
Attitudes of Students towards Student Activities Given in High School Biological Science Text Books

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Science is one of those human activities that man has created to gratify certain human needs and desires. The search of truth became the dominant motive in the prosecution of science. Science is valued mostly for its practical advantages through it is also valued for gratifying disinterested curiosity and as an object of great aesthetic charm.

SCIENCE TEACHING:

There is of course one thing about which we feel no doubt or hesitation, education, science based and in coherence with indian culture and values can alone provide the foundation as also the instrument for the nation's progress security and welfare – indian education commission (1964 - 66).

In this era of science and technology the knowledge of science is very essential for all the human beings. All the aspects of human behaviour are governed by the basic knowledge of biology. The food we eat, the cleanliness and sanitation measures we follow, the healthy habits we inculcate, the agricultural methods we utilize, the industrial processes we develop are all based on application of scientific principles. The subject of science is valued the most for its practical application in the day – to – day life of the human beings. The teaching of science should equip and prepare an individual with certain values, attitudes and skills in science. A science teacher has to realize the aims of science teaching and inculcate the values of science in the pupils. The science policy resolution of the government of india (1958) stated “the dominating feature of the contemporary world is the intense cultivation of science on a large scale and its application to meet the country's requirements”.

The main aims of teaching biological sciences are

1. To provide a comprehensive knowledge of biological science
2. To develop skills and abilities to understand and utilize the processes and procedures in biological science
3. To develop an interest and appreciation on nature and environment
4. Developing scientific attitudes and training in scientific methods
5. Science as a basis for career development
6. To prepare students to be competent citizens of the society

SCIENCE TEACHING METHODS IN SECONDARY SCHOOL

The methods of teaching can be defined as a manner in which the teachers impart knowledge and skill by their teaching and students acquire it by learning. Method of teaching can be

understood as a way of teaching. It implies the style of content delivery in the classroom. The main aim of teaching is to bring about desirable behavioural changes in the students. Teachers who can create interest among the students and motivate them are considered as effective in this profession. There are different methods, approaches, and techniques which a teacher can employ to make classroom teaching interesting. A teacher should be familiar with all the methods in teaching and should also know the utilization of the right method at the right time. The selection and utilization of the correct method of teaching in a given situation depends on the efficiency of the teachers.

There is no royal road to learning but there are techniques of imparting and or effecting growth of pupils which are more efficient than other methods. A technique is mainly concerned with the classroom activities these techniques are relatively flexible and easy to implement, benefits derived from the development of more efficient methods and techniques.

The practice of teaching science in secondary school this plan and modifications of it have been the object of rather wide experimentation throughout the country. It purports to care for individual differences in large groups by means of study guides which permit individual progress according to the pupils' interest and abilities. It also provides for individual initiative and for enriched activities for the more capable pupils. In secondary schools science may be conceived as a series of group – planned related and unifying experiences or activities in which secondary pupils participate in order to achieve an adaptation, to or control over, an area of living the learning activities contribute to the understanding of significant and comprehensive principles which are functional in contemporary and ultimate living. These principles may be unified and integrated into a learning product such as “how to keep biologically fit,” the nature of the earth's crust and the like. This learning product is an integrated combination of skills, attitudes, habits, knowledge, appreciations and understandings which will effect an adjustment by the learner to life situation.

Exercises or activities are necessary for an organism to grow in any certain skill, habit, or attitude. This activity is continued until these abilities are mastered at least relatively so.
Science laboratories

Science teaching has now become less concerned in presenting factual knowledge or satisfying only knowledge aim. It is felt that only chalk and talk methods makes science an uninteresting subject moreover with theory only students are like frogs in a well, to tally unaware of experimental techniques. Experimental study is indispensable to create scientific method of thinking students facts become everlasting if pupils perform experimental themselves instead of memorizing like parrots. If good teacher is the first, laboratory is the second most important requirement.

