responsibility to cover the heavy syllabus". The result is significant at the .05 level when the number choosing the response is compared with the number not choosing it. (Binomial Test).

Moreover, they believe that "Personal liking for the lecture method" is not a main reason for it. The result is again significant at the .05 level when the number choosing the response is compared with the number not choosing it. (Binomial Test).

When all responses are taken together, the main reasons which are reported as making it impractical to give individual attention to all the students are as follows:

1. Too many students in the class; and

2. Responsibility to cover the heavy syllabus.

The results are significant at the .05 level when the number choosing each response is compared with the number not choosing it. (Binomial Test).

Moreover, a significant majority of the lecturers of both men's and women's colleges believe that the following are not among the main reasons depriving the students of individual attention:

1. Personal liking for the lecture method;

2. Lack of interest among the students; and

3. Lack of equipment for demonstration.

The results are significant at the .05 level when the number choosing each response is compared with the number not choosing it. (Binomial Test).

"Too many students in the class" is regarded as one of the main reasons by 85 per cent of the lecturers from men's colleges, and by 43 per cent of the lecturers from women's colleges. The chi-square test results in significance at the .01 level, in the direction which shows that a significantly greater proportion of lecturers from men's colleges believe that "Too many students in the class" is one of the main reasons. This is probably because in most of the women's colleges, the number of students in one class is smaller, and so the lecturers of women colleges usually do not face this difficulty.

Question No. 12. WHO HAS PRESCRIBED THE TEXT BOOK?

____a. YOURSELF.

____b. THE HEAD OF YOUR DEPARTMENT.

____c. THE PRINCIPAL.

____d. THE BOARD OF SECONDARY EDUCATION.

Only text books for the subject of English are prescribed by the Board of Secondary Education, Lahore, while for Mathematics, Physics, Chemistry and Biology, outlines of syllabi and courses are determined by the Board and the choice of the book is left to the lecturer or the head of the department of the subject in the college. Usually the lecturers and the heads of the departments jointly decide which book

should be prescribed. Under these circumstances, the lecturers have considerable responsibility in the selection of books to be used.

Question No. 13. WHAT IS YOUR OPINION ABOUT THE TEXT BOOK? PLEASE CHECK ONE.

____a. VERY GOOD.

____b. GOOD.

____c. MODERATELY GOOD.

____d. SOMEWHAT POOR.

____e. VERY POOR.

The responses are given in Table XVII

TABLE XVII

OPINIONS OF 40 LECTURERS

ABOUT THE FITNESS OF THE TEXT BOOKS

	"GOOD"			"POOR"			
	Very good	Good	Mod. good	Somewhat poor	Very poor	"GOOD"	"POOR"
English	1	2	3	0	1	6	1
Physics	4	1	2	0	0	7	0
Chemistry	2	5	3	1	1	10	2
Biology	1	3	5	0	0	9	0
Mathematics	1	3	1	0	0	5	0
						37	3

Conclusion. A significant majority[9] of lecturers consider that the text books which they use are good. This is to be expected because in most of the cases the books are selected by themselves.

Question No. 13. WHAT IS YOUR OPINION ABOUT THE PRESCRIBED CURRICULUM?

____a. EXCELLENT.

____b. GOOD.

____c. SATISFACTORY.

____d. SOMEWHAT POOR.

____e. POOR.

____f. VERY POOR.

TABLE XVIII

OPINIONS OF 40 LECTURERS ABOUT THE FITNESS OF THE CURRICULUM

Subjects	(a)	(b)	(c)	(d)	(e)	(f)
English	0	1	5	0	0	1
Physics	0	1	5	1	0	0
Chemistry	0	2	8	1	1	0
Biology	0	2	5	2	0	0
Mathematics	0	1	3	1	0	0
	0	7	26	5	1	1

[9] At the .05 level.

If "excellent" and "good" stand for "curriculum almost free from defects", "satisfactory" and "somewhat poor" for "curriculum needs improvement" and "poor" and "very poor" for "curriculum needs radical change", then the responses can be grouped as follows:

Curriculum almost free from defects	7
Curriculum needs improvement	31
Curriculum needs radical change	2
	40

The chi-square test of the hypothesis that the population has equal proportions under each category yields a value of 36.06 and is significant at the .01 level. This means that chance can produce such a disproportionate grouping less than once in 100 times. It is therefore concluded that a significant majority of lecturers believe that the curriculum needs improvement. This is especially justifiable since those who chose "satisfactory" did so in a list which included "good" and "excellent".

Question No. 16. WHAT MAJOR MODIFICATIONS WOULD YOU SUGGEST IN THE CURRICULUM?

The freely offered suggestions and modifications may be grouped under the following main headings:

Suggested Curriculum Modifications

ENGLISH

Number of lecturers = 7	Number of lecturers mentioning
1. More emphasis on good composition.	3
2. More emphasis should be given on general English and number of text books should be decreased.	3

	Number of lecturers mentioning
3. More emphasis on developing intelligent comprehension.	2
4. Text books should be interesting.	1
5. Text books should not be very difficult.	1
6. No response.	1
	11

Average number of responses = 1.6
(with a maximum of 3)

Suggested Curriculum Modifications

PHYSICS

Number of lecturers = 7

1. Part of the present syllabus should be taught in the Matriculation.	2
2. Separate courses for pre-medical students and pre-engineering students.	2
3. Applications to everyday life situations should be emphasized.	1
4. There should be no change.	1
5. A portion of classical Physics may be replaced by the modern Physics.	1
6. Mathematical portion should be added for pre-medical students.[10]	1
7. No response	2
	10

Average number of response = 1.4
(with a maximum of 4)

---

[10]Pre-medical students are not required to study Mathematics as a subject, and their backgrounds in Mathematics is not adequate for Intermediate Physics. Physics lecturers usually teach some fundamentals about Trigonometry, Algebra and Calculus.

Suggested Curriculum Modifications

CHEMISTRY

Number of lecturers = 12

	Number of lecturers mentioning
1. Emphasis should be given on practical application.	6
2. The course should be decreased.	3
3. Syllabus should be different for pre-medical and pre-engineering classes.	2
4. Modern aspects of the subject should be included	2
	13

Average number of response = 1.1
(with a maximum of 2)

Suggested Curriculum Modifications

BIOLOGY

Number of lecturers = 9

1. Emphasis should be given on understanding the principles and their applications.	2
2. Descriptive portion should be decreased.	2
3. More emphasis on practical work.	1
4. Modern up-to-date knowledge should be included.	1
5. No response.	4
	10

Average number of response is 1.1
(with a maximum of 3)

Suggested Curriculum Modifications

MATHEMATICS

Number of lecturers = 5

1. Stress should be laid on practical side.	1

	Number of lecturers mentioning
2. Part of the present courses should be taught in Matriculation stage, while new portion of Dynamics and Statics should be added.	1
3. No response.	3
	5

Out of 5 lecturers, only 2 responded. Each gave one suggestion.

No attempts are made to assess the statistical significance of these statements as the number of respondents is too small to be dealt with statistically. More or less, these are the individual opinions of these lecturers in their fields, but it is notable that in almost all of the subjects, most of the lecturers have reported the necessity of giving emphasis to practical applications of principles in everyday life situations. It is also frequently urged that modern aspects of the subjects be introduced.

Question No. 17 is believed to have been interpreted differently by different lecturers; it has been dropped as essentially defective.

