SCIENCE EDUCATION PROJECT
EVALUATION OF SCIENCE CURRICULUM IN THE LIGHT OF IQBAL'S EDUCATIONAL PHILOSOPHY

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Introduction

Science provides the basis for modern technology– the tools, materials, techniques, and sources of power that make our lives and work easier. Curriculum is a tool to facilitate the achievement of national objectives. It is defined as a reflection of how people of a society think, feel, believe and do. It is also the sum total of school efforts to influence the learning, whether in the classroom, on the playground or out of school.[1]

Pakistan is an ideological country and its education system stems from the philosophy of the great thinker of East, Dr. Muhammad Iqbal, who conceived the idea of Pakistan. The teacher is an important element in Iqbal's pattern of education. The main characteristic of Iqbal's view about the teacher is that he is the child's ideal, guide, and sometimes even a model to be followed. He is a leader who inspires and teaches by example as well as by precept. According to Iqbal the teacher during his life career is a learner continually engaged in his growth with an open mind and a broad horizon. According to him discipline does not come from the teacher– neither as obedience to his will nor from his interesting instruction– but from a social order of students as a function of a group purpose.[2]

In the education which Iqbal's philosophy of action postulates, there is room for that communion with self and with Nature which prepares one for spiritual communion with the Absolute or God. It is in these moments of quiet communion, when overt action has ceased and we allow the mysterious influence and impulses of the world of art and nature to play on us that our intuition and our emotions find genuine self-expression and our personality gains that inner poise and repose which is a source of true happiness and joy.[3]

Since the middle ages, infinite advance has taken place in the domain of human thought and experience. The extension of Man's power over Nature has given him a new faith and a fresh sense of superiority over the forces that constitute his environment. New points of view have been suggested: old problems have been restated in the light of fresh experience and new problems have arisen. It seems as if the intellect of man is outgrowing its own most fundamental categories of time, space and causality. With the advance of scientific thought even our concept of intelligibility is undergoing a change. The theory of Einstein has brought a new vision of the universe and suggested new ways of looking at problems common to both religion and philosophy. [4]

Iqbal asserts that nations can live a life of honour and dignity only when they acquire mastery over the sciences while holding fast to an unflinching faith in the one and only Omniscient and Omnipotent Allah who is the Creator and Sustainer of the Universe. It is only in this way that man can become the noblest of God's creatures and His vicegerent on earth. [5]

Iqbal was not only a philosopher and poet but also a vehement supporter of scientific education. He knew the requirements of the near future. Modern science ought not to mock at metaphysics, for it was a metaphysician– Leibnitz– who first gave science her working idea of matter by the saying that the 'substance' was essentially 'force' and 'resistance'. Borrowing this notion from metaphysics, science devotes herself to the study of the behaviour of this force; and it is clear that she could not have discovered it for herself. [6]

Ideas act and react on each other. The growing spirit of individualism in politics is not without its influence on contemporary scientific thought. Modern thought regards the universe as a democracy of living atoms.[7]

Iqbal realizes that science takes sectional snapshots of Reality and represents but one method of apprehending it. By itself it cannot give man a full, complete and emotionally satisfying picture of Reality. Religion, on the other hand, "demands the whole of Reality and, for this reason, must occupy a central place in any synthesis of all the data of human experience". [8]

Iqbal is in full agreement with the epistemology of Quran. The three sources, sense perception, intellect and intuition, are the fundamental ones, on which Iqbal bases his theory of knowledge. [9]

According to Taylor and Alexander (1954), curriculum is the sum total of school efforts to influence learning, whether in the classroom, on the playground or out of school.[10]

Scientific and technical education is imperative to improve the technical skills of the individuals and progress of the country. The government is making all out efforts to enhance scientific and technical education. In this regard the first phase of Science Education Project (SEP) for secondary schools was completed with the assistance of Asian Development Bank (1995)[11] and the feasibility for launching phase-II (SEP-II) envisages up gradation of physical facilities in about 2000 schools, development of research based mathematics curriculum and introduction of human resources development programmes in science and mathematics education.[12]

Successive development plans for Pakistan have emphasized the need to improve science and mathematics education. This seems to be crucial for increasing the country's capacity to adopt modern technological processes. Under the National Education Policy (1998-2010) and the ESR Programme, the Government has been involved in an endeavour to improve the quality of education by establishing suitably equipped laboratories, revising science and mathematics curricula, developing a computer science curriculum and providing a critical mass of Lead Master-Trainers for science/maths teachers' training through the Science Education Project (Phase-II).

The Government of Pakistan launched the second phase of Science Education Project (SEP-II) with the financial assistance of Asian Development Bank (ADB) in 1998. It was intended to improve the science and mathematics curriculum with a view to integrate 'General Academics' with the higher, state of the art skills (problem solving, etc.) on the one hand and technical/vocational skills on the other along with new areas to help develop an enterprising attitude in Classes VI-X. It was also aimed at developing computer literacy programmes for elementary class and computer curriculum for Classes IX-X.