Practical work serves as back bone for teaching all types of topics in the subject of science, therefore for proper success in this field, a well organized and a systematic procedure will have to be adapted. They are

1. Practical and theory side by side
2. Individual working

3. Detailed instructions must be given before starting the experiment.
4. The aim and purpose of the experiment should be made quite clear to the students. What they want find and how they can achieve it.
5. All the experiments along with diagrams and results must be completed in the laboratory.
6. Overcoming insufficiency of apparatus

Laboratory work out lined by the teachers were to verify facts taught in theory classes to develop habit of doing independent work among the students, to create interest in science, to prepare students for higher studies and ultimately to prepare students for higher studies and ultimately to prepare good scientists for the country, to develop skills of handling apparatus/equipments, to observe and critically think about results, to develop the habit of reasoning, to avoid memorizing the subject to create interest for research to have clear understanding of the concepts of the respective subjects and to find limitations and drawbacks in the theory portions and to develop habit of doing systematic work. The major unwritten work goal of laboratory work was however, to prepare students for practical examinations held externally. As many as half of the schools won prizes and certificated for distinctive work in science.

Science activities

In activities the student is given instructions that lead him through a procedure designed to produce certain specific results. At their worst such exercises are so involved with instructions and procedural details that the student loses track of what he was trying to proven even if he comes out at the end with a perfect result, structure laboratory exercises can be written that skill require the student to think about what he is doing. In well conceived structure activities the student is told how to gather the data and perhaps even how graph the data. However, the student does not know in advance what his results will be after he has gathered his data, certain leading questions may be asked to aid him in the direction of a reasonable analysis of the data and the desired generalization in the activities the student comes closest to following methods a scientist might use, and the possibilities for student discoveries are greatest activities can lead to the most exciting kinds of science experiences for both teacher and pupil.

Many junior high school, high school and even college students have never had the opportunity to handle laboratory apparatus; at least half of the class time should be spent on activities and laboratory exercises; while students are doing things, the likelihood of their learning something is greatest. One very highly activity oriented programmer know to taught in normal classroom equipped only with a few movable tables and very few of the 'essential' furnishings. Most people think of as requirement for a laboratory teacher pretests that a 45 minute period is not long enough for laboratory exercises. Yet with proper planning, exciting activities can be planned for a normal classroom and for a class period of normal length, useful activities may stretch over several days, professional scientists stretch experiments and investigations out over long periods of time and are often interrupted, but this does not prevent then from experimenting, the same is true for secondary school.

Structured laboratory activities on science topic include notes on planned pre – laboratory and post – laboratory discussion, necessary equipment and so forth. In general science, biology courses students have the opportunity to make field observations, field trips enable students to

integrate into a total picture what they know about isolated parts of their environment. Educators have recently shown much interest in the use of simulated situations to promote student interest and classroom participation a number of games used in science. Mathematics and other courses, games are being used more and more at all levels, from kindergarten to graduate level.

REVIEW OF LITERATURE

A brief review of related researches have been presented to get an insight into the present problem and also to have sound base to explain the phenomena in greater detail.

Jane Butler Kohle (1982) did a research work, on “opportunities for more classroom activities (or) community related science field – trip”, should be provided black minority pupils to develop scientific attitudes. Science teachers must be positive attitude towards science as a basis for achievement level in science.

Bhaskara Rao and Sundara Rao (1987) investigated on the topic “science text books in a pictorial representation and suggested activities”. Regarding the visual appeal of pictorial representations, it was interesting to note that the teachers reacted it was pleasure to look at the diagrams in text books. They expressed the opinion that they were somewhat helpful in learning. The photographic reproductions were large and clear, sufficient number of diagrams was drawn in text books. They points out that there were unnecessary diagrams and the diagrams were not adequately label and were not with clear captions. They further felt that the diagrams had no direct reference to the textual material.

Rajasekar and Sundara Rajan (1993) are designed to find out “the nature of relationship existing between the higher secondary biology students perceived biology classroom climate and their scientific interests”. Incidentally it is also intended to find out, if there is any significant difference in the scientific interests of the students when they are paired and any one pair of their sub – samples taken at a time for the purpose. It is found that the students perceived biology classroom climate and their scientific interest are significantly and positively related. Significant differences in the scientific interests are found only between the high group and the low group biology class room climate students when ever may be the combination tested and the sex of the students and the types of schools where they happen to study, by themselves alone, do not cause any significant difference in their scientific interests.

