

An analysis of the perceptions of teachers on science teaching

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Background

Science has been made a compulsory subject at junior secondary level and senior secondary level ending at G.C.E ordinary level, considering the educational value of science for all citizens. Science is taught to provide scientific literacy to all students, who do not have opportunity to learn science after ordinary level, due to selection of other streams, or terminate their formal education after ordinary level. On the other hand curriculum should cater to lay foundation for higher education in science streams at higher levels. Due to these reasons the curriculum has to cover the life needs and higher educational needs at the compulsory education period. To address these, teachers should have a thorough understanding of the nature of science. Science is a subject in which contains accumulated knowledge as well as the process of acquiring knowledge. The influence of science is essential to all the citizens.

Considering the aspects related to these perceptions science educationist has identified the process based science teaching instead of product based science teaching. Today they recommend beyond process science teaching in which not only the process of science with the product of science is emphasized but also the influence of science is targeted. There are various ends of science teaching;

- Integration of science vs. specialization of sciences
- Product based science teaching vs. process based science teaching.
- Cognitive and affective.

Breadth and balance have to be maintained in a curriculum (Parkinson.1994). Therefore the teacher perception is very much important in achieving the purpose of science teaching.

It is observed that the purpose of science teaching is less achieved than the expected level. There are many folds among which are teacher related reasons. One is the teaching process which is determined by the perception of the teacher. This inquiry aims to analyze the teacher perceptions on science teaching. The research inquired whether the teachers are in favour of teaching the process of science or

product content of science and also about teaching separated sciences such as Physics, Chemistry and Biology or integrated science.

Objectives

- To identify the attitude of teachers on teaching the processes of science and the content (Product) of science
- To identify the attitude of teachers on teaching integrated science and separated sciences
- To identify where the teachers stand within the extremes of science teaching
- To identify the diversity of teachers on the perception and awareness of science teaching

Methodology

As the research need is to inquire attitudes of teachers, descriptive survey method was employed in this study. The study was limited to Gampaha zone. The population consists of teachers, from type 1AB, and 1C schools. The teachers consist of trained graduates, non trained graduates and trained teachers.

Teachers were selected using stratified random Sampling was selected. Teachers in number 51 of four 1AB schools and five 1C schools were used as the sample. Questionnaires and focused group discussions were used in this study.

Questionnaire consists of 20 statements in Likert scale was given to teachers. Four aspects of attitude were examined by the statements. There were the attitude towards Teaching the process of science (P), Teaching the Factual content of science(C), Teaching separated sciences(S), Teaching science as integrated science(I)

The scale ranged from +2 to -2, and therefore the Total marks are within the range +12to -12 for P &S, +10 to 10 for I &C. In the analysis means and standard deviations were calculated. (P-C) and (I-S) were calculated. (P-C) is Positive when processed based science teaching is preferred than content based science teaching. (I-S) is positive When integrated science teaching is preferred than separated sciences

Outcomes

The means and standard deviations (SD) of scores obtained from the teachers for process teaching (mean5.62, SD 2.67) show that they feel process teaching is more important. The mean scores show that the opinion, "content teaching is more important" is negative (mean-0.21, SD2.36) (see Table 1). The

opinion does not change with school type or teacher qualifications. Similarly integrated teaching at compulsory education period is preferred rather than teaching specific subjects chemistry physics and, biology. Mean score for integrated science is 2.70 and S.D. is 3.01 while those for separated science are 0.21 and 2.36 respectively. Means and standard deviations of scores according to school type or with qualifications do not show differences. The Scatter graph shows that preference spread in the, quadrant process based and integrated approach (see Figure 1) and not in the quadrants content integrated and content separated sciences. Discussions with teachers also verify the same opinion.