Question No. 18. DO YOU COMBINE THE DEMONSTRATION METHOD WITH THE LECTURE METHOD?

____a. NEVER.

____b. SELDOM.

____c. SOMETIMES.

____d. ALWAYS.

The following are the responses of 28 science lecturers[11] and professors about the combination of the demonstration method with the lecture method:

---

[11]Seven English lecturers and 5 Mathematics lecturers did not respond to this question because they do not demonstrate anything during the lecture hour.

Never	2 lecturers
Seldom	0 lecturers
Sometimes	16 lecturers
Always	10 lecturers
	28

Never and seldom = 2 + 0 = 2

Sometimes and always = 16 +10 = 26.

Conclusion. If "never" and "seldom" may be interpreted as the non-use of demonstration method while "sometimes" and "always" as the use of demonstration method, then a significant[12] majority of lecturers do combine the demonstration method with the lecture method. This may be because demonstration of experiments by lecturers needs less time, less equipment and less expenditure.

Question No. 19. WHAT TYPES OF QUESTIONS DO YOU SET IN THE EXAMINATIONS?

____a. PROBLEM-QUESTION TYPE.

____b. YES-NO OR MULTIPLE CHOICE OBJECTIVE QUESTIONS.

____c. A COMBINATION OF THE TWO (a and b).

____d. ORAL EXAMINATION. (INTERVIEW METHOD).

____e. OTHERS (PLEASE STATE):_____

The responses are as follows:

---

[12]At the .01 level.

	Number of lecturers	Percentage of lecturers
Problem-question type alone.	25	62
Yes-No, or multiple choice objective questions.	0	0
A combination of the two (a and b).	3	8
Oral examination alone.	0	0
Problem-question type with added oral examination.	12	30
	40	100

Conclusion. The data on record, as reported by 40 lecturers, show that objective questions are not often set in the examinations. The most popular type of question is the problem-question type. In sciences, oral examination also forms a part of the total examination of the candidate.

Question No. 20. WHICH ONE OF THE ABOVE TYPES DO YOU THINK IS THE MOST USEFUL? AND WHY? _____

The responses are as follows:

	Number of lecturers
1. Problem-question type.	20
2. Combination of problem-question type and objective questions.	10
3. Combination of problem-question type and oral examination.	5
4. Combination of problem-question type, objective questions and oral examination.	1
5. No response.	4
	40

Analysis. Chi-square is calculated which is significant at the .01 level. This shows that chance can produce such a distribution less than one time in 100, and that the lecturers are significantly biased in favour of the problem-question type of examination at present. The combination of problem-type and objective questions is recommended by only 25 per cent. It seems as if many of the lecturers are not familiar with objective type questions. It is just possible that some of them have never seen or heard of such questions. Under these circumstances, it is difficult to rely on their responses about objective type questions.

To sum up the results, the following are the important conclusions derived from the responses of 40 lecturers:

1. The average number of students in one class is reported as 53.

2. 57.1 per cent of the students in the classes are reported as interested while the rest are reported as not interested in the subject matter.

3. "No choice for the selection of subjects", "poor English", "non-seriousness", and "poor schooling" are the main reasons believed to account for the fact that some students do not take an interest in the classroom work.

4. "Lack of scientific equipment" is another cause, mainly in women's colleges, which is believed to make students uninterested in their studies.

5. A significant majority of lecturers, both from women's and men's colleges, agree that "poor English" and "change in the medium of instruction, from Urdu to English" are the main difficulties which are faced by most of the Intermediate students.

6. The average number of hours reserved for extra-class help of students is 3.6 hours per week.

7. The average number of students who can be given individual attention by the lecturers during the lecture hour is 12, according to analysis of the respondents' reports.

8. A significant majority of the lecturers believe that "too many students in the class" and "the responsibility to cover the lengthy syllabus" are the main reasons that make impractical the giving of individual attention to all the students during the lecture hour.

9. A significantly greater proportion of lecturers from men's colleges (as opposed to women's colleges) believe that "too many students in the class" is one of the reasons making it impractical to give individual attention to all the students during the lecture hour.

10. A significant majority of lecturers believe that "personal liking for the lecture method", "lack of interest among the students" and "lack of equipment for demonstrations" are not among the main reasons which deprive the students of individual attention.

11. A significant majority of lecturers believe that the present curriculum needs improvement.

12. A significant majority of lecturers combine the demonstration method with the lecture method.

13. An overwhelming majority of lecturers like to set problem-solving type questions in their examinations.

14. Most of the lecturers believe that more emphasis should be given to practical applications of principles to everyday problem situations.

Questionnaires for Students

Two hundred questionnaires were sent to students in different colleges affiliated with the Board of Secondary Education, Lahore. The questionnaires were meant for those students who failed in the F.Sc. Examination and rejoined the second year class. However, it was requested that one questionnaire in each college should be filled in by a student who had passed the F.Sc. Examination and joined the third year class. Out of 200, only 34 per cent (69 questionnaires) were returned. These represent 11 colleges.[13] The details are as follows:

	Fail Group	Pass Group	Total
Boys	33	7	40
Girls	27	2	29
	60	9	69
Pre-medical Group			
Boys	16	5	21
Girls	24	2	26
	40	7	47
Pre-engineering Group			
Boys	17	2	19
Girls	3	0	3
	20	2	22

The fail group respondents, according to the division obtained in the Matriculation Examination, are placed as follows:

[13]The names of the colleges are given in Appendix B.

	Number of students	Percentage
First Division Matriculates	27	45
Second Division Matriculates	30	50
Third Division Matriculates	3	5
	60	100

It is notable that the majority of failures have had first or second division in the Matriculation Examination. One of the reasons for this is that some colleges admit only a limited number of students in the F.Sc. class and do not admit third division matriculates except in special cases.[14] Also since science courses are considered to be more difficult, the third division matriculates generally join the arts class rather than the F.Sc. class.

Question No. 9. WHY ARE YOU STUDYING (OR DID YOU STUDY) IN F.SC.? PLEASE CHECK ONE.

____a. MY GUARDIANS WISHED SO, ALTHOUGH I AM NOT (OR WAS NOT) INTERESTED AT ALL.

____b. THE F.SC. IS (OR WAS) A PRE-REQUISITE FOR THE PROFESSION I ASPIRE TO, OTHERWISE I WOULD NOT HAVE CHOSEN THESE SUBJECTS.

____c. I AM (OR WAS) SOMEWHAT INTERESTED IN THESE SUBJECTS, APART FROM MY GUARDIAN'S PRESSURE.

____d. I AM (OR WAS) VERY INTERESTED IN THESE SUBJECTS.

____e. SOME OTHER REASONS (PLEASE STATE): _____

[14] Special cases include students who are very prominent in extra-curricular activities and games, etc.

TABLE XIX

SHOWING THE RESPONSES OF 69 STUDENTS

TO QUESTION NO. 9 ABOVE

	Fail Group			Pass Group	Combined Groups
	Boys	Girls	Total	Number of students	Number of students
Favouring (a)	2	0	2	2	4
Favouring (b)	15	8	23	3	26
Favouring (c)	4	8	12	2	14
Favouring (d)	12	11	23	2	25
	33	27	60	9	69

Conclusion. Chi-square was calculated for the distribution of the fail group as well as for the combined groups. In both cases it is significant at the .01 level which means that chance would not have produced such disproportions more than once in 100 times. The data shows that only 36.2 per cent of the students claim to study because they are interested in the subjects; the majority of the rest study F.Sc. subjects because they are pre-requisites for the professions they aspire to.