Gerberetal (1997) compared “the effects of science classroom teaching procedures non – inquiry versus inquiry on students scientific reasoning abilities”. The investigator found that the scientific reasoning ability of 8th grade students who received science instruction in inquiry based classroom was significantly higher than their counterparts who had not the differences. In achievement, for 8th 9th and 10th grade students were not significantly different.

Marlow Ediger (2001) in his article “assisting pupils in reading science subject matter”, the science teacher has an important responsibility in guiding pupils to read content in science meaningfully. He / she needs to assist pupils to comprehended subject mater and make use of this information in variety of ways. Much time is wasted in learning if pupils do not understand

what has been read. Reading is a major means of obtaining knowledge in science. Reading is necessary together information to solve problems in science. The content obtained must reflect higher levels of cognition, such as critical and creative thinking in order to be useful in the problem solving area.

Jain (2002) also stated in his paper “teaching science through analogical reasoning enhances students learning through constructivist path”. The use of analogical reasoning has an important cognitive role to play in bringing out conceptual changes amongst the students choice of analogy is of prime importance. There are different theoretical perspectives firstly; the students may require replacement or reorganization of existing concepts, in such case the process may be termed as accommodation. In other cases existing concepts may be sufficient to deal with new phenomena. This process may be called as assimilation.

Tripathy Bhubaneswar (2004) started in his research paper ‘co-operative learning a new strategy for teaching science’, where a large number of children have to handled, they can taught with the help of co-operative learning, in which students help watch others learn. This strategy of group learning can be adopted for teaching topics, which are adopted descriptive in nature, easy for students to comprehend and can be adopted by performing simple activities. Co-operative learning ensures students co-operation rather than competition her students of competing with one another. Thus students develop more positive attitude towards a subject area than through competitive learning.

Bhaskar, Patankar and Padmini (2005) conducted a study on ‘concept mapping – a new technique for science education’ and stated that the hierarchical structure for a particular domain of knowledge depends on the content in which the knowledge is being applied on considered the author emphasizes that it is construct concept maps with reference to the question that we seek to answer through the organization of knowledge in the form of concept maps.

PRESENT STUDY

The present study is identifying the various activities present in biological science text books of viii, ix and x classes. In general, teachers and students may not know the various activities that can be identified through the biological science text book. So this study helps the investigator to know, how for the various activities are identified by the students through the science text books.

NEED FOR THE STUDY

It is an imperative need in the present context of things that the whole of educational system should be so reconstructed as to include activity education as an implicit aspect of the same. Activities should be integrated properly with different subject areas and educational programmes. So, the study is needed to know how much activity oriented education is being imparted to the students through the biological science text book and it also enables the students to recognize the utility of these activities in real life situations.

STATEMENT OF THE PROBLEM

As such the present investigation was designed to study the “attitudes of students towards student activities given in high school biological science text books”.

OBJECTIVES OF THE STUDY

The following objectives are formed for the purpose of study

1. To identify the attitude of students on various experiments which are performed in the biological science text book
2. To examine the level of identification by the students about the student activities in biological science text book
3. To find the identification difference between boys and girls on students activities in the biological science text book
4. To evaluate the activity identification between the different types of school students on students activities in the biological science text book
5. To find the identification difference between the school students on student activities with regard to their class

HYPOTHESES FOR THE STUDY

Based on the above objectives the following hypotheses were formulated for the investigation.

1. There is no significant difference between the students on different students activities given in the biological science text book
2. There is no significant difference between the students in level of identification about the student activities with regard to sex, type of school and class.

TOOLS USED IN THE STUDY

The following instruments were used for the present study

1. The opinionative scale of the students on student's activities given in biological science TEXT books of viii, ix and x class
2. Personal data sheet

SAMPLE FRAME

For the present study, the investigator selected randomly 100 students keeping the various variables like gender, class, and school had collected the data from 12 high schools (namely govt. High schools, Zilla Parishad high schools, Andhra Pradesh Social Welfare Residential Schools (APSWRS) and private high schools) in and around of Nalgonda district.

ANALYSIS

The collected data was analysed basis on the objectives of the study and hypotheses formulated, by employing statistical techniques namely frequencies, percentages and χ^2 test.

