



EFFECT OF SOCIO-CONSTRUCTIVIST APPROACH OF TEACHING ON RESPONSIBLE ENVIRONMENTAL BEHAVIOUR IN RELATION TO INTELLIGENCE

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Abstract

The present paper discusses the effect of socio-constructivist approach of teaching on responsible environmental behaviour in relation to intelligence on the topics related to ecology for VII class curriculum. Teaching strategies using social constructivism as a referent include teaching in contexts that might be personally meaningful to students, negotiating taken-as-shared meanings with students, class discussion, small-group collaboration, and valuing meaningful activity over correct answers. This takes into account the social nature of both the local processes in collaborative learning and in the discussion of wider social collaboration in a given subject, such as science. The study employed an experimental method with pre- test – post -test design. Instructional material based on socio-constructivist based approach was prepared by investigator on the topics related to ecology from the prescribed VII class science text book. Coloured Progressive Matrics (1995) by Raven, Court and Raven was used to classify students into high, average and low Intelligent groups. The final sample consisted of 120 VII class students, 60 of which were in treatment group and 60 were in control group. Responsible environmental behaviour test was developed by the investigator to find out the responsible behaviour of students towards environment before and after the implementation of socio-constructivist based instructional material. The data was statistically analyzed using 2x3 ANOVA and it was concluded that group taught through socio-constructivist approach develop significantly better Responsible environmental behaviour than the group taught through Traditional Teaching Approach.

Key Words : *Socio-constructivism, Responsible Environmental Behaviour, Intelligence.*



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Constructivist perspectives on learning have become increasingly influential in the past twenty years and can be said to represent a paradigm shift in the epistemology of knowledge and theory of learning. The curriculum and evaluation standard for school education, National Curriculum Framework (NCF), prepared by working group of NCERT (2008), does also highlights the importance of introducing constructivist approach in education system. Constructivism is basically a theory -- based on observation and scientific study -- about how people learn.

Cognitive psychologist, Vygotsky (1986), shared many of Piaget's assumptions about how children learn, but he placed more emphasis on the social context of learning. In Vygotsky's theories both teachers and children play very important roles in learning. There is a great deal of overlap between cognitive constructivism and Vygotsky's social constructivist theory. However, Vygotsky's constructivist theory, which is often called socio-constructivism, has much more room for an active, involved teacher. Incorporating influences traditionally associated with sociology and anthropology, socio-constructivism emphasizes the impact of collaboration, and negotiation on thinking and learning. Especially relevant in this respect are the communication processes (learning dialogs) occurring in situations where at least two persons try to solve a problem. The social world of a learner includes the people that directly affect that person, including teachers, friends, students, administrators, and participants in all forms of activities. Teaching strategies using social constructivism as a referent include teaching in contexts that might be personally meaningful to students, negotiating taken-as-shared meanings with students, class discussion, small-group collaboration, and valuing meaningful activity over correct answers. This takes into account the social nature of both the local processes in collaborative learning and in the discussion of wider social collaboration in a given subject, such as science.

Eskelinen and haapasolo (2007), Haapasalo (2008), Panagiotis and Panagiotis (2008) and Kusumawati (2010) found collaborative learning as a powerful organizing principle in constructivist education as it was based on interaction between the student and his or her social environment. They described how social constructivism can be applied to encourage collaboration and cooperative work, which facilitates children's holistic development. Vygotsky (1978), Xu (2011) found a full range advantage of student discussion in socio-constructivist

classroom which allows students to generalize and transfer their knowledge of classroom learning and builds a strong foundation for communicating ideas orally through language. Increasing students' opportunity to talk with one another and discuss their ideas increases their ability to support their thinking, develop reasoning skills, and to argue their opinions persuasively and respectfully.

