

## Effectiveness of Problem Based Learning over Lecture Based Learning on the Development of Environmental Ethics Among Secondary School Students

Dr. M. Shankar<sup>1\*</sup>

### ABSTRACT

One of the most important objectives of teaching Environmental Science in secondary schools is developing Environmental Ethics among students. But the objective of teaching Environmental Science is not realised properly. The major reason for this is poor methodology the teachers are following. By following conventional methodology, the Environmental Ethics is not developing among the secondary school students. Problem Based Learning is to be followed to develop Environmental Ethics. Therefore, investigator is interested to conduct the study to understand the Effectiveness of Problem Based Learning over Lecture Based Learning (Conventional Methodology) on the development of Environmental Ethics among Secondary School Students. The investigator used Environmental Ethics Tool for this study. Two groups with 40 students each were formed and one group is taught with Problem Based Learning and another group is taught with Lecture Based Learning approach. Data is collected, analysed and interpreted by using statistical techniques.

**Keywords:** *Environmental Ethics, Secondary School Students, Problem Based Learning and Lecture Based Learning*

Due to the unscientific activities of man, environmental degradation is taking place very rapidly. If it goes in this pace, shortly it is going to a situation where in organisms cannot survive on this earth. So, it is very urgent to develop environmental ethics among people especially among students. One of the objectives of teaching environmental science in secondary school is development of environmental ethics. In majority of the schools conventional methods of teaching is following. But the objectives of teaching environmental science are not realised properly because of the conventional methodology. Therefore, different experiential instructional strategies like problem-based learning, project-based learning etc. to be developed to teach environmental science in order to develop environmental ethics.

<sup>1</sup>Assistant Professor, University College of Education, Bangalore North University, Karnataka

\*Corresponding Author

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### ***Problem based learning***

Problem solving ability is the highest ability of an individual. This ability develops many thinking skills like, critical thinking, creative thinking, divergent thinking; logical thinking etc. and also decision-making capacity. Problem-based learning is a student-centered pedagogy in which students learn about a subject through the experience of problem solving. Students learn both thinking strategies and domain knowledge. The goals of Problem-based learning are to help the students develop flexible knowledge, effective problem-solving skills, self-directed learning, effective collaboration skills and intrinsic motivation.

Psychological research and theory suggest that by having students learn through the experience of solving problems, they can learn both content and thinking strategies. Problem-based learning is an instructional method in which students learn through facilitated problem solving. In Problem-based learning, student learning centres on a complex problem that does not have a single correct answer. Students work in collaborative groups to identify what they need to learn in order to solve a problem. They engage in self-directed learning (SDL) and then apply their new knowledge to the problem and reflect on what they learned and the effectiveness of the strategies employed. The teacher acts to facilitate the learning process rather than to provide knowledge.

Working in groups, students identify what they already know, what they need to know, and how and where to access new information that may lead to resolution of the problem. The role of the instructor is to facilitate learning by supporting, guiding, and monitoring the learning process. The tutor must build students' confidence to take on the problem, and encourage the students, while also stretching their understanding. Problem-based learning represents a paradigm shift from traditional teaching and learning philosophy, which is more often lecture-based. The constructs for teaching Problem-based learning are very different from traditional classroom/lecture teaching.

The use of Problem-based learning, like other student-centered pedagogies, has been motivated by recognition of the failures of traditional instruction and the emergence of deeper understandings of how people learn. Unlike traditional instruction, Problem-based learning actively engages the student in constructing knowledge. Problem-based learning includes problems that can be solved in many different ways and have more than one solution.

Problem-based learning can be used to enhance content knowledge while simultaneously fostering the development of communication, problem-solving, critical thinking, collaboration, and self-directed learning skills. PBL may position students in a simulated real world working and professional context which involves policy, process, and ethical problems that will need to be understood and resolved to some outcome. By working through a combination of learning strategies to discover the nature of a problem, understanding the constraints and options to its resolution, defining the input variables, and understanding the viewpoints involved, students learn to negotiate the complex sociological nature of the problem and how competing resolutions may inform decision-making.