Question No. 10. THE TIME I HAVE GENERALLY DEVOTED TO STUDY IS AS FOLLOWS:

____HOURS PER DAY DURING THE FIRST HALF OF THE YEAR.

____HOURS PER DAY DURING THE SECOND HALF OF THE YEAR.

____ HOURS PER DAY DURING THE ONE MONTH PRECEDING THE EXAMINATION.

The responses are given in Table XX.

TABLE XX

NUMBER OF HOURS PER DAY REPORTED TO BE DEVOTED TO STUDY BY 69 STUDENTS

No. of hours per day	First half of the year (A)		Second half of the year (B)		One month preceding the examination (C)	
12	0		0		5	
11	0		0		1	
10	0		0		6	
9	0		1		0	
8	4		5		12	
7	2		1		9	
6	1		4		14	Mdn.
5	5		9		8	
4	6		19	Mdn.	8	
3	18	Mdn.	7		6	
2	15		16		0	
1	11		6		0	
0	7		1		0	
	69		69		69	

Analysis and conclusion.

Mean for the first half of the year	= 2.8	hours	A
Standard Deviation for the first half of the year	= 2.04		
Standard Error of the mean for the first half of the year	= .247		
Mean for the second half of the year	= 3.8	hours	B
Standard Deviation for the second half of the year	= 2.00		
Standard Error of the mean for the second half of the year	= .242		
Mean for one month preceding the examination	= 6.3	hours	C
Standard Deviation for one month preceding the examination	= 2.54		
Standard Error of mean for one month preceding the examination	= .308		
Standard Error of a difference between the means of (A) and (B)	= .346		
Critical Ratio between (A) and (B)	= 2.9		

The difference is significant at the .01 level, which shows that such a difference in the mean values can happen by chance less than 1 time in 100. In other words, there is a clear tendency to devote more time to study in the latter half of the year.

Again the Standard Error of a difference between the means of (B) and (C)	= .392
Critical Ratio between (B) and (C)	= 6.4

The difference is significant at the .01 level. In fact, such a difference (or more) in the mean values can occur by chance less than

one time out of 100,000,000. In other words, there is a clear tendency to devote more and more time near the examination.

Question No. 11. DURING MY STUDY IN F.SC. I FELT THE FOLLOWING DIFFICULTIES: (PLEASE CHECK AS MANY AS YOU THINK PROPER)

____a. MY ENGLISH WAS POOR.

____b. I WAS NOT FAMILIAR WITH THE ENGLISH TERMS, AS I WAS TAUGHT IN URDU IN MY PREVIOUS SCHOOL.

____c. HOME WORK WAS NOT ASSIGNED FREQUENTLY, SO THAT I COULD NOT GET PROPER PRACTICE.

____d. I COULD NOT UNDERSTAND MOST OF THE LECTURES (OR PRACTICALS)

____(1) DUE TO A LARGE CLASS OR GROUP OF STUDENTS.

____(2) DUE TO SOME PHYSICAL HANDICAP SUCH AS EYE-SHORT-SIGHTEDNESS, POOR HEARING ETC.

____(3) DUE TO MY POOR HEALTH.

____(4) SOME OTHER REASONS: (PLEASE STATE):_____

____e. THE COURSES WERE TOO LENGTHY AND ABSTRACT.

____f. THERE WAS NO PRACTICAL APPLICATION TO MAKE IT INTERESTING.

____g. I HAD FINANCIAL TROUBLES.

____h. I HAD FAMILY WORRIES.

____i. ANY OTHER DIFFICULTY (PLEASE STATE):_____

The responses are classified in Table XXI.

TABLE XXI

TABLE SHOWING THE DIFFICULTIES

FACED BY 69 STUDENTS DURING THEIR STUDY IN F.SC.

	Fail Group		Pass Group	Combined	Summarized
	Boys	Girls	Number of students	Number of students	Response
(a)	14	17	1	32	Poor English
(b)	25	19	1	45	Unfamiliar with English terms
(c)	27	15	5	47	Home work not given
(d)-1	12	3	3	18	Class too large
(d)-2	2	0	0	2	Physical handicap
(d)-3	3	3	0	6	Health
(e)	25	25	6	56	Courses long and abstract
(f)	13	10	3	26	No practical application
(g)	7	1	2	10	Financial troubles
(h)	9	4	1	14	Family worries

Other difficulties pointed out by some of the students are summarized as follows:

	Number of students
1. Lack of lecturers.	5
2. Too much engagement in social and sports activities.	4
3. Poor teaching methods.	3

	Number of students
4. Poor background knowledge.	3
5. No proper arrangements for practicals.	2
6. Laziness.	2
7. Bad season.	1
8. Accomodation problem in hostels.	1
9. Lack of individual attention.	1
10. Lack of good books.	1
11. Irregular study.	1
12. Conveyance problem.	1

Most of these difficulties are local and personal problems.

Conclusion. There is no significant difference[15] of opinion between the boys and the girls of the fail group. Also no significant difference[15] is found between the opinions of the fail group and the pass group. For the combined group, the binomial test was used for finding significant disproportions in the choices of individual responses. A significant[15] majority of students faced the following difficulties during their study in F.Sc.:

1. "I was not familiar with the English terms, as I was taught in Urdu in my previous school".
2. "Home work was not assigned frequently, so that I could not get proper practice".
3. "The courses were too lengthy and abstract".

It is also interesting to note that a significant majority of students did not feel the following difficulties during their study in F.Sc.:

---

[15] At the .05 level.

1. "I could not understand most of the lectures (or practicals)

   (i) due to a large class or group of students

   (ii) due to some physical handicap such as, eye-short-sightedness, poor hearing etc.

   (iii) due to my poor health."

2. "I had financial troubles."

3. "I had family worries."

Question No. 12. PLEASE CHECK ONE OF THE FOLLOWING:

____a. PRACTICAL HOURS WERE ENJOYED BY ME.

____b. I DID PRACTICALS NOT FOR ENJOYMENT BUT FOR MY CLEAR UNDERSTANDING OF THE TEXT.

____c. I DID PRACTICALS BECAUSE THEY WERE COMPULSORY, ALTHOUGH I WAS NOT INTERESTED.

____d. PRACTICAL HOURS WERE BORING FOR ME, AND I OFTEN DID NOT UNDERSTAND THEM.

TABLE XXII

SHOWING OPINIONS OF 69 STUDENTS ABOUT PRACTICAL HOURS,

ASKED IN QUESTION NO. 12

	Fail Group		Pass Group	Combined
	Number of Boys	Number of Girls	Number of students	Number of students
(a)	5	7	2	14
(b)	17	15	3	35
(c)	3	3	3	9
(d)	8	2	1	11
	33	27	9	69

Conclusion. The chi-square tests show that opinions of boys and girls of the fail group do not differ significantly at the .05 level, and also that pass group and fail group do not differ significantly in expressing their opinions about practical hours. However, for the combined group, the students are significantly biased in their expression of opinions about the practical hours. In particular "I did practicals not for enjoyment but for my clear understanding of the text" is the opinion held by a significantly large proportion of the students. This suggests that practical hours are not made interesting to most of the students. Perhaps this may be because fixed experiments are performed with the help of equipment made by foreign or local firms. The students do not find anything really new and interesting.

