The S.U. Jour. of Ed. Vol.41 Issue 2011 –12, Pp.110-120

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NEED FOR IMPROVING THE PHYSICS CURRICULUM AT INTERMEDIATE LEVEL IN SINDH

Abstract

Education is the study to develop human ability and behavior. Curriculum helps to devise strategy for transferring the appropriate knowledge and skills. Curriculum can refer to the total structure of ideas and activities developed by an educational institution to meet the learning needs of students and to achieve desired educational aims. The syllabus determines the basics content of instructions in a given subject and the range of knowledge and skills which students must acquire. The objective of the study was , To explore the opinion of Physics teachers, To carry out comprehensive analysis of Physics curriculum. Survey research design was adopted. The population of the study was Physics teachers working in the public sector institutes of Sindh along with the existing textbook of physics. The data were collected through a carefully designed questionnaire. Data were analyzed and It was found that present curricula are not matching with the current needs. Further the teachers' are not well-versed with the subject and lack the required teaching skill. In light of the findings concrete recommendations were made.

Keywords: Physics Curriculum, intermediate level

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Introduction

Education is the method of transmission of social norms and values that can be manipulated into an exploitative form of social control. for the purposes of bringing about the radical changes through which today's society may be reformed, the aim of education reform must include curricula change through which the development of each individual intellectually and socially can be harnessed to that persons fullest potential. Quality and content are important for meaningful education.

The quality and content of education is basically determined by the curriculum, textbooks, skill of teachers and the assessment system.

Text book is of immense importance in deciding that what is taught and how it is taught. By developing the improved textbooks along with appropriate instructional technology and professionally skilled teachers help in meeting demands of modern day world. The physics concepts can be developed in the students by providing the upgraded the textbook, better educational electronic facility and well trained teachers.

To meet the challenges in the new era, there is need to upgrade physics curriculum at intermediate level. the study addressed the following objectives, To explore the opinion of physics teachers about the worth of Physics curriculum at intermediate level, To carry out comprehensive analysis of Physics curriculum, to identify problems, issues, and weakness in existing textbook of physics.

The national educational policy (1992,p.24) had also maintained that "science curricula would be revised and compatible with the demands of the knowledge "therefore present textbook of physics is not fulfilling the need of teachers and learners. Teachers and learners are pointing out the weakness of textbook .The rationale behind the research is to find out the cause of failure and explore the opinion of teachers about the textbook.

Literature Review

Science education develops truthfulness and reasoning, that shows the spiritual spirit and motivation to deal with others equally. Teaching of science is essential for developing scientific attitudes. The learning of sciences is based upon the fundamental principles of psychology, i.e. learning by doing, learning by observing concrete and living specimen (Yadav, 1992). According to Khan, science should be taught from a much wider perspective than an abstract cut off from life, thus for the production of practical minds and for the development of practical skills.

Curriculum referred to the total structure of ideas and activities developed by an educational institution to meet the learning needs of the students and to achieve desired educational aims. A curriculum is a plan of learning. Curriculum is the construction of knowledge and experience systematically developed under the auspices of the school to enable the learner to increase his, her control of knowledge and experience (Aggarwal, 1990).

According to (Skilbeck,1987) indicated the following purposes of evaluating a curriculum development process To maintain standards, To select students, To motivate Learning, To quite teaching, To furnish instruction, To appraise teacher, teaching methods, books, curricular content, etc. In 1983 National Institute of Psychology (NIP) administered a science and mathematics test to compare the skills of Intermediate levels children in various foreign countries against that of their Pakistani counterpart. The report concludes that 'ultimately, many of our students of grade 11 remain less proficient in science. According to the port, 'what is probably most significant is the extremely slow pace of learning.

In spite of several curricular reforms in Science Education the quality of instructions particularly at intermediate level has not improved considerably. Therefore, it is necessary to find out the causes of failure in science subjects at intermediate level and provide a solid and stable base for science teaching. Ali and Rana, (1996) stated the state of affairs prevailing at Intermediate level. The following factors are

cause of failure in science subjects. Lack of guidance programmes, Un-trained teachers, Shortage of staff, Burden of periods, In-adequate and ill-adequate science laboratories, The influence of examinations, Lack of due attention towards practical, A lack of motivation among students, Lack of teacher parents, Lack of co-operation of authorities and government, Science teachers face several problems while teaching, Syllabus is loaded, The examination system enhances rote memorization, Goals/objectives of science subject are not considered during evaluation, Science subjects are not focusing on real life situation of students.

The influence of textbooks in potentially greater in developing countries than in the industrialized ones and both the World Bank and UNESCO have emphasized this in their practical development efforts. In the 1800s and well into our own country teaching frequently revolved around reading aloud, memorization and verbatim repetition from books. The authority of the textbooks was indisputable and undisputed (Johnson, 2001). Because of the great dependence on the textbooks, their selection should be considered as important as course of study construction itself.

According to Smith (1957) as quoted by Jumani (1998) "the appraisal of each criterion will involve two questions, firstly the criterion adequately supported by facts with sound reasoning, and secondly does its use contribute to the realization of desirable and specific educational and objectives". Though the objectives may be same but there are various approaches to achieve them? Das (1985,) described the following criteria for selection of textbook. i.e. Contents, Organization, Language, Physical aspects, and General aspects. The content ia selected in the light of objectives. According to Balsara (1999) "Subject matter is included if it is thought to be essential to the mastery of the field to which it belongs. Not all the subject matter of a field such as mathematics or history can be included in a series of courses".

The concepts, rules and principles in the content should be applicable in the real life situations. Content should be made interesting to the learners for effective learning through relevant activities and experiments. According to Balsara (1999) "a common interpretation of

this criterion is that the subject matter must satisfy the needs of learners. The subject matter in the curriculum must be interesting to the learner". The content should be according to the cognitive level of the learner. The concepts should be logically ordered, from simple to complex. Pint (1993) defined sequence as the order in which content is broken down into a manageable sections. The order in which those parts are presented to learner is called sequencing".