### ***Lecture Based Learning***

Lecture method is one of the oldest methods used in classroom by teachers to impart knowledge to students. Teaching by lectures is probably one of the oldest methods used by classroom teachers. As a widely practiced method of teaching, a teacher can reach a large

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number of students at the same time; a large amount of materials can be covered in a short period of time. This is a 'teacher-centred' approach involving largely a one-way form of communication from teacher to students. The teacher, as the authoritative figure, does most of the writing and talking (chalk and talk) with the students as mere passive recipients of information-listening and writing down a few notes and asking few or no questions. The basic fundamental postulations of this type of method are that the teacher has knowledge, or can acquire knowledge, and that the teacher can give knowledge to students. The lecture method is considerably cheap to operate since no special teaching aids are required. It requires nominal planning. Its expository nature provides the teacher a feeling of security as the "influential figure" in the class. No matter how easy this method may appear, teachers must make efforts, to plan and organize their lecture to cover the subject matter to be presented and the manner in which it will be presented. In the introduction, the law teacher should identify the subject of the lecture and connect it with past lessons and try to stimulate interest on the subject matter. The body of the lecture should be presented in a logical order, building from what the students already know towards new knowledge that the teacher wants them to absorb. Knowledge is presented in small enough doses so that the students can absorb the material and at a slow enough pace. The pace however should not be too slow to make the students disinterested. Both the level of vocabulary used and the technical nature of the subject must correspond to the capability of the students. Teacher is more active and students are passive but he also uses question answers to keep them attentive in the class. It is used to motivate, clarify, expand and review the information. By changing his Voice, by impersonating characters, by shifting his posing, by using simple devices, a teacher can deliver lessons effectively, while delivering his lecture; a teacher can indicate by his facial expressions, gestures and tones the exact soul of meaning that he wishes to convey. Thus, we can say that when teacher takes help of a lengthy or short explanation in order to clarify his ideas or some fact that explanation is termed as lecture or lecture method. The primary advantage of a lecture is its ability to present a large number of facts in a short period of time but it is necessary that the students should accept and understand the subject matter to be presented. Lecture method makes fewer demands on the teacher's time for planning and preparing and is therefore an attractive and easy method of teaching. It is very useful in conveying factual information when introducing new topic.

### *Importance*

- **PBL is a multidisciplinary pedagogical approach that provides meaningful learning opportunities.** While Lecture based learning can certainly be content-specific, it also provides a vehicle for integrating multiple subjects. PBL encourages students to make meaningful connections across content areas, rather than thinking about each subject area in isolation.
- **PBL helps build 21st-century skills students need to succeed.** Students must be prepared to meet the demands of a global society. Students learning in a PBL setting are often more engaged in the learning process and develop a deeper understanding of the content and skills required for college, work, and life beyond school. PBL helps build 21st-century skills students need to succeed and develops students' capacity for critical thinking, communication, collaboration, and creativity, also known as the
- **PBL provides opportunities to engage students in real-world learning.** PBL is a great opportunity to engage students in authentic projects and/or activities tied to real-world careers and experiences. The real world tasks give students a deeper understanding of concepts through relevant and authentic learning experiences.

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- **Environmental Ethics:** ‘Environmental ethics is the responsibility to understand the environmental consequences of our consumption and need to recognize our individual and social responsibility to conserve natural resources and protect the earth for future generation.’

Adjusting the relationship between humans and nature is one of the most fundamental issues we face and must deal with today. With the increasing deterioration of ecological systems on which human beings rely and the aggravation of the environmental crisis, human beings have realized that we cannot rely on economic and judicial methods alone to solve the problems of environmental pollution and ecological imbalances; we must also appeal to human beings’ limitless internal ethical resources. Only after we have adopted an appropriate attitude towards nature and have established a new ethical relationship between human beings and nature will be able to love and respect nature automatically as well as conscientiously; and only with the guidance of such love and respect can we successfully deal with the issues of environmental pollution and ecological imbalances.

Environmental ethics is a new sub-discipline of philosophy that deals with the ethical problems surrounding environmental protection. It aims to provide ethical justification and moral motivation for the cause of global environmental protection. Ethics is social responsibility towards environment and Bio-Ethics is clarification of values in environmental ethics.

### *Designing of the study*

For the study two equal groups with 40 students were formed. The groups were equated by administering the intelligence test i.e Reven’s Progressive Matresis tool. To one group the concepts of environmental science were taught by following Problem based learning and other group by following Lecture based learning approach. Environmental Ethics Scale (EES) developed by the investigator is used to collect the data related to the Environmental Ethics among the students of the both the groups. Data is collected, analysed and interpreted by using statistical techniques.

### *Equating Groups*

#### **IQ scores of two groups**

Variable	Group	N	Mean	S.D	t	Sign
IQ Scores	Group with Problem based learning	40	52.3051	5.121	0.771	NS
	Group with Lecture based learning	40	52.4200	5.235		

From the above table it can be interpreted that the obtained ‘t’ value is 0.771 at 0.01 level of significance. Hence, it can be concluded that, there is no significant difference in IQ scores of groups indicating that both the groups are identical in nature by which homogeneity has been declared.

