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Effectiveness of Filed Work in Teaching Human Physiology at Senior Secondary Level

INTRODUCTION

Fieldwork is considered to be a major component within plant diversity, animal diversity, human physiology and environmental sciences curricula and is advocated as an effective learning environment. Kent *et al.* (1997) suggest that the objectives of any fieldwork exercise need to be clearly identified considering it as an educational exercise. In addition, the design of a fieldwork programme must be integrated into the structure and learning objectives. Fuller *et al*. (2000) consider the following to be key educational objectives of fieldwork(i)development of observational skills, (ii)facilitation of experiential learning, (iii) encouragement of student responsibility for their own learning, (iv) development of analytical skills, (v) provision of a taste of research, (vi) kindling of a respect for the environment, (vii) development of personal skills and (viii) lessening of barriers between staff and student.

Keeping these points in mind the researchersdesigned the fieldwork to see its effectiveness with the following aims and objectives.

Aim and Objectives of the Research

The aim of the present study was to know the effectiveness of fieldwork in teaching human physiology at senior secondary level. It also aim to ascertain whether students studying human physiology find fieldwork a valuable way of learning. The objectives were: (i)toknow the effectiveness of fieldwork in terms of developing various skills among students,(ii) to know the attitude of student towards field work. The research is contextualized by the need to ensure cost-effectiveness of the student learning and to ensure that such learning is also realistic, innovative, focused and relevant.

Population

All the standard XI English medium students with biology as the specialization of the schools in Gujarat affiliated to CBSE constituted as the population of the present study.

Sample

Non-Probability sampling design was adopted by the researcher for the present study. P. P. Savani Chaitanya Vidya Sankul, Surat, Gujarat, which is an English Medium CBSE school, was selected purposively. All 36students enrolled in standard XI Biology class constituted as the sample for the study. Of these 16 students were male and 20 students were female aged between 16 & 18 years.

The Experiment: Field Trip

The researchers identified the content of class XI CBSE, worth to be taught by organizing field trip. The Human Physiology Unit was selected for this study and field visits to different departments of Surat Municipal Institute of Medical Education &Researchat Surat was planned to facilitate the teaching learning process. Permission from authorities was takenand all necessary inputs were provided to students along with learning objectives. All 36 students ofclass XI with biology as their major subjectvisited the Institute and gained various skill related with human physiology for a period of one week.The students were accompanied with researchers and assistant laboratory in-charge of the school.

Tools for Data Collection

To achieve the objectives of the present study, a questionnaires and a reaction scale were constructed by the researcher.

Questionnaire was constructed to study the various skill gained by student during the fieldwork. Statements were aimed to know the benefits gained by the students related with fieldwork and to know whether they acquired the expected set of skills or not. The researcher has selected ten skills namely (i) observation skill, (ii) interpretation and identification skill, (iii) surveying skill; (iv) information gatheringskill, (v) data analysis skill, (vi) communication skill, (vii) data recording skill, (viii) measurement and sampling skill, (ix) advanced scientific methods skill and (x) safety skill.

A Likert type three point reaction scale was developed to assess the reaction of student towards fieldwork. It contained 10 statements. The three points of reaction were strongly agree, no response and disagree.

The constructed questionnaire and reaction scale were validated by ten experts in the field of education. Suggestions of experts were incorporated in the tools.

Data Collection and Data Analysis

The researchers administered the developed tools on the entire class XI student enrolled in Biology after completion of the field visit. All students were asked to complete the given questionnaire and give their responses.Students were also asked to give their reaction by putting a tick mark (√) in the appropriate box for each statement.

The researcher used quantitative data analysis techniques to analyse the data obtained by questionnaire and reaction Scale by frequency, percentageand intensity index.

Research Findings

Following findings were drawn from analysis and interpretation of the Data.

(A) Finding related to the Development of Skill:72.22% of the student felt that fieldwork experiences had enabled them to enhance their observation skill. 69.44% of the student felt that fieldwork experiences had enabled them to enhance their interpretation and identification skill. 72.22% of the student felt that fieldwork experiences had enabled them to enhance theirsurveying skill.83.33% of the student felt that fieldwork experiences had enabled them to enhance theirinformation gathering skill.55.56% of the student felt that fieldwork experiences had enabled them to enhance theirdata analysis skill.88.89% of the students felt that fieldwork experiences had enabled them to enhance theircommunication skill.88.89% of the student felt that fieldwork experiences had enabled them to enhance theirdata recording skill. 75% of the students felt that fieldwork experiences had enabled them to enhance theirmeasuring and sampling skill. (ix) 69.44% of the students felt that fieldwork experiences had enabled them to enhance their advanced scientific methods skill. 91.67% of the students felt that fieldwork experiences had enabled them to enhance their Safety skill.