The colleges are mostly working on traditional routine and carried out its academic activities in an unsatisfactory manner. The curriculum places an emphasis on rot learning there is no adequate provision for practical activities and experiences. It is mainly dominated by external assessment. More over as the development of useful skills and the inculcation of the right of interest attitudes and values are not given sufficient emphasis. Such curriculum lack modern knowledge and not fit with present demands of the learners. There is thus urgent need to revise up grade and improve the college curriculum.

Methodology

The overall strategy was survey. The population of the study consisted of all the Physics teachers working in the public sector higher secondary institutes of Sindh, Stratified random sampling design was adopted. Total sample size was 60 teachers. A questionnaire comprised of thirty items was developed. The data were analyzed statistically.

Analysis of findings

Item-wise analysis of each item of the questionnaire through chi square. The null hypothesis (Ho) to be tested in each case is: There is no significant difference in the opinions of senior and junior college teachers regarding the improvement of physics curriculum in Sindh, in respect of each item of the questionnaire.

1. Test statistics :x^2 $x^2 = \sum \frac{(fo - fe)^2}{fe}$
2. Level of significance (a) = 0.05
3. Degree of freedom (df) = K – 1 = 3-1 = 2
4. Critical value of x^2 = 5.99
5. Decision rule: reject null hypothesis if computed x^2 > tabulated x^2

Item: Method of explanation of given application

Conclusion

Referring the table of x^2 we found that the tabulated value of x^2 = 5.99 with df = 2 at α = 0.05 is smaller than the calculated value of x^2 = 27.70. Hence Ho is rejected and it is concluded that there is significance difference in views of senior and junior college teachers regarding the method of explanation presented in physics curriculum.

From the inspection of the table it is clear that most of the college teacher believe that method of the explanation of given application is not satisfactory and it can be improved further.

Item: Language of each chapter.

Conclusion

Referring the table of x^2 we found that the tabulated value of x^2 = 5.99 with df = 2 at α = 0.05 is smaller than the calculated value of x^2 = 21.8. Hence Ho is rejected and it is concluded that there is significance difference in views of senior and junior college teachers senior and junior college teachers regarding the language of each chapters.

From the inspection of the table it is clear that most of the college teacher believes that language of each chapters lack clarity and it emphasized desired change to meet the set objectives.

Item: Present curriculum does not create the interest.

Conclusion

Referring the table of x^2 we found that the tabulated value of $x^2 = 5.99$ with df = 2 at $\alpha = 0.05$ is smaller than the calculated value of $x^2 = 14.7$. Hence Ho is rejected and it is concluded that there is significance difference in views of senior and junior college teachers regarding the present curriculum.

From the inspection of the table it is clear that most of the college teacher believe that the present curriculum does not create the interest.

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Item: Analysis of Physics Curriculum is needed at higher secondary level for curriculum development.

Conclusion

Referring the table of x^2 we found that the tabulated value of $x^2 = 5.99$ with df = 2 at $\alpha = 0.05$ is smaller than the calculated value $x^2 = 17.42$. Hence Ho is rejected and it is concluded that there is a significance difference in views of senior and junior college teachers regarding the analysis of physics curriculum.

From the inspection of table it is clear that most of the principals strongly believe that analysis of physics curriculum is needed at higher secondary level for curriculum development.

The following cumulative conclusions were drawn

1. Most of teachers agree that mostly students face difficult to understand the concepts. Therefore, practical application should be focused.

2. The content helped in understanding the basic concepts of physics, although their effectiveness for developing critical thinking was uncertain.

3. Students do not read the text book. They depend upon the notes of teacher. Therefore attractive book should be designed keeping the interest of student.

4. Organization of the topic should be simple to complex, language should be easy and understandable

5. Most of teachers agreed that number of solved examples should be increased, which create the interest in students

6. The selection of content for intermediate level may be based upon the interest and needs for development of scientific skills, and attitudes of students

7. The Teachers considered, the book should develop the practical approach of students, so latest equipment may be provided to the college

8. Sufficient audio-visual aids may be provided to teachers in order to enhance the effectiveness of the process.

9. Teachers know the problems of students and need of society therefore maximum participation of the teachers be ensured in the curriculum development process.

10. Mostly teachers agreed that curriculum should be developed after three year to see the need of world.

11. Most of teachers agreed that exercise's questions are difficult to solve. Therefore, exercise problems should be easy to clear the concept of student.

12. The glossary and index should be added in the end of book. Students can get the definition.

Recommendations

Curriculum development is continuous and dynamic process. Textbook must be used as a guide and source of knowledge for the teachers as well as the students to understand the problems and procedures. Books are not complied once for all. Human life and its knowledge is dynamic nature, capable of transition. Change is the symbol of progress. Therefore books related to science and technology must be continuously reviewed and revised. The following recommendations are made on the bases of finding and conclusion.

- Activity based curriculum should be implemented
- Physics Curriculum may be revised after two years.
- Teacher manual may be provided at the time of the introduction of new book.
- The selection of content for intermediate level may be based upon the interest and needs for development of scientific skills, and attitudes of students.
- Latest softwares regarding the science education and internet facilities may be provided in the school.
- It is vital to regulate science education in collaboration with Pakistan Science and Research Council.
- Religious references may be explained in the book where required.
- Counseling and guidance in the science (physics) may be provided.
- Internal evaluation system may be introduced.

- Climate of college and class may be improved by using the board and charts.

- Examples for sustaining the interest of the students may be included in physics curriculum.

- The teacher should give preference to practical work.

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