### **Scale used for the study**

#### ***Environmental Ethics Scale (EES)***

Environmental Ethics Scale (EES) is developed to measure the environmental ethics of secondary school students. The scale is developed to quantify the environmental ethics with the dimensions.

- Natural Resources
- Environmental Pollution

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- Energy Crisis
- Biosphere
- Environmental Protection

There are 60 statements with 4 points like strongly agree, agree, disagree and strongly disagree in the scale. A total of 32 statements are positively worded and 4 to 1 marks will be awarded for the response strongly agrees to strongly disagree. A total of 28 statements are negatively worded and 1 to 4 marks will be awarded for the response strongly agrees to strongly disagree. The scale has the maximum of 240 marks and the minimum of 1 mark.

### *Objectives*

- To understand effectiveness of Problem based learning approach in developing Environmental Ethics among secondary school students.
- To understand effectiveness of Lecture based learning approach in developing Environmental Ethics among secondary school students.
- To understand effectiveness of Problem based learning over Lecture based learning in developing Environmental Ethics among secondary school students.
- To follow different experiential instructional strategies for the development of environmental ethics among secondary school students.
- To develop environmental ethics among secondary school students.

### *Sample*

Sample includes 80 secondary school students from two equated groups (40 students from each group)

### *Administration of the Tool*

Environmental Ethics Scale (EES) developed by investigator is administered on sample of 80 secondary school students to test the Environmental Ethics.

### *Scoring*

The data related to environmental ethics is collected and analysed with t-test.

*Table showing Environmental Ethics of two groups*

Variable	Group	N	Mean	SD	SE <sub>m</sub>	t	Sig
Environmental Ethics	Group with Problem based learning	40	162.91	15.12	2.13	1.201	0.236
	Group with Lecture based learning	40	153.74	15.01	2.23		

From the table it can be interpreted that there is no significance difference in Environmental Ethics both the groups at 0.01 level of significance. Hence it can be concluded that, the mean scores of both the groups are the same inferring that both problem-based learning and lecture-based learning approaches are equally effective on the development of environmental ethics among secondary school students.

## **CONCLUSION**

From the study it can be concluded that both Problem based learning and Lecture based learning are equally effective on the development of environmental ethics among secondary

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school students. There is no chance to say one approach is better than the other approach among the two selected approaches. The reason may be that both Problem based learning and Lecture based learning child centred and activity centred approaches. Both are experiential instructional strategies. Both approaches make provisions to the students to constructs the knowledge by getting experiences. Learner will engage in the process of learning in both the approaches. These approaches develop problem solving ability, science process skills, co-operation, investigation, creativity, critical thinking etc. among students. Both approaches give an opportunity to learn by doing. Therefore, both Problem based learning and Lecture based learning can be used to develop environmental ethics among secondary school students instead of conventional methodology.

### REFERENCES

- Bryan, Norton, "Environmental Ethics and Weak Anthropocentrism". *Environmental Ethics* Vol.6, 1984, pp131-148.
- Dietz, T., P.C. Stern and G.A. Guagnano. 1998. "Social structural and social psychological bases of environmental concern. *Environment and Behavior*. 30:450-471.
- Duroy, Q. M., (2005). *The Determinants of Environmental Awareness and Behavior*. Rensselaer Working Paper in Economics 0501. Rensselaer Polytechnic Institute, Troy, NY. 25.
- Garrett, H. E., (1973). *Statistics in Psychology and Education*. Vakils, Feffer and Simons Publication Ltd., Bombay.
- Geller, E.S. 1995. "Integrating behaviorism and humanism for environmental protection." *Journal of Social Issues*. 51:179-195.
- Hans van Ginkel (2006) UNESCO Télé-Seminar Jakarta: Building a "Green Society":
- Lynne Taylor, et.el. *Improving the Effectiveness of Large Class Teaching in Law Degrees* University of Canterbury March 2012
- McCarthy, P. (1992). *Common Teaching Methods*. Retrieved July 24, 2008, From <http://hawaii.edu/intranet/committees/FacDevCom/guidebk/teachtip/comteach.htm>
- Petts, J, Herd A & O'Heocha, M 1998, Environmental Responsiveness, Individuals and Organizational Learning: SME Experience", *Journal of Environmental Planning and Management*, vol. 41, no. 6, pp. 711-730.
- Ron Miller (2006) *Green Money Journal* Vol. 14, No.2 (What is Education for? Four Essentials of Education for a Green Society)
- Scott, D. and F.K. Willits. 1994. "Environmental attitudes and behavior. A Pennsylvania Survey." *Environment and Behavior*, 26:239-260.
- The Role of Education.

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### Conflict of Interest

The author declared no conflict of interests.

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