

CRITICAL STUDY OF CURRICULUM COMPARISON BETWEEN DIFFERENT BOARDS EXISTING IN WEST BENGAL IN RELATION TO LIFE SCIENCE AT HIGHER SECONDARY LEVEL

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ABSTRACT:

The objectives of this study were to analyse and compare life science curriculum of higher secondary level between WBCHSE and CBSE, to know which curriculum is more effective and child-centric, to ease the decision making process of those parents who are anxious about their children in case of science education. A comparison has been made between WBCHSE and CBSE higher secondary life science curriculum. A comparative study has been conducted among higher secondary life science school teachers of both to fulfill the needs. Self-administered questionnaire covering curriculum transaction, evaluation process and relationship between practical work and theoretical part, were distributed among higher secondary school teachers of life science of both boards. All the data were analysed using t-test through SPSS software. It was found that there is no such difference between WBCHSE and CBSE higher secondary life science curriculum but in case of curriculum transaction, content coverage, practical work, evaluation process.

KEYWORDS: Comparative study, higher secondary, life science, questionnaire, curriculum transaction, content coverage, evaluation.

INTRODUCTION:

Curriculum, Latin origin, means to run a course. A curriculum is perspective & is based on a more general syllabus which merely specifies what topics must be understood & to what level to achieve a particular grade or standard. A curriculum may be partly or entirely determined by an external, authoritative body like NCF. Curriculum, is a series of experiences undergone by learners in a school, means everything, including extra class activities, guidance & interpersonal relationship. Curriculum development is a process of improving the curriculum by using various approaches like analysis, design, selecting, formation & review. NCF (2005) proposes five guiding principles for development:

- Connecting knowledge to life outside the school
- Ensuring that learning shifts away from rote methods
- Enriching the curriculum beyond textbooks
- Making exams more flexible & integrating them with classroom life
- Nurturing an overriding identify informed by caring concerns within the democratic policy of the country.

NCF emphasizes on four major areas of school curriculum i.e. language, mathematics, science & social science to make education more relevant to the present day & future needs. So that children can get a taste of integrated knowledge & joy of understanding. Numerous reports have called for a rethinking & restructuring of H.S/undergraduate science education to make it more relevant & accessible to a broader spectrum of students. In 2009, several important Publications, conferences & events have pointed toward confluence around more interdisciplinary & interconnected approaches & themes for undergraduate education in the life sciences. Central Board of Secondary Education is one of the oldest and largest boards in school education in India, established in 1929. It has more than 16,000 affiliated schools in India & 24 other countries of the world. The board is committed to provide stress-free learning environment and evaluation procedure.

This study is to analyse & compare the curriculum of between WBCHSE & CBSE.

STATEMENT OF THE PROBLEM:

Governments compare their states' curriculum when searching for new initiatives & when attempting to enhance international competitiveness. Parents also compare the institutions of different boards in order to choose the suitable one for their children. There is always a contradiction in between. When we have no option we do it better, but when there is an option we always run

for the better one for our welfare. So, in this race, which one is better curriculum at life science for a student either CBSE or WBCHSE? A critical study on it.

OBJECTIVES OF THE STUDY:

The objectives of the present study have been focused on following aspects:

1. To analyse & compare the life science curriculum between WBCHSE & CBSE.
2. To know which one is more stress free, child-centered, holistic education without compromising on quality.

HYPOTHESES OF THE STUDY:

H₀1- There is no difference between WBCHSE & CBSE life science curriculum.

H₀2- There is no differences of stressfulness between WBCHSE and CBSE life science curriculum.

DELIMITATION OF THIS RESEARCH:

This research is carried out in West Bengal. Higher secondary life science curriculum of CBSE & WB are taken to study & compare. There are many aspects of curriculum study but here I am taking contents to analyse.

To run this study-

- Students from CBSE & WBCHSE affiliated schools of class XI & XII are selected (one section of each class) here.
- Life science of class XI & XII is taken here. One chapter from each class is selected here for assessment.