A. The Opinion of the Students on Students Activity Questionnaire

To knowing the opinion of the students towards the students activities in the given biological science text books of class 8th, 9th, 10th, the investigator applied the χ^2 test for testing the significance between the ratings they opted. The calculated results are given in table-1.

Table-1: frequencies under different categories of students opinion on the students activity test and the values of chi-square.

S.no.	Attitude		Rating of the attitude					X ²	Value of sig.
	Yes	No	Sa	A	Ud	D	Sd		
1	150	30	40	35	25	30	20	21.25	0.01
2	142	36	32	30	28	25	27	17.6	0.01
3	132	48	45	35	27	29	16	8.6	@
4	140	40	55	37	25	13	10	18.95	0.01
5	126	54	45	30	37	10	4	19.55	0.01
6	125	55	55	20	25	15	10	23.55	0.01
7	118	62	40	23	21	20	14	13.45	0.01
8	128	52	35	30	25	19	19	15.15	0.01
9	136	44	38	31	28	24	15	13.55	0.01
10	140	40	42	28	32	20	18	13.8	0.01
11	129	51	40	30	26	19	14	14.95	0.01
12	135	45	25	28	33	35	14	4.25	@
13	141	39	27	30	42	27	15	5.4	@
14	123	57	30	40	18	16	19	19.05	0.01
15	109	71	40	20	25	17	7	12.05	0.05
16	113	67	40	30	22	9	12	13.8	0.01
17	115	65	40	21	30	14	10	20.95	0.01
18	106	74	35	33	24	10	4	16.95	0.01
19	118	62	35	26	27	10	10	22.5	0.01
20	127	56	37	29	32	21	8	8.75	@
21	130	50	45	40	30	10	5	16.25	0.01
22	142	38	52	25	29	18	18	14.2	0.01
23	136	44	36	30	28	25	17	3	@
24	125	55	42	24	27	14	18	6.8	@
25	117	53	30	30	27	10	20	2.05	@
26	110	60	47	30	19	8	6	9.975	0.05
27	108	72	18	20	35	30	15	0.85	@
28	98	82	22	20	27	15	14	2.9	@
29	126	54	25	29	37	30	5	4.65	@
30	119	61	20	23	27	40	10	3.8	@
31	138	42	30	35	29	23	21	6.55	@
32	142	38	40	36	40	16	10	6.8	@
33	118	52	27	25	30	22	14	5.05	@

34	107	72	20	24	27	25	11	7.85	@
35	126	54	30	25	34	24	13	5	@
36	129	51	27	24	39	28	13	6.45	@
37	136	44	20	27	32	26	31	7.45	@
38	140	40	19	20	27	36	38	3.4	@
39	118	62	17	25	30	27	19	4	@
40	156	24	27	29	35	30	35	5.3	@
41	133	47	25	20	18	26	44	7.8	@
42	144	36	23	27	30	42	22	7.35	@
43	111	69	15	19	25	31	21	2.2	@
44	120	60	20	25	31	18	26	2.85	@
45	110	70	15	21	26	25	23	1.65	@
46	125	55	22	27	26	30	20	2.35	@
47	160	20	23	29	37	24	49	1.8	@
48	153	27	21	29	35	32	36	5.05	@
49	148	32	25	27	37	31	28	1.8	@
50	135	45	17	22	29	35	32	8.35	@
51	129	51	19	27	35	27	21	4.2	@

@ not significant at 0.05 level

From table-1 it is revealed that most of the students are positively responded towards the student activities that they performed under the guidance of their teachers. When testing the rating of the activities most of the activities are favourable opinioned and significant. Among the all activities 6th, 19th & 1st are opinioned by the students with 1st, 2nd and 3rd ranks based on the χ^2 value.

B. Opinion of the boys and girls on student activities in the biological science text books of viii, IX and x class

To identify the difference between boys and girls on the students' activities questionnaire, the researcher used χ^2 test. The computed results are given in table-2.

