ORIGINAL RESEARCH PAPER

Volume-7 | Issue-2 | February-2018 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

DEVELOPING A PROGRAMME FOR INTEGRATING INNOVATION SKILLS IN THE SECONDARY SCHOOL CURRICULUM

Education

Manisha Research Scholar, Department of Pedagogical Sciences, Faculty of Education Dayalbagh Educational Institute (Deemed University) Dayalbagh, Agra

Nandita Satsangee Prof. Department of Foundations of Education Dayalbagh Educational Institute (Deemed University) Dayalbagh, Agra

ABSTRACT

This study has been taken up as an endeavor to design a Programme to integrate Innovation Skills in the Secondary School Curriculum. Descriptive research method was used in the present study. 130 science students of IX class (100 from Radhasoami Educational Institute and 30 from Prem Vidyalaya Girls Inter College Dayalbagh, Agra) has been selected by purposive sampling. Mean has been used for analysis of quantitative data and content analysis for qualitative data. After analysis it was observed that 20 skills were selected for Innovation Skill test construction. Survey of current status of Innovation Skill reveals that only 12 percent students were found to be highly innovative. A Programme based on Innovation skills having high need gap was developed. This study will have implications for different personal related to the field of education as Curriculum planners and Educational advisors, policy makers, teachers and students.

KEYWORDS

Innovation Skills, Science curriculum.

INTRODUCTION

Globalization, climate change, technological change and demographic change are some of the major challenges in the present scenario which require a newer response from our education system Chell and Athyde (2009). Along with these challenges India has a huge reservoir of unmet needs in diverse areas such as health, education, agriculture, energy, urbanization and so on. These unfilled needs affect a large portion of our population. These problems and needs require new approaches and solutions rather than adopting conventional methods of solving these problems. Innovative solutions can provide the key to the answers of many problems, especially in those fields where conventional approaches have failed. According to National Innovation Council (2010) innovation has been defined thus – *"Innovation involves thinking differently, creatively and insightfully to create solutions that have an impact in terms of social and economic value."* Innovation can be in form of a new idea, device or process. An innovative solution to a problem may be better than a conventional approach if it solves the problem of not only the higher class but also improves the lives of the people at the bottom of the economic pyramid. This can be achieved by schools and colleges which can help students to develop these skills with the help of curriculum, extracurricular activities and multidisciplinary approach. But the enduring problem is that current classroom practices don't focus enough on promoting creativity and innovation (Adams,2005) Teachers can provide a supporting hand in the development of these skills by adapting influential teaching methods and experiments where learners are motivated to be adventitious in their thinking and learning. Regardless of subjective discipline, a problem solving, logical thinking and curiosity driven approach helps in development of creativity.

OBJECTIVES

1) To identify the Innovation Skills with reference to secondary school learners.
2) To construct a tool to measure the Innovation Skills of secondary school learners.
3) To survey the status of Innovation Skills among secondary school learners.
4) To develop a programme for development of Innovation Skills.
5) To evaluate the developed programme
6) Try out of the programme on a small sample.

DELIMITATION OF THE STUDY

The study was delimited to class IX Science students of Radhasoami Educational Institute and Prem Vidyalaya Girls Inter College Dayalbagh, Agra

METHODOLOGY OF THE STUDY

The study can be broadly classified under the descriptive research method. Both qualitative and quantitative research methodologies were incorporated in the present study. The former was used for the development of innovation Programme etc. and the latter was used for the rating and identification of Innovation Skills and tool construction.

PROCEDURE AND DESIGN OF THE STUDY

In the procedure of programme development following phases were incorporated:

Phase I: Identification of Innovation Skills relevant to secondary school learners.
Phase II: Construction of a tool to measure the selected Innovation Skills.
Phase III: Survey of the current status of Innovation Skills among secondary school learners.
Phase IV: Developing a programme of Innovation Skills for the secondary school curriculum involving:
Phase V: Evaluation of the programme by experts and its try out on small scale.

SAMPLE OF THE STUDY

Sample was selected by using purposive sampling. It comprised of 130 science students of IX class (100 from REI Inter college and 30 from Prem Vidyalaya Girls Inter College, Dayalbagh Agra). For tryout of the Innovation skill Programme 38 students were selected from REI Inter College.

TOOLS OF THE STUDY

Self made tools used in the present study were: Innovation Skills Identification Questionnaire, Self made Innovation Skills Test for testing Innovation Skills and Programme evaluation Proforma.

STATISTICAL TECHNIQUES

Mean was used for interpretation and analysis of quantitative data and for qualitative data Content analysis of qualitative remarks given by the experts has been carried out.

FINDINGS OF THE STUDY

Identified skills through survey of related literature were categorized into following dimensions: Generating New Ideas, General abilities and approach to work, Working in a team, Turning ideas into process and products. Under each dimension 7-13 skills were enlisted. Total 37 skills were enlisted in the preliminary draft. These skills were submitted along with the objective of the questionnaire and definition of innovation to experts for eliciting their judgment for identification of Innovation Skills relevant to secondary level of learners. After doing analysis it was found that all skills (37) were selected. Out of the 37 Innovation Skills identified through expert ratings 20 top rated skills (having higher mean value) were selected for tool construction of Innovation Skills. The scores of the 20 skills ranged from 3.33-4.0.