POPULATION AND SAMPLING:

- **Population:** The higher secondary life science school teachers of WBCHSE and CBSE in West Bengal.
- **Sample and sampling:** All the life science teachers are taken randomly as samples. 30 higher secondary life science school teachers of both boards, 15 teachers are from WBCHSE and another 15 are from CBSE.

VARIABLES:

- **Independent variable:** WBCHSE life science curriculum and CBSE life science curriculum.
- **Dependent variable:** Stressfulness of life science curriculum.
- **Moderator variable:** Level of Intelligence of secondary school teachers.
- **Extraneous variables:** Previous knowledge of secondary school teachers, which was controlled by random sample selection.

METHODS :

This study was conducted by making a comparison chart of higher secondary life science curriculum and with the help of self-administered questionnaires. To differentiate between these curriculums, a content analysis had been done. The questionnaires were in English language and distributed to the participants. The tool 'Teachers' Attitude Towards the Curriculum Transaction' scale purports to measure the stressfulness, child centeredness of the curriculum. The scale explores the understandings and views of teachers about curriculum transaction and content. Samples were collected and their responses were scored. The questionnaires were in Five Point scale. The study was conducted on 6 higher secondary schools, 3 schools of CBSE and another 3 of WBCHSE. Questionnaire was used, consists of 17 items, to collect data from teachers. Four schools were selected: Saknara high school, Raina jagatmata anchalik balika vidyalaya, Alipore multipurpose government girls high school of WBCHSE and Purulia DAV model public school, Burdwan model school, DAV model school of Medinipore of CBSE. Data were collected and analysed by SPSS software version 20. The scale gives composite scores. Then the mean value, standard deviation value of samples of CBSE and WBCHSE came out. Column graph is used here to show the statistics.

RESULTS :

Hypothesis was- CBSE is more stressful than WBCHSE in case of higher secondary life science curriculum. To verify this hypothesis 't' test was applied.

Table 1:

	V2	N	Mean	Std. Deviation
V1	1	15	72.33	7.432
	2	15	58.27	6.453

[V1= CBSE, 1= Mean, Std. Deviation of CBSE

V2= WBCHSE, 2= Mean, Std. Deviation of WBCHSE]

Table 2:

Independent Samples Test	
t-test for Equality of Means	
t	df

V1	Equal variances assumed	5.535	28
	Equal variances not assumed	5.535	27.459

(Calculations are done by using SPSS software version 20)

ANALYSIS AND INTERPRETATION :

Curriculum analysis has been done to fulfill the first objective. The analysis has been done by hypothesis wise are as follows:

H₀1- There is no difference between WBCHSE & CBSE life science curriculum.

Table3 and **Table4:** A higher secondary life science comparison chart showing the curriculum difference between WBCHSE and CBSE.

Table 3:

CLASS XI				
UNITS	MAR KS	WBCHSE-SUBUNITS	CBSE- SUBUNITS	REMARKS
1. Diversity of living organism	07	1. Science of life 2. Taxonomy and systematic 3. Classification of living organism	1. The living world 2. Biological classification 3. Plant kingdom 4. Animal kingdom	Both syllabuses emphasized on living world and biological classification in details. CBSE classify plant kingdom and animal kingdom separately in separate subunits. CBSE allotted 23 periods for this unit but WBCHSE determine the 18 number of periods. Students can follow a clear, sequential view about diversity of life, classification and can also identify plants and animals scientifically.
2. Structural organization in plants and animals	12	4. Structural organization in plants. 5. Structural organization in animals	5. Morphology of flowering plants 6. Anatomy of flowering plants 7. Structural organization in animals	Both syllabuses are elaborative, scientific in case of this unit. CBSE syllabus has elaborated morphology and anatomy of flowering plants separately whereas WBCHSE has elaborated flowering plants in one subunit. But both are very interestingly same here. Allotted period of WBCHSE 14 and 22 in CBSE board.
3. Cell : Structure and function	15	6. Cell 7. Chemical constituent of living cell 8. Cell division	8. Cell: The unit of life 9. Biomolecules 10. Cell cycle and cell division	Comparing WBCHSE subunit 6 and subunit 8 it has been found that both the boards follow same areas and picture for elaboration is very good, but picture presentation of WBCHSE is better than CBSE. For HS level CBSE has elaborated biomolecules much more at organic level whereas WBCHSE follows sufficient content. WBCHSE allotted 23 periods and CBSE allotted 35 periods.