In linking the goals and principles of environmental education to constructivist learning theories Klein & Merritt (1994); Zhao (2003); Dillon (2003); Zandvliet (2007) found many similarities which suggested that students and teachers were actively engaged in constructing knowledge of the environment through their experiences rather than passively learning pre-determined knowledge. According to them constructivist teaching played an important part in teaching environmental science. They also found that students who learned concepts of environmental science using a constructivist approach were better able to recall information many months after the completion of a unit. In order for Environmental Education to be effective Hammitt and Freimund (1994) suggested the need to help in shifting the behaviour to be more environmentally mindful. Hines, Hungerford and Tomera (1987) believed whichever approach is used, the relationship of the individual action in regard to global issues must be central to the instruction if the desired outcome is that of responsible environmental behavior. Focus of the studies by Lee (2008) and Upham (2009) was to find out individual and social factors affecting responsible environmental behavior of citizens. Ramsey (1993), Yeung (2002), Adams (2003), Hsu (2004) evaluated the effectiveness of various instructional strategies for promoting environmentally responsible behaviour in learners.

Need of the Study

Down the years, there has been a massive expansion of the education system in India and qualitative improvements are visible too. We live in a fast moving technological society where the explosion of knowledge around us is a stark reality. Educational curricula and teaching methods are changing. One component of the current redevelopment of all subject area curricula is the change in the focus of instruction from the transmission curricula to transactional curricula. Education can no longer merely function as dispensers of information because there is far too much information to impart, and it is changing quickly as it is created. Education is a midst of a paradigm shift from an information processing explanation of learning to a constructivist approach of learning. According cognitive scientists, learning is a mental process and is to occur

by giving a meaning to knowledge reaching to mind. This basic idea agreed with the constructivist view of learning extensively accepted. This view suggested that persons could make sense of new phenomena encountered by using their existing prior knowledge and experiences (Duffy & Jonassen, 1991). For this reason, it is very important to provide students with learning environments in which students construct their concepts. This new approach requires teachers to act as a researcher in class environment and to actively participate in process of development and implementation of teaching program.

Further one might argue about ecological crisis which is really a crisis of maladaptive behaviour and not a technological problem (Newhouse, 1990). Because everyone lives in the natural and built environment, everyone has some knowledge of these environments. It has been recognized that the root of environmental problems is human behaviour. In order to solve environmental problems, it is necessary, beside the technical and scientific solution that everybody adopted a different behaviour towards environment. Developing a responsible environmental behaviour has become one of the tasks of science education. Environmental Educators agree that respect for the environment, the teaching of values as related to the environment and encouraging responsible environmental behaviour should be the integral parts of any Education curriculum. The pedagogical process, centered on teaching through Socio-Constructivist approach, set out to build in students more scientific notions. As well as, the Socio-Constructivist approach contributes to learn the students through the assistance of one-another

So, the investigator decided to study the effect of Socio-constructivist approach of teaching on responsible environmental behaviour in relation to intelligence.

Statement of the problem

EFFECT OF SOCIO-CONSTRUCTIVIST APPROACH OF TEACHING ON RESPONSIBLE ENVIRONMENTAL BEHAVIOUR IN RELATION TO INTELLIGENCE

Objectives Of The Study

1(a) To study whether groups of class VII students taught through Socio-Constructivist Approach and Traditional Teaching Approach differ in mean gain scores on variable of Responsible environmental behaviour.

1(b) To study whether class VII students with high, average and low intelligence differ in mean gain scores on variable of Responsible environmental behaviour .

1(c) To find if there is any interaction effect between teaching approaches and intelligence on Responsible environmental behaviour of class VII students .

Hypotheses

1(a). There exists no significant difference between groups of class VII students taught through Socio-Constructivist Approach and Traditional Teaching Approach in mean gain scores on Responsible environmental behaviour.

1(b). There exists no significant difference among high, average and low intelligent groups of class VII students in mean gain scores on Responsible environmental behaviour .

1(c). There exists no significant interaction between teaching approaches and intelligence of class VII students on Responsible environmental behaviour.