Tables and diagrams

Table 1. Means and standard deviations of scores(P,S,I&C) according school type

type	mean/SD	Means and standard deviations					
		P	S	I	C	P-C	I-S
1ab	Mean	5.18	-1.07	2.28	-0.07	5.25	3.36
	SD	2.76	3.83	3.29	2.42	2.64	5.50
1c	Mean	6.17	-1.30	3.22	-0.39	6.56	4.52
	SD	2.52	3.45	2.63	2.33	3.38	4.93
All	Mean	5.63	-1.18	2.70	-0.21	5.847	3.88
	SD	2.67	3.63	3.01	2.36	3.04	5.23

Table 2. Means and standard deviations of scores according to professional Qualifications

prof:Qual		Means and standard deviations					
		P	S	I	C	P-C	I-S
pgde	Mean	5.2	-3.13	3.6	-0.93	6.13	6.73
	SD	2.81	3.98	3.02	2.34	2.41	5.47
Dip/Tea	Mean	6.2	-0.93	2.2	-0.93	7.13	3.13
	SD	2.65	2.99	3.14	2.37	3.27	5.27
Train	Mean	5.4	-0.4	2.2	0.46	4.93	2.6
	SD	2.64	3.56	3.10	2.16	3.01	4.88
All	Mean	5.63	-1.18	2.70	-0.21	5.84	3.88
	SD	2.67	3.63	3.01	2.36	3.04	5.23

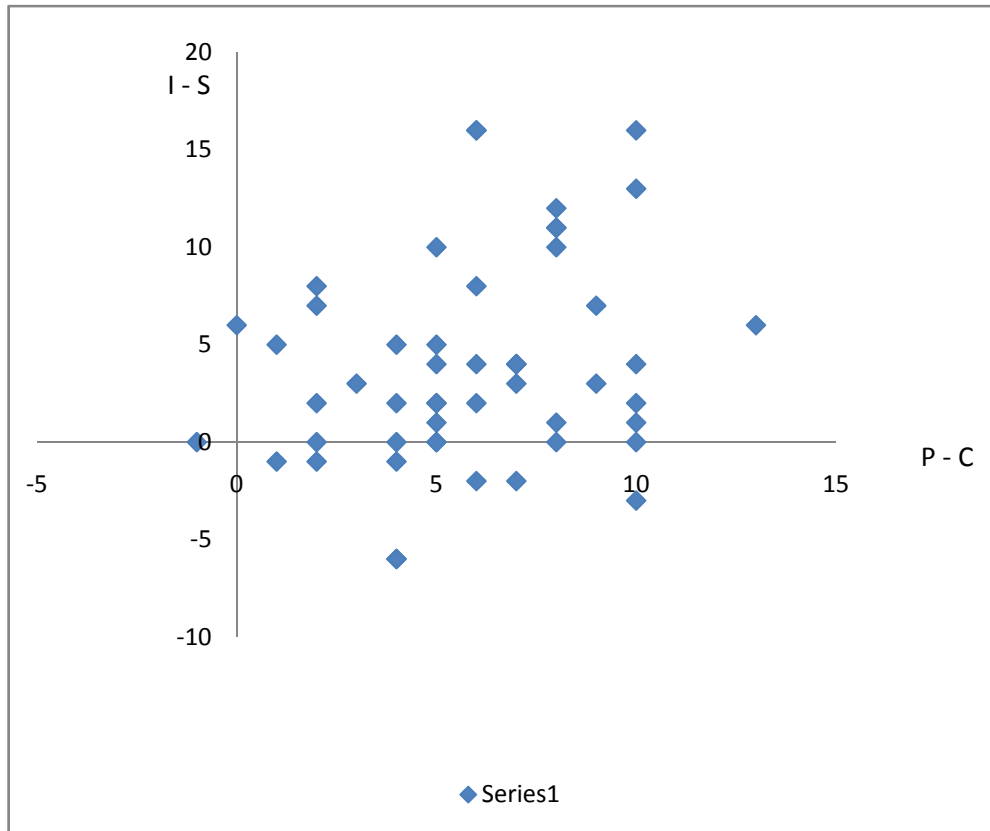


Figure 1. The preference of teacher about teaching types (process, integrated, specialized, and content)

Conclusion and suggestions

The preference of teachers on science teaching at compulsory education is towards process based science teaching. They are of the opinion that teaching the process is more important than the content or the product of science. Similarly they prefer integrated science teaching than separated sciences teaching at compulsory education period. Inquiries have to be done about their competencies. Teacher awareness about science education has to be strengthened more.

References

Parkinson, John. (1994) *The Effective Teaching of Secondary Science*. London and New York: Longman