4. Plant physiology	18	9. Movement of water, food, nutrition and gases 10. Plant nutrition and gases 11. Respiration 12. Photosynthesis 13. Plant growth development	11. Transport in plants 12. Mineral nutrition 13. Photosynthesis in higher plants 14. Respiration in plants 15. Plant growth and development	Both syllabuses covering same topic, are rich in content. Students can know absorption, transpiration, respiration, plant nutrition, plant growth, photosynthesis, seed germination, growth regulators of plants. Allotted period for this unit in WBCHSE are 33 and 40 in CBSE. Both are very good in practical work.
5. Human physiology	18	14. Digestion and absorption 15. Breathing and respiration 16. Body fluids and circulation 17. Excretory products and their elimination 18. Locomotion and movement 19. Neural control and co-ordination 20. Chemical co-ordination and regulation	16. Digestion and absorption 17. Breathing and exchange of gases 18. Body fluids and circulation 19. Excretory products and their elimination 20. Locomotion and Movement 21. Neural co-ordination 22. Chemical co-ordination and Integration	Both syllabuses are covering same areas. Elaborations are very good. Both help students to know in detail about digestion, respiration, circulatory system, excretion, locomotion and human movement, nervous system, reflex action, sense organs, endocrine system and disorders related to all these biological acts. Students can be more scientific and biological and through these senses they can enlighten some dark sides of society like superstition. Here allotted periods of WBCHSE are 60 and 40 in CBSE. Practical work is very good.

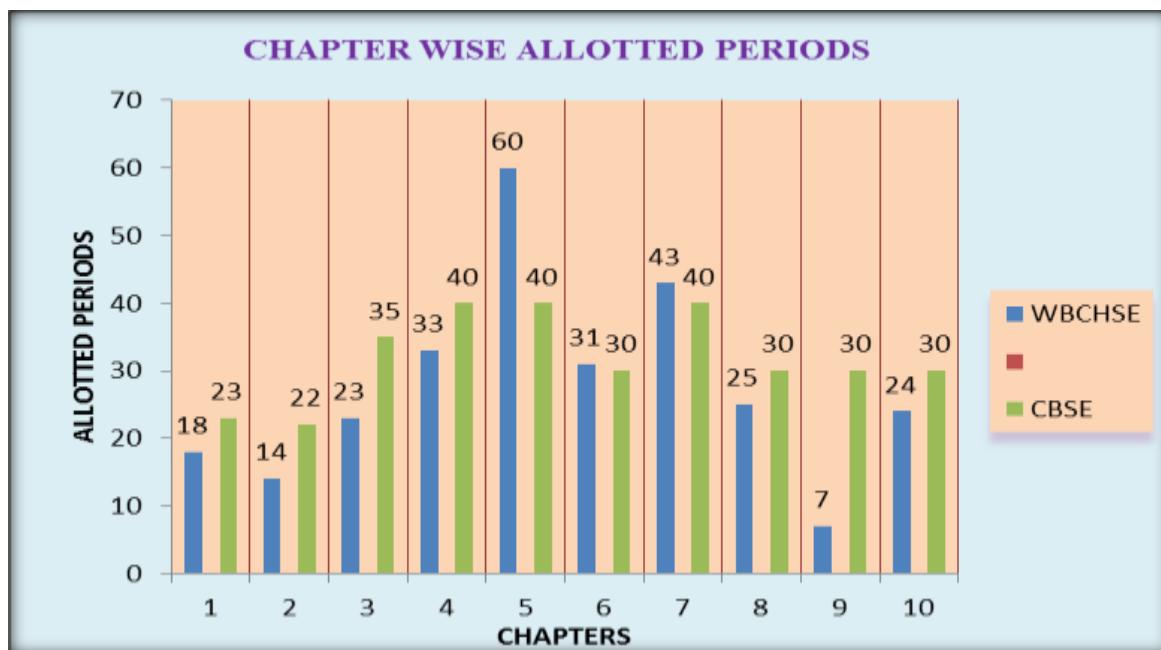
Table 4:

CLASS XII

UNITS	MAR KS	WBCHSE SUBUNITS	CBSE SUBUNITS	REMARKS
6. Reproduction in organisms	14	1. Reproduction in organisms 2. Sexual reproduction in flowering plants 3. Human reproduction 4. Reproductive health	1. Reproduction in organisms 2. Sexual reproduction in flowering plants 3. Human reproduction 4. Reproductive health	Both of syllabuses are covering same topic. CBSE syllabus has elaborated nicely and that is very good for understanding whereas WBCHSE is giving huge new information in subunit 3 and 4 that should be compact, so that student can know well which he is learning. Science books should be scientific story teller not to be an informative media only. But WBCHSE has elaborated each topic nicely. 31 allotted periods of WBCHSE and 30 of CBSE.

7. Genetics and evolution	18	5. Heredity and variation 6. Molecular basis of inheritance 7. Evolution 8. Mechanism of evolution	5. Principles of inheritance and variation 6. Molecular basis of inheritance 7. Evolution	WBCHSE and CBSE has elaborated and analysis this unit in detail nicely .Students can get idea about central dogma , biological evolution , DNA as genetic material , Genetic diseases, Sex determination , mechanism of evolution. Some pedigree charts are needed here for better elaboration. Allotted periods of WBCHSE and CBSE are correspondingly 43 and 40 .
8. Biology and human welfare	14	9. Health and diseases 10. Improvement in food production 11. Microbes in human welfare	8. Human health and diseases 9. Strategies for enhancement in food production 10. Microbes in human welfare	Both of the syllabuses are covering the same topics even organization of topics are not such different here . Students can know about immune system, parasites and diseases, Cancer, animal husbandry, microbes and bio control etc. in great detail. Allotted periods of WBCHSE are 25 and 30 in CBSE.
9. Biotechnology and its application	10	12. Biotechnology and its application	11. Biotechnology – principles and processes 12. Biotechnology and its application	Both of the syllabuses are covering the same topics, only organizations of content are different here. Students can know about genetic engineering, gene therapy, transgenesis very well. CBSE board syllabus has presented genetic engineering in separate chapter only. Allotted periods of WBCHSE are 7 and 30 in CBSE. CBSE emphasized this part to let the students know in detail that is good.
10. Ecology and environment	30	13. Ecology, environment and population 14. Ecosystem 15. Biodiversity and conservation 16. Environment issues	13. Organisms and populations 14. Ecosystem 15. Biodiversity and its conservation 16. Environmental issues	Both syllabuses are in detail with their topics. Students will know about adaptation, population interaction, ecological pyramids and succession, biodiversity and conservation, students will be aware about pollution and different environmental issues. WBCHSE allotted 24 periods whereas CBSE allotted 30 periods here.

DIAGRAM 1: A GRAPHICAL REPRESENTATION FOR COMPARING MEAN AND SD VALUE OF CBSE AND WBCHSE.



From Table3 and Table4, a graphical representation of chapter wise allotted periods is done here. Chapter1 to Chapter5 are of class XI and Chapter6 to Chapter10 are of class XII. From this graph it can be said that, WBCHSE allotted more periods than CBSE for Chapter5, Chapter6 and Chapter7 but CBSE allotted more periods than WBCHSE for the rest chapters (Chapter1, Chapter2, Chapter3, Chapter4, Chapter8, Chapter9, Chapter10).

Table 5: Question wise break up

Type of Question	Mark(s) per Question		Total No. of Questions		Total marks	
	WBCHSE	CBSE	WBCHSE	CBSE	WBCHSE	CBSE
Very short answer	1	1	8	5	8	05
Short answer-I	3	2	9	5	27	10
Short answer-II	2	3	10	12	20	36
Value based question	-	4	-	1	-	04
Long answer	5	5	3	3	15	15
TOTAL			30	26	70	70

Here, difference between WBCHSE and CBSE in case of question wise breakup during evaluation is noticed. CBSE distribute marks also for value based question.