Question No. 14. HOW MANY BOOKS, APART FROM YOUR TEXT, HAVE YOU READ ON EACH SUBJECT DURING THE LAST TWO YEARS?

ENGLISH:_____, PHYSICS:_____, CHEMISTRY:_____, BIOLOGY:_____, MATHEMATICS:_____.

The responses are given in Tables XXIII, XXIV, XXV, XXVI and XXVII, respectively.

TABLE XXIII

SHOWING THE NUMBER OF BOOKS IN ENGLISH, APART FROM THE TEXT, READ BY 69 STUDENTS, DURING THE TWO YEARS OF THE F.SC. COURSE

Number of books	Number of students	
10	3	
9	1	
8	2	
7	0	
6	4	Mean = 2.5 books
5	6	
4	5	
3	7	
2	10	
1	2	
0	29	
	69	

Conclusion. On the average each student reports reading 2.5 books in English, apart from the text books, during the two years of study in F.Sc. Nearly 43 per cent did not study even a single book in English outside the text.

TABLE XXIV

SHOWING THE NUMBER OF BOOKS IN PHYSICS,
APART FROM THE TEXT, READ BY 69 STUDENTS,
DURING THE TWO YEARS OF THE F.SC. COURSE

Number of books	Number of students	
6	1	
5	1	
4	3	
3	2	Mean = 1.0 book
2	16	
1	11	
0	35	
	69	

Conclusion. On the average one book in the subject of Physics is reportedly read by each student during his two years, apart from the text books. There are more than half who have not read even a single book on Physics during the two years of the F.Sc. course.

TABLE XXV

SHOWING THE NUMBER OF BOOKS IN CHEMISTRY,
APART FROM THE TEXT, READ BY 69 STUDENTS,
DURING THE TWO YEARS OF THE F.SC. COURSE

Number of books	Number of students	
8	1	
7	1	
6	1	
5	2	
4	1	Mean = 1.0 book
3	2	
2	10	
1	11	
0	40	
	69	

Conclusion. On the average, one book is reportedly read by each student in the subject of Chemistry. The majority did not study even a single book outside the text in this subject.

TABLE XXVI

SHOWING THE NUMBER OF BOOKS IN BIOLOGY,
APART FROM THE TEXT, READ BY 47 STUDENTS,
DURING THE TWO YEARS OF THE F.SC. COURSE

Number of books	Number of students	
7	1	
6	0	
5	0	
4	4	Mean = 1.4 books
3	6	
2	9	
1	5	
0	22	
	47	

Conclusion. 1.4 is the average number of books in Biology, read by each student during the last two years' stay in F.Sc., as reported by themselves. Nearly 47 per cent of the students did not study even a single book outside the text.

TABLE XXVII

SHOWING THE NUMBER OF BOOKS, READ BY 22 STUDENTS OF F.SC. (PRE-ENGINEERING), DURING THE TWO YEARS, IN THE SUBJECT OF MATHEMATICS, APART FROM THE TEXT BOOKS

Number of books	Number of students	
7	1	
6	0	
5	1	
4	1	Mean = 1.3 books
3	2	
2	2	
1	3	
0	12	
	22	

Conclusion. 1.3 books is the average number of books in Mathematics read by each student as an outside reading, as reported by 22 students. More than half of the students did not study even a single book outside the text.

No efforts are made to find out the significance of the difference in reading books between boys and girls or between fail group and pass group. Also no comparison is made to see in which subject more books are read by the students. The general conclusion is that students hardly ever go beyond their text books at all. This is also because no outside

readings are given by the lecturers and the questions in the examination require reproduction of what is included in the text books, and of nothing else.

Question No. 15. IF YOU FAILED IN THE F.SC., WHAT DO YOU THINK ARE THE MAIN REASONS?

Each student was supposed to give reasons which were true in his particular case. The freely offered responses are summed up under the following headings:

	Number of students
1. Irregular study habits.	19
2. Courses were too lengthy to cover.	9
3. Shortage of lecturers.	9
4. Personal sickness and poor-health.	8
5. Lack of practical equipment in the laboratory.	6
6. Teaching methods were poor.	6
7. Family worries.	5
8. Bad company.	5
9. Poor English.	3
10. Change in the medium of instruction.	3
11. Took very active part in social activities or games.	2
12. Bad hand-writing.	2
13. Personal financial problems.	2
14. Examination system is not good.	2
15. Afraid of third division.	2
16. Co-education distracted attention from studies.	2
17. Personal laziness.	1

	Number of students
18. Too much talk about opposite sex.	1
19. Too much on personal show and make up.	1
20. Bad luck.	1
21. Too much crowding in the college hostel.	1
22. Too many students in the class.	1
23. No checking from the lecturers.	1
24. No check and control from the parents.	1
25. No response.	8
	101

Average number of responses is 1.6,
(with a maximum of 5).

Conclusion. It is interesting to note that 32 per cent of these 60 students in the fail group realized that one of the reasons for their failure in the examination was their irregular study. They seemed to feel that if they had worked regularly from the beginning, they might have passed. It seems that the present system of teaching does not require the students to study regularly.

Fifteen per cent of the students felt that lengthy courses were among the reasons for their failure. Perhaps they felt the courses to be too long because it became difficult for them to cover all of them just before the examination.

There were 15 per cent of the students who complained that shortage of lecturers was one of the reasons of their failure in the examination. This is true especially in women's colleges, where women lecturers in sciences are not available. Moreover, substitutes are

usually not provided immediately in cases of long leaves or transfers. It is not unusual to find that a substitute is provided only after several months, during which classes suffer.

Question No. 16. IF YOU PASSED THE F.SC. EXAMINATION, PLEASE GIVE YOUR OPINION AS TO THE REASONS FOR THE FAILURES OF SO MANY STUDENTS:

The opinions of 9 students who passed the F.Sc. Examination, may be grouped as follows:

	Number of students
1. Irregular study habits.	4
2. Took very active part in social activities or games.	2
3. Change of the language in the medium of instruction.	2
4. Bad teaching methods.	2
5. Bad company of friends.	2
6. Shortage of lecturers.	1
7. Poor English.	1
8. Too much crowding in the college hostel.	1
9. Bad luck.	1
10. No checking from the lecturers.	1
11. Poor schooling and background.	1
12. No check and control from the parents.	1
	19

Average number of response is 2.1,
(with a maximum of 3).

Conclusion. Forty-four per cent of the students in the pass group are also of the opinion that most of the students failed because

they did not study regularly. A good percentage of them regard "social engagement", "change of language in the medium of instruction", "poor teaching methods" and "bad company of friends" as the other possible reasons for so many failures in the F.Sc. Examination.

To sum up, some of the important conclusions are as follows:

1. Nearly 36 per cent of the students report that they study because they are interested, while the majority of the rest say that they have to study because it is a pre-requisite for the profession they aspire to.

2. Students study a significantly greater number of hours per day near the examination.

3. A significant majority of students reported that they faced the following difficulties during their study in F.Sc.:

(i) "I was not familiar with the English terms, as I was taught in Urdu in my previous school".

(ii) "Home work was not assigned frequently, so that I could not get proper practice".

(iii) "The courses were too lengthy and abstract".

4. A significant majority of the students <u>did not</u> feel the following difficulties during this period:

(i) "I could not understand most of the lectures (or practicals),

a. due to a large class or group of students.

b. due to some physical handicap such as, short-sightedness, poor hearing etc.

c. due to my poor health".

(ii) "I had financial troubles".