Table-2: percentages and chi-square values of boys and girls on students activity

S.No.	Boys		Girls		X ² value
	Yes	%	Yes	%	
1	60	63.8	30	34.88	2.25
2	55	58.5	47	54.65	7.6
3	47	5.0	45	52.32	8.6
4	44	46.8	62	72.09	8.95
5	54	57.4	65	75.58	3.55
6	70	74.4	50	58.13	3.55
7	65	69.1	50	58.13	3.45
8	64	68.0	49	56.97	5.15
9	70	74.4	50	58.13	3.55
10	60	63.8	50	58.13	3.8

11	72	76.5	30	34.88	4.95
12	40	42.5	46	53.48	4.25
13	52	55.3	40	46.51	5.4
14	35	37.2	84	97.67	7.05
15	50	53.1	45	52.32	4.05
16	54	57.4	60	69.97	6.8
17	50	53.1	45	52.32	2.95
18	45	47.8	70	81.39	5.95
19	55	58.5	45	52.32	2.5
20	50	53.1	40	46.51	8.75
21	70	74.4	45	52.32	6.25
22	55	58.5	35	40.61	4.2
23	35	37.2	47	54.65	3
24	59	62.7	40	46.51	6.8
25	44	46.8	43	5.0	2.05
26	45	47.8	43	5.0	9.975
27	39	41.4	42	48.83	0.85
28	40	42.4	43	5.0	2.9
29	39	41.4	70	81.39	4.65
30	65	69.1	35	40.61	8.8
31	54	57.4	65	75.58	4.55
32	65	69.1	51	59.30	9.8
33	65	69.1	46	53.48	5.05
34	45	47.8	44	51.16	7.85
35	62	65.9	54	62.79	5
36	60	63.8	61	70.93	9.45
37	50	53.1	53	61.62	7.45
38	35	37.2	43	5.0	9.4
39	45	47.8	45	52.32	4
40	49	52.12	35	40.69	5.3
41	59	62.76	45	52.32	7.8
42	64	68.08	64	74.44	7.35
43	60	63.82	40	46.51	4.2
44	55	58.51	37	43.02	3.85
45	50	53.19	30	34.85	1.65
46	60	53.82	42	48.83	5.35
47	59	62.76	55	63.95	6.8
48	66	70.21	65	75.55	5.05
49	59	62.76	45	52.32	7.8
50	64	68.08	64	74.44	7.35
51	60	63.82	40	46.51	2.2

From table-2 it is observed that there is no difference between the boys and girls in their opinion towards student activities given in secondary school biological science text book. When testing their rating the χ^2 values are also shows that there is a positive opinion towards the activities. There is no comparison between boys and girls in the ranking order of the activities which were given in science text books.

C. Opinion of the different class students on students’ activities of the biological science text books.

To knowing the identification of the student activities by the 8th, 9th and 10th class students, the investigator applied the χ^2 test. The calculated results are given in table-3.

Table-3: The number of different class students opinioned positive and the values of chi-square

S.no.	Viii	Ix	X	X ²
	Yes	Yes	Yes	
1	54	52	52	3.33
2	43	43	43	10.8
3	52	39	39	2.53
4	41	43	43	6.13
5	52	43	49	6.13
6	43	52	56	6.13
7	39	41	48	1.2
8	43	54	56	6.13
9	49	46	48	9.45
10	56	52	54	7.45
11	48	47	46	9.4
12	56	41	52	4
13	48	56	47	5.3
14	53	48	41	7.8
15	46	57	56	7.35
16	35	42	48	4.2
17	54	36	57	3.85
18	46	41	42	1.65
19	52	58	36	5.35
20	47	36	47	6.8
21	41	46	41	9.45
22	56	40	56	7.45
23	48	29	48	9.45
24	57	38	57	7.45
25	42	48	42	9.4
26	48	29	48	4

27	38	27	38	5.3
28	26	41	56	7.8
29	34	56	40	7.35
30	36	40	27	4.2
31	38	27	35	3.85
32	35	35	51	1.65
33	39	51	47	5.35
34	46	47	56	6.8
35	54	56	33	2.33
36	37	33	45	2.53
37	45	45	36	3.33
38	57	36	54	4.33
39	46	54	42	9.45
40	38	42	32	7.45
41	48	32	55	9.4
42	50	55	36	4
43	39	51	38	5.3
44	29	48	35	7.8
45	30	37	39	7.35
46	46	34	46	4.2
47	26	44	54	3.85
48	26	48	42	1.65
49	38	52	32	5.35
50	44	36	55	6.8
51	45	45	51	3.33

From table-3 it revealed that there is a positive opinion between the students of class 8th, 9th & 10th students. Nearly 50% of the students are positively responded that they are engaged with student activities either in the classroom or at the outside of the classroom. Based on the χ^2 value the students ranked 9th, 20th, 23rd and 39th activities are similar response.