Without quality science education the students' scientific concepts remain vague and the academic standard is not so high. It therefore looks appropriate to investigate the impact of the Science Education Projects on the promotion of science education in Pakistan.

Objectives

The study was conducted to evaluate the secondary school science curriculum in the light of opinion of the heads of institutions and science teachers.

Procedure

All the heads of institutions and science teachers of 528 government secondary schools were included in the 'population' for this study. The sample comprised of a hundred heads of institutions

and science teachers from the cluster of 528 project schools. Two types of questionnaires were developed in order to collect views of the heads of institutions and science teachers about the various aspects of the curriculum at secondary level in Punjab. The questionnaires, with a five-point rating scale, were administered to the sample for collection of data.

Data Analysis

For analyzing the collected data, the researchers counted, totaled and tabulated the responses of the heads of the institutions and science teachers on each category of the questionnaire, which were shown in terms of number and percentage of respondents in each category.

The Chi-square was used to examine the statistical significance of the responses. For judging the validity of results, percentages were also used to verify the significance of each statement.[13]

Results

The collected views were tabulated. The results, extracted by using the Chi-square, are presented as under:

Table 1: Current science syllabus is job oriented

Responses	SA	A	UD	DA	SDA	Total	χ^2
Heads	2	54	10	34	0	100	108.80
Teachers	2	48	18	26	6	100	67.20

* Significant df=4 χ^2 at 0.05 level = 9.49

Table 1 shows that the obtained values of χ^2 both for heads of institutions and science teachers were found to be significant at 0.05 level. Hence the statement that "Current science syllabus is job oriented," is accepted.

As far as the opinion of both the heads of the institutions and science teachers about the job-orientation of current science syllabus is concerned, it is supported by the Government's finding in 2000 that the job performance of graduates from project schools, as rated by their supervisors, was higher than that of graduates from non-project schools.[14]

Table 2: Current science syllabus creates creativity among the students

Responses	SA	A	UD	DA	SDA	Total	χ^2
Heads	4	54	14	20	18	100	72.60
Teachers	6	55	22	12	5	100	85.70

* Significant df=4 χ^2 at 0.05 level =9.49

Table 2 shows that the obtained values of χ^2 both for heads of the institutions and science teachers were found to be significant at 0.05 level. Hence the statement that "Current science syllabus creates creativity among the students," is accepted.

Table 3: Current science syllabus promotes rote learning.

Responses	SA	A	UD	DA	SDA	Total	χ^2
Heads	2	489	8	34	8	100	79.60
Teachers	4	48	20	26	2	100	70.00

* Significant df=4 χ^2 at 0.05 level = 9.49

Table 3 indicates that the obtained values of χ^2 both for heads of the institutions and science teachers were found to be significant at the 0.05 level. Hence the statement that "Current science syllabus promotes rote learning," is accepted.

A report of the Government from 1991 supports the opinion that examination system is only encouraging rote-learning with no emphasis on testing, understanding, comprehension and application of knowledge.[15]

Table 4: Current science curriculum is formulated according to policy objectives.

Responses	SA	A	UD	DA	SDA	Total	χ^2
Heads	2	60	28	10	0	100	124.40
Teachers	7	48	26	18	1	100	67.70

* Significant df=4 χ^2 at 0.05 level = 9.49

Table 4 indicates that the obtained values of χ^2 both for heads of the institutions and science teachers were found to be significant at the 0.05 level. Hence the statement that the "Present science curriculum is formulated according to the policy objectives," is accepted.

As far as the opinion of the experts is concerned, it contradicts Kiani (2002) that the science curricula at the secondary and O-levels were clear and well-formulated but not translated into curricula objectives.[16]

Table 5: Current science curriculum promotes critical thinking among students.

Responses	SA	A	UD	DA	SDA	Total	χ^2
Heads	2	58	10	20	10	100	98.40
Teachers	7	48	26	18	1	100	84.20

* Significant df=4 χ^2 at 0.05 level = 9.49

Table 5 indicates that the obtained values of χ^2 both for heads of institutions and science teachers were found to be significant at the 0.05 level. Hence the statement that "Present science curriculum promotes critical thinking among students," is accepted.

Recommendations

As the study revealed that current science syllabus promoted rote learning and that syllabus for secondary classes was lengthy and was not meeting the present-day needs, it is recommended that curricula be revised and upgraded to meet the international standards. The curricula should be according to the present and future needs and demands of the society. It should be arranged in a way to discourage rote-learning. Creative thinking, logical reasoning and understanding of concepts should be ensured in the curricula. Philosophical thinking may also be encouraged during the teaching of science.

NOTES AND REFERENCE

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