(iii) "I had family worries".

5. "I did practicals not for enjoyment but for my clear understanding of the text" is the opinion held by a significant majority of the students.

6. Students, on the average, do not read more than 1 or 2 books in each subject during the two years, apart from the text books.

7. According to most of the 60 students in the fail group, "irregular study", "lengthy courses", and "shortage of lecturers" are among the main reasons responsible for their failure.

8. According to most of the students in the pass group, "irregular study" and "social activities" are the most probable causes of failure of so many students in the F.Sc. Examination.

CHAPTER VI

RECOMMENDATIONS

Recommendations for the Medium of Instruction

It has been realized that the medium of instruction presents some of the most difficult problems for the present educationists of Pakistan. It is an important factor in lowering the educational standards and achievements. The only possible solution seems to be a compromise between the two widely opposed groups, namely one demanding immediate change-over to Urdu in all fields and the other in favour of retention of English as the medium of instruction.

It is very important that Urdu as a language should be developed. The development of a language is essential for the maintenance and development of a unique cultural heritage. How long can the people of Pakistan use English as the official language? How long will most of the students continue to fail in the examination as a direct result of poor English? All this needs careful consideration, but it does not mean that Urdu should immediately take over the place of English. As discussed in Chapter II, this would result in complete chaos and would block further study and research. On the other hand, it appears advisable to work for this change over a period of years. Although the transitional period will be hard, it is unavoidable.

Some of the ways in which this gradual change-over in the medium of instruction can take place may be as follows:

1. Lectures may be given in Urdu in the Intermediate classes but technical terms in English may be used and written for the time being.

2. An Official Language Committee was formed nearly 10 years ago to translate official terms, technical terms and phrases of common usage. Apart from the translation of Central Acts, rules and regulations etc., the Committee has "published standardised translations of about 22,000 terms and phrases commonly used in official notings and correspondence. Translations of another 21,000 terms have been prepared and will be published after revision and standardisation."[1] The Committee should revise the translation of scientific and technical terms. They should either replace them by easy Urdu words or coin new words in Urdu for these terms after modifications needed to make them easily written and read in Urdu script. This will help the students to recognize these terms in English texts. The practice of changing English terms into Arabic or Persian terms does not appear to be a proper solution.

3. Dictionaries of technical terms, from English to Urdu and Urdu to English should be compiled.

4. Books should be written in Urdu. Literal translations of English books should not be used as text books. Educators may be encouraged to write books in Urdu, and it is not impossible for the country to be self-sufficient in text books within a short period of time.

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[1]Editorial, The Pakistan Times, Lahore, December 11, 1959, p.4B.

5. English should continue to have the status of a compulsory subject. Since most of the students who fail in the examination fail due to their failure in English,[2] it is recommended that English be declared an Additional Compulsory subject, with the condition that failure in English does not mean automatic failure in the examination, but that no English marks will be added in forming the aggregate to determine the division. This will result in a very poor division (and in some cases failure in the examination) for all those who fail in English. At the same time this will not belittle the importance of English in any way, because the possible loss of at least 66 marks[3] will be a powerful incentive to gain more than 66 in English. Those who do not do so will require unusually high grades in their remaining subjects in order to pass the examination. However, more curricular and examination emphasis should be given to correct understanding and writing simple English, and less to English literature, which is much stressed at present.[4]

6. Bengali in West Pakistan, and Urdu in East Pakistan should be made compulsory during the first three years of high school. It is felt that this will prove very helpful in promoting brotherly feelings, unity and love between the people of the two wings of Pakistan. This will also facilitate the adoption of both Urdu and Bengali as the official languages of Pakistan in the long run. The problem of supplying enough

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[2]Because failure in English is usually an automatic failure for the whole examination.

[3]The minimum number of marks for passing in English is 33 per cent of 200 marks, or 66 marks.

[4]At present in the F.Sc. Examination, out of 200 marks for English, 145 are given for literature and only 55 for grammar and composition.

teachers of the other language can be met by inter-wing transfers of teachers, with generous additional allowances.

7. To remain in touch with the latest developments in different fields, pupils may be encouraged through assignments to read books and magazines in English, especially during the period before such materials are available in Urdu or Bengali.

8. During the transitional period, in B.Sc. and higher education, the lectures may be given in Urdu, while nonexistent Urdu terms may be given in the English language. Standardized Urdu words may be expected to replace them in the course of time.

Recommendations for the Methods of Teaching

It has been demonstrated that the present methods of teaching in the colleges are not adequate and suitable. Some of the defects pointed out in chapter III are as follows:

1. The methods used expect almost no activity on the parts of students.

2. Cramming is encouraged.

3. Independent thinking and planning are discouraged.

4. Habits of reading outside books, journals and periodicals, are not encouraged.

5. Theoretical aspects of knowledge are emphasized and no attention is given to showing the relationship of this knowledge to actual life problems. This is done on the supposition that transfer of training is automatic, regardless of the lack of similarity between the theoretical and the real.

6. An authoritarian outlook is promoted. The pupils are led to believe without question what their professor and their text book say,

because by this means they can be assured of success in the examination.

7. The present methods try to pour knowledge into students' minds. The pupils are not encouraged to search for the solutions to problems independently. They find great difficulties when they have to face real problems in everyday life situations, because they are not trained for it.

8. Widely accepted principles of learning, interest and motivation are not made use of.

It is therefore recommended that efforts be made to adopt new methods of teaching. These should be consonant with the present culture and set of values. Such methods may minimize the existing defects.

The experiments of Thorndike and other modern psychologists have shown that:

1. An individual learns best those things in which he has an interest.

2. Learning is specific. We learn what we do.

3. Transfer of learning[5] takes place when there is similarity between two situations.

4. Transfer of learning from one situation to another is automatic only to a very limited degree.

The first principle demands that the present methods of teaching should be modified so as to create interest among the students. The

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[5]If the knowledge, skills, attitudes, and principles learned in context in one situation, are carried over and applied in another situation (new situation), then it is said that the transfer of learning has taken place.

curriculum should not be abstract; it should be more practical. The text books should be made interesting and events and problems should be taken from real life situations. As far as possible, audio-visual aids should supplement teaching. Commenting about abstrast and rigid subject matter, Dewey writes:

> . . . it can be truly said that abstractness is the worst evil that infests education. The false sense of abstraction is connected with thinking of mental activity as something that can go on wholly by itself, apart from objects or from the world of persons and things. . . . [If real subject matter is removed and substituted by mere symbols] the world of studies then becomes a strange and peculiar world, because a world out off from -- abstracted from -- the world in which pupils as human beings live and act and suffer. Lack of "interest", lack of power to hold attention and stir thought, are a necessary consequence of the unreality attendant upon such a realm for study.[6]

The second principle requires that students be encouraged, through assignments, to do outside reading. They should be asked to prepare the subject matter before they come to the lecture room. Questions from the students and discussions among them should be encouraged. At present, the students come to the class without any reading or other preparation. The professor has to explain again and again through one method or the other, in order to make the lesson clear to most of the students. On the other hand, if students have already prepared the subject matter before coming to the class, the professor will take less time to explain and will be able to devote considerable time to discussions. Moreover, the knowledge obtained by the pupils due to their own efforts, is likely to be more lasting and more useful. This has not only been realized

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[6]John Dewey, Interest and Effort in Education, (Boston, 1913), pp.92-93.

by modern psychologists, but even Aristotle (384-322 B.C.) emphasized this point. Brubacher explaining Aristotle's views writes:

> The only way to learn to do things, he contended, was to do them. Therefore the only way he thought pupils could learn to think and organize their thoughts was to do their own mental tailoring. The teacher who would present the student with ready-to-wear thoughts deprived him of learning the art of cutting out and fitting together his own mental garments.[7]

It is justifiable to conclude, on the basis of Thorndike's ideas on the transfer of learning, that greater transfer of learning results when applications of principles to everyday life are pointed out to students. Producing maximum transfer of learning should be the teacher's conscious goal during teaching.