Delimitation:

1. The study was conducted only on 120 VII class students from English medium Government schools of Chandigarh affiliated to CBSE.

2. The Socio-Constructivist approach based instructional material was developed on some topics of science from the prescribed syllabus of NCERT/CBSE for Class VII.

6. The duration of the treatment was 40 working days.

Design Of The Study: In the present study, 2x3 factorial design was computed by ANOVA for the means gain scores on Responsible environmental behaviour. Here, instructional treatment and intelligence were the independent variables. Gain on Responsible environmental behaviour was the dependent variable which was calculated as the differences in post test scores and pre test scores for each subject. The variable of instructional treatment was studied at two levels namely experimental group (A1) which was taught by Socio-Constructivist Approach and control group (A2) which was taught by traditional Teaching methods. The variable intelligence was studied at three levels viz. High (I_1), Average (I_2), and Low (I_3) levels.

Tools: For the present investigation following tools were used

1) Instructional material for implementing Socio-Constructed Approach (Developed by investigator).

2) Test on Responsible environmental behaviour (developed by investigator). The test was consisted of 91 statements in eight dimensions. There were 37 multiple choice type items and 54 items in scale (34 positive and 20 negative). Scoring was done in two parts. Each multiple choice item carried four responses out of which only one was correct. One mark was assigned for

correct response and zero for incorrect. Scoring of the scale was based on a five point Likert type scale. Each item alternative was assigned a weightage ranging from 4 (to a greater extent/ strongly agree) to 0 (to no extent/ strongly disagree). In case of negative item scoring was reversed: 0 (to a greater extent/ strongly agree) to 4 (to no extent/ strongly disagree).

3) Coloured Progressive Matrices (1995) by Raven, Court and Raven.

Method and Procedure: Two main stages were adopted as procedure of experiment

Stage I Selection of the Sample: The present study was conducted on VII class students from the Government Model Senior Secondary school, sector – 16, Chandigarh and Government Model High School, Sector- 25, Chandigarh. After administering intelligence test to all 361 students, they were allocated to three groups viz. high intelligence, Average intelligence and low intelligence. The final sample comprised of 120 students which were selected through proportionate stratified random sampling technique where, 24 students with High Intelligence, 24 students with Low Intelligence and 72 students with Average Intelligence were selected from respective groups. Each of three groups of students was randomly allocated to two sub groups i.e. experimental and control group. Thus total six groups were formed. Each group comprised of five students, one of high intelligence, one of low intelligence and three of average intelligence. Selection of these students was done randomly.

Stage II: Conducting the Experiment: The experiment was conducted in three phases. In the first phase administration of Pre test i.e. Responsible environmental behaviour test, which was given to the students of experimental group and control group. Separate response sheets were provided. The answer sheets were scored with the help of scoring key. Socio-constructivist based instructional programme which was developed by investigator on some topics related to ecology from the prescribed NCERT text book of VII class students was conducted in second phase. It was executed for about 36 days which included 18 lessons to the experimental group whereas the control group was taught by the conventional method. Same content was taught to both the groups. Students were motivated to learn through the novel method of instruction and were encouraged to participate in the experiment by explaining the objectives. For experimental group each lesson follows the 5-E model where students encounter phenomena experimentally (Engage, Explore) prior to having general rules stated that help them articulate underlying principles (explain). Then the skill and new knowledge are transferred to new situations (Expand) and/or have their understanding enriched through additional experience. Student

readiness to make meaning of additional experience is assessed (Evaluation) before the cycle begins again. After the completion of instructional treatment of 36 days, in third phase, the subjects were assessed by administrating the post- test i.e. responsible behaviour test to students of both the experimental and control groups.

Statistical analysis

After having the basic assumptions underlying ANOVA satisfied, the calculations of 2x3 ANOVA were computed through SPSS package for testing the above mentioned null hypothesis. Following table shows the summary of 2x3 ANOVA for Mean gain scores on Responsible environmental behaviour.