For survey of Innovation Skills sample of N=130 was taken by purposive sampling, Percentage of scores attained by each student for the innovation skill test was calculated. On the basis of their percentage scores the students were classified into 4 groups- Highly Innovative, Above average, Average, Below average and Poor. It was found that 15 students out of 130 were found to be highly innovative. Followed by the survey of the status regarding Innovation Skills of IX class learners, need gap between desired and actual proficiency of Innovation Skills was identified .Skills having high need gap were- Problem Solving (2.11), Creative thinking (1.18), Improvement of Existing Products And Services (1.12), Flexible and Alternative Ways of Thinking (1.61), Converting Complex Ideas into Simple Ones(1.24), Adapting to Changing Situations (1.42), Using Appropriate Tools and Technology (1.36) and Manual Dexterity (1.29). A Programme for developing Innovation Skills was developed on the bases of need gap for every selected innovation skill. The objectives were defined on the basis of the skills with high need gap which were to be included in the programme. Programme objectives were: to develop among the students skills of Creative thinking , Improving existing products and services ,Problem solving, Flexible and alternative ways of thinking , Converting of complex ideas into simple ones , Adaptation to changing situation , Use of appropriate tool and technology , Manual dexterity, Synthesizing ideas.

The learning experiences are planned according to the Need Gap. These learning experience were activities which were planned in relation to the content in the science text book of class IX by Madhyamik Sikshaa Parishad U.P Allahabad. Some examples of planned activities related to some skill are as: 1. Creative Thinking a) Create a logo or symbol depicting water scarcity, pollution, save petrol, save earth and rain water harvesting. b) Give an alternative idea to come down instead of using steps or elevator. 2. Problem Solving- a) How to open a tight lid of a container? b) In how many ways can you separate cream from milk? 3. Improvement of Existing Products a) How can you develop a torch that not only show the way ahead on the stair case but also through light below so that the user and follower can see the steps below and behind. b) How can you develop a wheel chair convertible into Crutches so that it becomes easy to use it on stairs as well as on plane surface? The main resources required for developing these learning experience (activities) among secondary school learners were waste materials, models, internet, lab equipment, 3D printing facility, transformer toys and library. While preparing guideline for implementation and integration of the programme with the secondary school curriculum it was found that the IX class book (Vigyaan-Madhyamik Siksha Parishad) consists of 6 units and 25 sub units. The activities which are planned were mainly found to be related and integrated with 18 sub units. Some of the planned activities were found to be related with 1-5 units. The programme was given to 3 experts in order to judge the suitability of the planned activities in developing the respective innovation skill. Each activity was rated on a 4 point scale by experts. The activities having mean score above 2 were selected. After doing analysis it was found that 2 activities were rejected from skill Converting complex ideas into simple ones and some activities were slightly modified regarding language.

Try out of the programme was carried out on 38 science students of class IX. For tryout of the programme only few activities were selected due to shortage of time. These activities were related to skills of creative thinking, problem solving, Alternative ways of thinking, manual dexterity and synthesising ideas. Before the try out general class room equipment- chalk, duster, plane sheets, graph sheets were made available in the class room. All the activities were found to be relevant to the content of the Science text book by Madhyamik Sikshaa Parishad, Allahabad. Instructions of activities were clear to students and they did not find any difficulty in understanding the statement for activities. Time taken by students was different for each activity ranging from 5-15 minutes.

CONCLUSION

In the last few decades, innovation in general has been increasingly regarded as a crucial factor in maintaining competitiveness in a globalised economy (OECD, 2016). As Innovation is very important for the development and progress of our country Innovation skills should be necessarily integrate in the curriculum at very early stage. Teaching of innovation skills to school children is being recognized as an important component of the curriculum for the 21st century and some initiatives in this regard have already been taken by the National Innovation Council in southern India. This study has been taken up as an endeavour to design a programme to systematically integrate Innovation Skills in the Secondary School Curriculum. This is finally link to the programme of national development because it will create a pool of students to have the skills to develop new technologies and ideas thereby reducing our technological dependence on the West. It will also help to enhance the level of national productivity. In addition to this it will also help policy makers to modify their policy regarding integration of Innovation Skills in school programme at various levels of education. Curriculum planners may also get insight by the programme to integrate Innovation Skills in different subjects and levels of education. The educational institutes will also be able to contribute in the development of innovative students which are in great demand in every field. Along with this institutes will also be able to create/provide an atmosphere to foster young people's innovative skills. Programme will also encourage teachers to adapt new or innovative approaches of teaching and students to develop their innovation skills.

REFERENCES

[1] Adams, K. (2005). The sources of Innovation and Creativity. A paper commissioned by the National Centre on Education and the Economy for the new Commission on the skills of the American workforce. Retrieved from http:// www.fpspi.org/ pdf/ Innov Creativity.pdf

[2] Chell,E. and Athayde,R. (2009). The identification and measurement of innovative characteristics of young people. Research report National Endowment for Science, Technology and the Arts. Retrieved from https:// www.r esearchgate.net/ publication/ 38177990

[3] National Innovation Council, India (NInC 2010). Retrieved from http:// india.gov.in/ website-national-innovation-council

[4] OECD (2016), Innovating Education and Educating for Innovation: The Power of Digital Technologies and Skills, OECD Publishing, Paris. http:// dx.doi.org/ 10.1787/ 9789264265097-en