Another important thing to note is that the methods of teaching at school and college should not be so drastically different from each other. The development of personality and the formation of a desirable character should begin early in high school, and should be continued in the college. At present professors should try to deal with their new students as much as possible in the ways used by secondary teachers; they should only gradually change to the lecture and discussion method, so that the students may be able to adjust themselves gradually to these new methods of teaching.

The most important thing neglected at present is the formation of good reading habits. Evidence on record shows that students do not study regularly. Just a few months before the examination, they try to cram as much as possible. Motivation for regular study should be

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[7] John S. Brubacher, A History of the Problems of Education, (New York, 1947), p.172.

provided from the very beginning. The colleges should conduct short biweekly or monthly quizzes. The average of these quizzes should form a part of the principal's grade included in the Board's examination.[8]

Apart from the text, outside reading assignments and home work should be regularly assigned, checked and graded. It is recommended that each student should work in the laboratory for six periods[10] perweek per science subject. This would help the students to do new and interesting experiments apart from the experiments required in the text. The resulting problem of accomodation in the laboratories may be met by extending the duties of the staff on an "over-payment" basis.

It is also desirable that the maximum number of students in one class should not exceed 30. It will not be difficult in this case, to give individual attention to most of the students, provided the lecturer applies the widely-accepted psychological principles referred to above.

Recommendations for the Improvement in the Examination System

In connection with making the examinations interesting, Bean writes, "Educationally speaking, examinations are a part of the learning process. Learning must be motivated. Therefore an attempt to make tests a pleasure and an opportunity rather than a trial and an ordeal are [sic] worth while."[9]

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[8] For details, please see pp.140-142.

[9] Kenneth L. Bean, Construction of Educational and Personal Tests, (New York, 1953), p.110.

[10] A period being considered as 40 minutes.

In Chapter IV, the critical evaluation of the present system of examination of the Board of Secondary Education, Lahore, revealed that improvements can be made. One of the most important difficulties is that the full two years of student's effort and achievement are tested in two or three papers. Chance factors can operate easily to place him very low or very high in such an examination. No provision exists at present to minimize these factors. The result is therefore not very reliable. One way of compensation may be as follows:

Fifty marks may be assigned in each subject for the pupil's performances during his two years' stay in the college. This will be the average of his marks obtained in all the house examinations, class work and assignments. This will leave 150 marks for final examinations, both written and practical in each subject.

One of the greatest dangers in this scheme will be the differences in the marking standards among lecturers and colleges. To counteract this, the Board may have to devise a scheme which would minimize these differences. A tentative scheme is suggested below.

The Board may demand the principal to send these grades with a specified mean. For example, suppose of all the students who appeared from this college during the previous two years, the mean examination (not house) score in English was 50 per cent of the possible marks. The principal will submit the house grades of the new candidates so that their mean is 25 (i.e., 50 per cent of 50 marks.) The possible objections to this method may be:

(i) The students are not of equal ability every year. Why should the students of this year may gain or lose due to the performance of the previous years' students?

(ii) On what mean will the average be based in the case of a newly opened college?

(iii) For private students, who will award these marks and on what basis?

It seems difficult to help so far as objection (i) is concerned, but objections (ii) and (iii) could be removed by accepting a uniform average mean for all the students appeared in the F.Sc. Examination last year. But this would raise another and a more serious difficulty. The colleges where students usually get high grades would suffer while colleges with a poor result would gain by the uniform average mean. Moreover, this would altogether destroy the real purpose behind the scheme. Under the circumstances, it seems reasonable that students of categories (ii) and (iii) above should be awarded their marks solely on the basis of their written and practical examination papers. The point is summed up in the following rules:

Rule 1. Fifty marks are reserved in each subject for the student's performance during his two-year stay in the college. The principal shall submit, along with the examination, admission forms of the candidates, the house awards of the candidates in each subject. However, the mean in each subject shall not be a greater percentage of 50 than the percentage of 150 obtained in the examination by all the candidates who appeared in that subject from that college during the previous two years (one year for colleges not yet having a two-year record).

Rule 2. In cases of students appearing for the first year from newly opened colleges, as well as private candidates, the Board will

calculate the total number of marks in a subject by multiplying the examination papers' marks by the ratio $\frac{200}{150}$.

Rule 3. Passing rules in a subject will be as follows:

1. The candidate must obtain at least 25 per cent marks in the aggregate of all the papers in each subject; and

2. he must obtain at least 33 per cent marks in the aggregate of all the papers plus the principal's grade in that subject.

Another important thing to note is that the present question papers mostly require verbatim reproduction of the knowledge in the text books. The questions should be designed to test real understanding of the subject matter, the power of creativity and individuality.[10] If this is done, no student will be able to depend on "guess papers" Cramming is likely to be discouraged. It is also recommended that the question paper contain a portion of objective questions, which may be increased or decreased according to experience and the nature of the subject matter.

As pointed out earlier, in order to have more reliability in marking the answer-books, the instructions to sub-examiners should be very clear, well analyzed and fully detailed. It is also felt that the re-examination of answer-books by the head examiner should be increased from $7\frac{1}{2}$ per cent to 20 per cent. This will help considerably in minimizing the individual differences in marking among different sub-examiners, and in this way a more uniform standard of marking will be achieved.

Another important factor which cannot be overlooked is the excessive freedom of choice in the question papers. Sometimes it is

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[10] As an example, see Appendix E.

not too difficult for the teachers or the students to guess the expected questions, because the ample choice covers the risk to a very great extent. This also provides opportunity for the student to use ready-made material which he has memorized. This of course invalidates the examination because the response represents the memorizing capacity and not the ability of the candidate. In this connection Stalnaker writes:

> No experimental evidence has been published to show that skills and abilities can be adequately sampled by the use of optional questions; on the other hand, several studies have shown that optional questions complicate measurement and introduce factors of judgment which are extraneous to the ability being measured. For sound sampling, it is recommended that optional questions be avoided and that all examinees be asked to run the same ~~risk~~ race.[11]

It is therefore recommended that the Board should take definite steps to minimize the amount of choice in question papers, possibly over a period of years so as to minimize discontent.

The students and teachers alike have regarded the present curriculum as long and abstract. It should be modified according to needs as judged by the Curriculum Committee. Portions having no clear utility value should be omitted. Practical applications to real problems of every day life should be emphasized in the question papers.

General Recommendations

The two follow-up studies in Chapter IV have shown that third division matriculates usually make a poor showing in the F.Sc. Examination, and that third division F.Sc. students did poorly in B.A. and B.Sc.

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[11] J.M. Stalnaker, "The Essay Type of Examination", Educational Measurement, ed. E.F. Lindquist, (Washington, D.C., 1951), p.506.