Table: Summary of 2x3 ANOVA for Mean Gain Scores on Responsible Environmental Behaviour

Source of variation	Df	Sum of Squares (SS)	Mean Sum of Squares (MS)	F value	Level of Significance
Teaching Approaches (A)	1	32432.240	32432.240	489.761	S**
Intelligence (I)	2	1452.556	726.278	10.968	S**
AXI	2	329.222	164.611	2.486	NS
Error	114	7549.139	66.221		

* = Significant at .05 level of confidence

**= Significant at .01 level of confidence

NS = Not

significant

Results and discussion

The F-value of 32432.240 for the main effect of teaching approaches namely Socio-Constructivist approach and Traditional Teaching approach on responsible environmental behaviour was found to be significant at 0.01 level of confidence for 1/114 degrees of freedom. It shows that there is a significant difference in mean gain scores of the two groups. Hence, the hypothesis no.1 (a) is not accepted. As mean gain scores on responsible environmental behaviour of group taught through socio-constructivist approach is 50.166 and group taught through Traditional Teaching Approach is 11.083, it can be concluded that group taught through socio-constructivist approach has scored significantly more on responsible environmental behaviour than group taught through Traditional Teaching Approach. F-value of 1452.556 for main effect

of Intelligence on responsible environmental behaviour was found to be significant at 0.01 level for 2/114 degree of freedom. This significant F-ratio indicates that three groups of students namely High Intelligent, Average Intelligent and Low Intelligent have yielded significantly different mean gain scores on Responsible environmental behaviour. Hence the hypothesis no. 1(b) is not accepted. The present result can be justified with the findings of Kaur (2009), who found a significant difference among high, average and low intelligent groups of class v students on mean gain scores on Responsible Environmental Behaviour . So it is very much likely that significant differences in this study between mean gain scores on Responsible Environmental Behaviour is obtained due to different levels of intelligence. Further, interaction effect of Teaching approaches and Intelligence was found to be insignificant even at 0.05 level of confidence as F-value was 2.486 for 2/114 degree of freedom. This insignificant F-ratio indicates that there will be no significant interaction between Teaching Approaches and Intelligence on variable of Responsible Environmental Behaviour. Hence the hypothesis no. 3(c) is accepted.

The possible reason of above result could be that the socio-constructivist learning environment is designed to help social groups and individuals acquire an awareness and sensitivity to the total environment and its allied problems/issues. Socio-Constructivist approach is based on the principle of interactive pedagogical practices; interactive in the sense that learners must interact with sources of ideas/knowledge in social settings where learning takes place in a social environment and views learners as “active constructors of their own learning environment through activities like listing out the items packaged in reusable or recyclable containers out of a list containing items packaged in reusable or recyclable containers as well as non-reusable or non-recyclable containers, to sort out biodegradable and non- biodegradable products. Socio-constructivism thus emphasizes the importance of the learner being actively involved in the learning process, unlike lecture method where the responsibility rested with the instructor to teach and where the learner played a passive, receptive role. This thinking has largely been linked to the assumption that, if we make human beings more knowledgeable they will, in turn, become more aware of the environment and its problems and, thus, be more motivated to act toward the environment in more responsible ways. The activities which were included in Socio-Constructivist Approach is based on principle of ‘active construction of knowledge in social setting’ might have helped in developing a responsible behavior towards environment in the group taught through Socio-Constructivist.

Suggestions

This type of studies should be conducted in other topics and presented to teachers for their use. In addition, the teacher education institution must incorporate socio-constructivism in the training programme for the pre-service and in-service teachers. Other psychological variables like scientific temper, social skills, self esteem, motivation, home environment can be added in research endeavor which may possibly correlate the Responsible Environmental Behaviour. Relevant research results concerning student's conceptions should be communicated to teachers, and curriculum developers. Further, the present study focused on elementary school pupils. It can be repeated with different levels of education like at Secondary Level, College Level or University Level.

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