D. The percentages of different school students on student activity

To knowing the opinion of the students studying in the different school towards the activities which are given in biological science text books, the investigator used the frequencies and percentages of their opinion for each and every item. The results are showed in table-4.

Table-4: Percentages of Different School Students on Students Activity

S.no.	Students (yes)			
	GHS	ZPHS	APSWRS	PRIVATE
1	25	30	29	28

2	35	21	15	19
3	28	22	27	35
4	36	29	18	31
5	25	24	16	30
6	30	25	25	30
7	35	25	35	21
8	28	35	28	22
9	21	15	36	29
10	22	27	25	30
11	29	18	35	21
12	24	16	28	22
13	25	24	25	30
14	25	26	35	21
15	25	30	28	22
16	35	21	36	29
17	28	22	21	15
18	36	29	22	27
19	18	35	29	18
20	16	28	24	16
21	24	25	25	24
22	26	35	21	36
23	30	28	22	21
24	21	36	29	22
25	22	21	35	29
26	28	28	28	24
27	36	36	36	25
28	25	25	25	21
29	35	35	35	22
30	28	28	28	29
31	25	25	25	24
32	28	24	25	25
33	25	26	35	21
34	35	30	28	22
35	28	28	28	28
36	28	36	36	36
37	36	25	25	25
38	25	35	35	35
39	35	28	28	28
40	28	25	25	25
41	25	28	24	25
42	35	25	26	35
43	35	25	35	25
44	28	35	28	35

45	21	15	36	28
46	22	27	25	36
47	29	18	35	18
48	24	16	28	16
49	25	24	25	24
50	25	26	35	26
51	28	36	36	36

It is observed from table-4, 80% of the students are responded positively towards the students activity. There is no difference between the students of different schools mainly GHS, ZPHS, APSWRS and private schools. The present study intended to come across its objectives. Therefore it concludes that all the types of school students are involved in students activities during their academic works either in or outside of the classroom.

MAJOR FINDINGS AND CONCLUSIONS

From the results of this investigation, the following findings and conclusions are drawn.

1. On overall the opinion of the students towards the student activities are favourable.
2. The activities namely preparation of herbarium. Scrap book, root pressure demonstration, milk pasteurization, renewable resources, bio-gas preparation, preparation of manures, observation of dissection etc., activities which are developed the scientific skills and knowledge of the content which was given in the text books. They opts model of virus with clay, reflective arch, and scrap book of scientists ranked first, second, and third order of all the student activities.
3. Boys and girls did not differ in the opinion towards the students activities.
4. The students of different classes are also opinioned favourable towards the students activities.
5. The students of different schools are also not differs in their opinion towards the activity in biological science text books.
6. On over all, the biological science text book promotes maximum activities among the high school students.
7. Principle of continuity should be maintained in secondary school biological science syllabus.
8. Opportunities are to be provided for the students to think scientifically so that they can solve problems and understand theorems, proofs on their own.
9. It is better to use appropriate teaching aid in the class.

RECOMMENDATIONS

From the above conclusions, the following recommendations were defined

1. It is observed that the students have higher level of activity identification. The schools which are pay attention to demonstration, activity instruction and experiments for the students they only opinioned positively to the students activities.
2. Boys and girls have equal amount of favourable opinion towards the activity identification. Hence there is no difference in identification of activities among boys and girls.
3. Students studying in different class are also having the same level of activity identification. Therefore necessary steps should be taken to promote the sense of reasoning, problem solving abilities and divergent thinking, scientific attitudes among the students.
4. The results show that the biological science text book promotes maximum number of activities among the students. The laboratory and library facilities are improved to high school level with that knowledge of science can be easily acquired by the students.
5. Authorities and some of the non-government organizations are also provide necessary equipment to the schools, with that the student activities, and teachers activities possible to conduct successfully. Besides the library facilities are also inculcated by the students.

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