Examinations. Many of them drop out before the examination is given. Even those who happen to pass usually get third division. This represents a great loss of time, energy and money. It is therefore recommended that third division matriculates be debarred from joining the college for advanced study. They should be encouraged to join technical lines such as electricity, weaving, printing etc. Pakistan is a growing industrial country. More and more factories are opening every year. For maximum production, skilled men are needed in all fields. The government should provide adequate training facilities for all those who are refused admission to higher education, in the fields appropriate to their interests and ambition.

This will also cause most of the students to change their attitudes towards the examinations. There are students who, although believing that their preparation for the examination is not appropriate and satisfactory, nevertheless appear in the examination just to "try out their luck".

Evidence on record shows that a significant majority of lecturers do not possess teaching degrees. They learn how to teach by trial-and-error experience. It is recommended that, in future, preference be given to lecturers having teaching degrees. Short in-service training programmes are desirable for the existing untrained staff.

In cases of long leaves and transfers, substitutes should be provided without delay. It usually takes months before a lecturer is appointed temporarily. The principal should be empowered to appoint a new person for a short period. The Director of Public Instruction, in the meantime, may find a suitable person for regular appointment.

Concluding Remarks

It is felt that the students in the Intermediate level are facing unusual difficulties in their studies. This results in lowering the standards of educational achievement, and causes many failures in the F.Sc. Examination. Suggestions to minimize these factors and their resultant educational decay are offered in three important directions, namely the medium of instruction, the methods of teaching and the system of examination. It is hoped that they will go a long way in improving the present state of affairs. Some of the suggestions, no doubt, involve substantial expenditures on the part of government or the Board, but it is believed that these expenditures will ultimately yield dividends in the form of a more highly developed and prosperous country.

APPENDIX A

LIST OF THE COLLEGES TO WHICH QUESTIONNAIRES WERE SENT

	For Professors	For Students
1. Islamia College for Women, LAHORE	5	10
2. Kinnaired College, LAHORE	5	8
3. Lahore College for Women, LAHORE	5	10
4. Dyal Singh College, LAHORE	5	10
5. F.C. College, LAHORE	5	10
6. Government College, LAHORE	5	10
7. Islamia College, LAHORE	5	15
8. M.A.O. College, LAHORE	5	10
9. Government College for Women, GUJRAT	5	5
10. Government College for Women, LYALLPUR	5	6
11. Government College for Women, MULTAN	5	6
12. Government College for Women, RAWALPINDI	5	6
13. Government College for Women, SIALKOT	5	7
14. Gordon College, RAWALPINDI	5	7
15. Murray College, SIALKOT	5	7
16. Government College, QUETTA	5	8
17. Government College, CAMPBELLPUR	5	5
18. Government College, D.G. KHAN	5	5

	For Professors	For Students
19. Government College, JHANG	5	5
20. Government College, LYALLPUR	5	10
21. Government College, MIANWALI	5	7
22. Government College, MONTGOMERY	5	10
23. Emerson College, MULTAN	5	8
24. S.E. College, BAHAWALPUR	5	10
25. Government College for Women, BAHAWALPUR	5	5
Totals:	125	200

APPENDIX B

NUMBER OF PROFESSORS AND STUDENTS

WHO RESPONDED TO THE QUESTIONNAIRES

	Professors	Students
1. Islamia College for Women, LAHORE	0	9
2. Kinnaired College, LAHORE	2	7
3. F.C. College, LAHORE	5	9
4. Government College, LAHORE	5	8
5. Government College for Women, GUJRAT	4	5
6. Government College for Women, MULTAN	5	6
7. Government College, QUETTA	2	6
8. Government College, CAMPBELLPUR	5	4
9. Government College, D.G. KHAN	4	5
10. Emerson College, MULTAN	5	8
11. Government College for Women, BAHAWALPUR	3	2
Totals:	40	69

APPENDIX C

1. QUESTIONNAIRE FOR STUDENTS

Dear friend,

As a partial requirement for my M.A. (Education) Degree at the American University of Beirut, Lebanon, I am undertaking a study to discover the causes of failure in the F.Sc. Examination.

Since no respondent will be identified in the study, your name is not essential. The information supplied by you will be kept confidential. However, if you care to have your name printed in the Appendix, please write it below:

Name:_____

(Musarrat Ali Khan)

Please put a check mark (✓) for your answer against the correct word or sentence.

1. Age:_____ Sex: _____

2. Year of passing the Matriculation Examination:_____ Division:_____

3. Subjects in Matric: 1. English, 2. Gen. Knowledge, 3. Mathematics, 4._____ 5._____

4. In what year did you appear in the F.Sc. Examination for the first time?
_____

5. Subjects in F.Sc.: 1. English, 2._____ 3._____ 4._____

6. What was the result?
   a. Passed in_____(Division)
   b. Failed in_____(Subjects)

7. If you passed, what subjects did you take in III Year?
1. English, 2._____ 3._____

8. If you failed, please give all the dates you appeared subsequently in the F.Sc. Examination, with the result:

Appeared in: (Month & Year)	As a regular student, or as a private student.	Passed: Division	Subjects in which failed

9. Why are you studying (or did you study) in F.Sc.? Please check one.
   _____a. My guardians wished so, although I am not (or was not) interested at all.
   _____b. The F.Sc. is (or was) a pre-requisite for the profession I aspire to, otherwise I would not have chosen these subjects.
   _____c. I am (or was) some what interested in these subjects, apart from my guardian's pressure.
   _____d. I am (or was) very interested in these subjects.
   _____e. Some other reasons (Please state):_____
   _____

(2)

10. The time I have generally devoted to study is as follows:
_____hours per day during the first half of the year.
_____hours per day during the second half of the year.
_____hours per day during the one month preceding the Examination.

11. During my study in F.Sc. I felt the following difficulties: (Please check as many as you think proper)
_____a. My English was poor.
_____b. I was not familiar with the English terms, as I was taught in Urdu in my previous school.
_____c. Home work was not assigned frequently, so that I could not get proper practice.
_____d. I could not understand most of the lectures (or practicals)
_____(1) due to a large class or group of students
_____(2) due to some physical handicap such as, eye-short-sightedness, poor hearing etc.
_____(3) due to my poor health.
_____(4) some other reasons: (Please state)_____
_____
_____e. The courses were too lengthy and abstract.
_____f. There was no practical application to make it interesting.
_____g. I had financial troubles.
_____h. I had family worries.
_____i. Any other difficulty (Please state):_____
_____
_____

12. Please check one of the following:
_____a. Practical hours were enjoyed by me.
_____b. I did practicals not for enjoyment but for my clear understanding of the text.
_____c. I did practicals because they were compulsory, although I was not interested.
_____d. Practical hours were boring for me, and I often did not understand them.

13. How many English novels, apart from your text, have you read during the last two years?_____

14. How many books, apart from your text, have you read on each subject during the last two years.
English:_____, Physics:_____, Chemistry:_____, Biology:_____, Mathematics:_____.

15. If you failed in the F.Sc., what do you think are the main reasons?
a._____
b._____
c._____
d._____

16. If you passed the F.Sc. Examination, please give your opinion as to the reasons for the failures of so many students:
a._____
b._____
c._____
d._____

2. QUESTIONNAIRE FOR PROFESSORS

Since you are an expert in the field, your help is solicited by a Pakistani student, Musarrat Ali Khan, in connection with his thesis in partial fulfillment of the requirements for the Master's Degree in Education. Investigation is being made to discover the causes of failures in the F.Sc. Examination.