(B) Finding related to Academic Benefits of Field work: All students felt that fieldwork was an effective way to learn human physiology as it helps to put theory into practice, provides hands-on experience, facilitates more effective learning, allowsone to gain confidence to perform practicalsand facilitates learning about the practical aspects of the subject.

(C) **Finding related to reaction of student towards field work:**In terms of reaction of students towards the statement i.e. “Field work helped me to develop key learning skills” 66.67 %, 13.89 %, and 19.44 % of them reacted agree, no response and disagree. The intensity index of 2.53 shows favourable reaction of the students towards the statement in developing the learning skills. In terms of the reaction of students’ towards the statement i.e. “Field work encouraged me to take responsibility for my own learning” 75 %, 11.11 %, and 13.89 % of them reacted agree, no response and disagree. The intensity index of 2.64 shows favourable reaction of the students as it encouraged them in taking responsibilities for their

own learning.In terms of reaction of students' towards the statement i.e. "Field work allowed me to study topics in depth" 77.78 %, 11.11 %, and 11.11 % of them reacted agree, no response and disagree. The intensity index of 2.67 shows favourable reaction of the students in developing habits to study any topic in depth.In terms of reaction of students' towards the statement i.e. "Field work allowed to develop more relaxed social contact with teacher; 88.89%" 2.78 % and 2.92 % of them reacted agree, no response and disagree. The intensity Index of 2.92 shows favourable reaction of the students towards free flow communication among students and teacher.In terms of reaction of student's towards the statement i.e. "Field work encouraged of my teamwork skills" 86.11 %, 2.78% and 2.83% of them reacted agree, no response and disagree. The intensity index of 2.83 shows favourable reaction of the students in developing skill of teamwork and teamspirit.In terms of reaction of students' towards the statement i.e. "Field work developed my curiosity about the human physiology" 88.89 %, 5.56 %, and 5.56 % of them reacted agree, no response and Disagree. The Intensity Index of 2.83 shows favourable reaction of the students in developing skill of curiosity about human physiology.In terms of reaction of student's towards the statement i.e. "Field work hadbeen undertaken at inappropriate times of the academic year" 25 %, 58.33 % and 16.67 % of them reacted agree, no response and Disagree. The intensity index of 1.67 shows neutral reaction of the students towards the arrangement of field work in the academic calendar. In terms of reaction of student's towards the statement i.e. "Field work had been of inappropriate length" 63.89 %, 22.22 %, and 13.89 % of them reacted agree, no response and Disagree. The intensity index of 2.42 shows the negative reaction related to the duration of field work and time management.In terms of reaction of student's towards the statement i.e. "Field work had been financially expensive" 36.11 %, 41.67 %, and 22.22 % of them reacted agree, no response and Disagree. The intensity index of 1.94shows their neutral reaction towards the statement.In terms of reaction of student's towards the statement i.e. "Field work involved too much travel and not enough activity" 30.56 %, 55.56 % and 13.89 % of them reacted agree, no response and Disagree. The intensity index of 1.72 showstheir neutral reaction towards the statement. The overall intensity index of 2.41 showed the positive reaction of students towards the field work.

Conclusion

It is clear from this research that there are a wide variety of things that students can learn from their fieldwork experience. These vary in range from the very practical ability to use equipment and the development of identification skills, through gaining a wider experience of the environment as a whole and thus being able to relate theory to practice, to the

accumulation of intellectual and personal skills. It is clear that the full ranges of the advantages of fieldwork are multifarious in nature. It would seem that fieldwork provides a very valuable learning experience. The findings of the present study also showed that the fieldwork to provide practical experience to Biology students in human physiology was effective in terms of the skill acquisition of students and their positive reaction towards the field work.

In conclusion, fieldwork provides students with a wide range of benefits that are difficult to quantify and measure. For all those involved with fieldwork it would seem that the benefits far outweigh the costs of running these courses. Therefore, it is strongly recommend that fieldwork should be given importance place in the school time-table for the practical subjects like Biology.

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