Your name is not essential and the information given by you will be kept confidential. However, if you care to have your name included in the appendix, please write it here:

Name:_____

(Musarrat Ali Khan)
Education Student,

(F.R. Korf)
Acting Chairman,
Education Department,
American University of Beirut

1. Sex:_____ Age:_____

2. Designation:_____. Subject you teach:_____

3. (a) Qualifications:_____
   (b) Number of years of teaching experience to F.Sc. classes:_____

4. Name of the College in which you teach:_____

5. Average number of students in your class:_____

6. About what percent of your students fall in each of the following categories?
   a. Very interested:_____
   b. Interested:_____
   c. Somewhat interested:_____
   d. Not interested at all:_____

7. What do you believe to be some important reasons for the lack of interest which some students show?
   a._____
   b._____
   c._____
   d._____

8. In your opinion what are the main difficulties faced by students? Please put check mark (✓) against those you think proper.
   _____a. Poor English.
   _____b. Change in the language used as the medium of instruction, from Urdu to English.
   _____c. Problems of adjustments from school to college life, due to different methods of teaching.
   _____d. Any other difficulty (Please state):_____
   _____

9. About how many hours, apart from the lecture hour, do you devote to help those who have difficulties with their studies?
   a. About _____ hours weekly.
   b. About _____ hours monthly.

10. Please give the approximate percentage of your students to whom you find it

11. What are the main reasons making it impractical to give individual attention to all the students?
_____a. Personal liking for the lecture method.
_____b. Too many students in the class.
_____c. Responsibility to cover the heavy syllabus.
_____d. Lack of interest among the students.
_____e. Lack of equipment for demonstration.
_____f. Others, if any:_____
_____
_____

12. Who has prescribed the text book?
_____a. Yourself.
_____b. The head of your Department.
_____c. The Principal.
_____d. The Board of Secondary Education.

13. What is your opinion about the text book? Please check one.
_____a. Very good.
_____b. Good.
_____c. Moderately good.
_____d. Somewhat poor.
_____e. Very poor.

14. What is the title of the book and the name of the author of the text book you follow?
_____

15. What is your opinion about the prescribed curriculum?
_____a. Excellent.
_____b. Good.
_____c. Satisfactory.
_____d. Somewhat poor.
_____e. Poor.
_____f. Very poor.

16. What major modifications would you suggest in the curriculum?
a._____
b._____
c._____
d._____

17. How many hours must each student work in the laboratory? _____

18. Do you combine the demonstration method with the lecture method?
_____a. Never.
_____b. Seldom.
_____c. Sometimes.
_____d. Always.

19. What types of questions do you set in the Examinations?
_____a. Problem-question type.
_____b. Yes-No or multiple choice objective questions.
_____c. A combination of the two (a and b).
_____d. Oral Examination (Interview method).
_____e. Others (Please state):_____
_____

20. Which one of the above types do you think is the most useful? _____
_____
Why? _____

3. COVERING LETTER

To

The Principal,

_____

_____

Dear Sir/Madam,

May I request your kind favour and help for a Pakistani student, Musarrat Ali Khan, who is working for his M.A. (Education) Degree at the American University of Beirut, Lebanon. Mr. Khan is writing a thesis on "The Causes of Failure in the F.Sc. Examination" as a partial fulfillment of the requirements for his degree.

Attached herewith are _____ questionnaires for the F.Sc. lecturers and professors and _____ questionnaires for some of those students who failed in F.Sc. and have joined II Year again. Please give these to students who are admitted first, or, if many are present, give them to the first names on an alphabetical list. I will appreciate it if one questionnaire is given to a student who has passed F.Sc. and who has joined III Year Class. It will be highly appreciated if you can arrange to send me these questionnaires after they have been filled in by the members of your staff (English, Physics, Chemistry, Biology and Mathematics) and students.

It will not be out of place to mention here that the information asked for in these questionnaires is essential for correct analysis. As Mr. Khan has to complete his work within a specified time, I shall be highly obliged if you will take a personal interest in expediting the return of the questionnaires.

Thanking you in advance for your assistance.

I am,

Yours Sincerely,

(Hashmat Ali Khan)
797-N, Samanabad, LAHORE.

September 1959

APPENDIX D

OUTLINES OF SYLLABUS FOR THE SUBJECT OF

MATHEMATICS INTERMEDIATE EXAMINATION, 1960 **

MATHEMATICS PAPER A

1. ALGEBRA (5/12)*

Quadratic Equations involving one variable. Simultaneous Equations. Theory of Quadratic Equations including the rise of imaginaries. Fundamental relations between the Roots and Co-efficients in the case of a Cubic and a Biquadratic. Partial Functions. Progressions including Σn^2 and Σn^3. Formulae for ${}^{n}p_{r}$ and ${}^{n}c_{r}$. Binomial Theorem for a Positive Integral Index. Statement of the Binomial Theorem for Negative and Fractional Indices and its application in the case of Root Extraction. Expansion of a Determinant of the third order.

2. TRIGONOMETRY (7/12)

Circular Measures of an Angle. Trigonometrical Ratios and the simple relations connecting them. Relations between Trigonometrical Ratios of Angles differing by multiples of right-angles, Graphs of simple Trigonometrical Functions. Addition and Subtraction Formulae and the formulae deducible therefrom. Inverse Trigonometrical Functions. Solution of Trigonometrical Equations. Summation of simple Trigonometrical Series by the Method of Differences. Logarithms. Different Formulae connecting the Sides and Angles of a Triangle. Solution of Triangles, Area of a Triangle, Radii of the Circumcircle, the In-circle, the e-circle and Nine-point Circle of a Triangle.

$\lim_{\theta \to 0} \frac{\sin \theta}{\theta} = 1$ Area of a Circle.

MATHEMATICS PAPER B

1. CO-ORDINATE GEOMETRY ($\frac{1}{2}$)

Rectangular Axes. Distance between two points. The Ratio-Formulae,

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*Out of 12 questions in Paper A, 5 are to be set from algebra.

** Board of Secondary Education, The Calendar 1959-61, (Lahore, 1959).

Area of a Triangle. Locus and its Equation. Equations of a Straight Line in different forms. Intersection of Straight Lines. Angle between two Straight Lines. Length of the Perpendicular from a given point on a given line. Bisectors of Angles between two straight Lines. Elementary properties of the Loci represented by the Equations.

$$x^2 + y^2 + 2gx + 2fy + c = 0, \quad y^2 = 4ax \text{ and } \frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$$

including the use of Parameters and properties of Pole and Polar. Radical Axis of two Circles. Equations of tangents and Normals to the above Loci.

Calculus Methods to be used wherever possible.

Co-ordinates in three dimensions, Equation of a Plane, Straight Line as an intersection of 2 planes.

2. DIFFERENTIAL CALCULUS (5/12)

Notion of Related Variables. Differentiation of Simple Algebraic Trigonometrical, Exponential, Hyperbolic and Logarithmic Functions. Successive Differentiation including application of Leibnitz's Theorem. Statement of Taylor's and Maclaurin's Theorems and application to the expansion of e^x, $\log(1+x)$, $\sin x$, $\cos x$ and the general Binomial expansion. Maxima and Minima in one variable without reference to Taylor's Theorem. Tangents and Normals to Cartesian Curves.

3. INTEGRAL CALCULUS (1/12)

Simple cases of integration (i) by substitution, (ii) by Parts, and (iii) by the use of Partial Fractions.

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