After analysing these all it can be seen here that the null hypothesis is rejected here i.e. there exist significant differences between WBCHSE and CBSE life science curriculum.

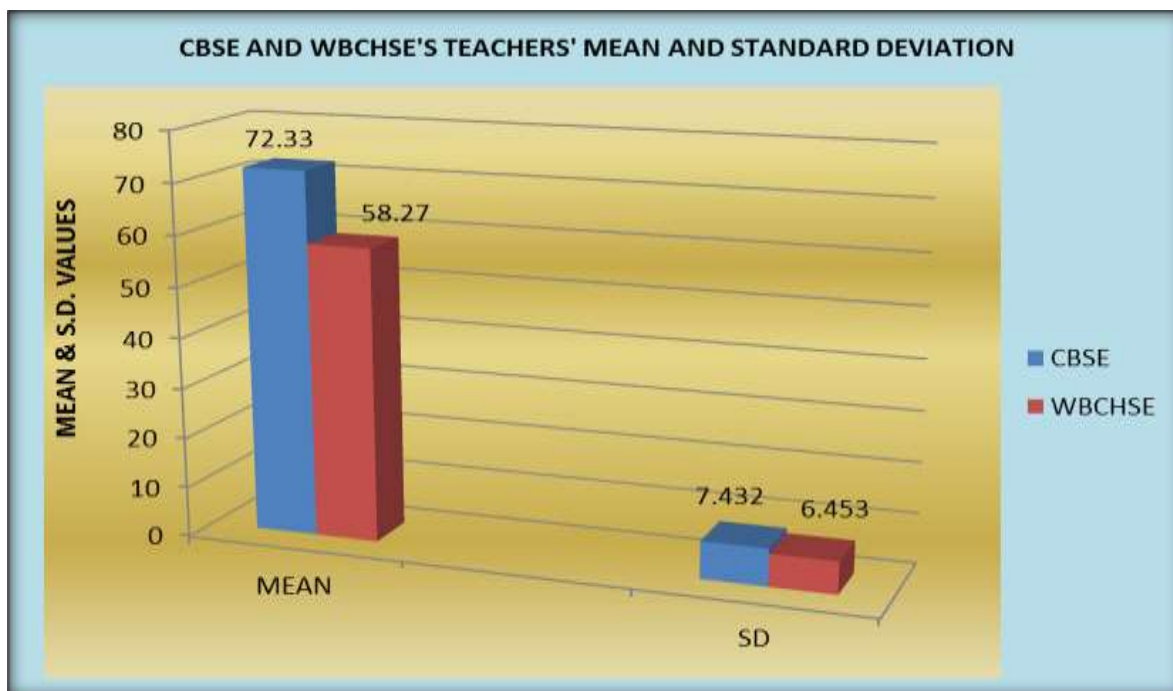
H₀2-There is no differences of stressfulness between WBCHSE and CBSE life science curriculum.

Table 6: From Table1 and Table2:

Sources of variation	Number of students	Mean (M)	SD.	't' value	Tabulated 't' value	df.
CBSE	15	72.33	7.432	5.535	2.05	28
WBCHSE	15	58.27	6.453			

At 0.05 significance level.

DIAGRAM 2: A graphical representation for comparing Mean and SD value of CBSE and WBCHSE.



The result in the table6 shows that the mean value of CBSE is 72.33 which is greater than mean value of WBCHSE that is 58.27. The standard deviation of CBSE is 7.432 and the standard deviation of WBCHSE is 6.453. The above graph shows the differences here.

The above table6 reveals that the calculated 't' value is more than the tabulated 't' value at 0.05 significant level and at 28 degree of freedom. Thus there exists a significant difference of stressfulness between CBSE and WBCHSE life science curriculum where CBSE is more stressful than WBCHSE and hence second null hypothesis is rejected.

DISCUSSION:

From the curriculum comparison chart it can be said that-

These updated syllabuses provide new concepts to the students. Syllabuses are emphasizing on the basic sense of biology so that students can relate the theoretical knowledge to their real / every day's life through the use of technology. Syllabuses of WBCHSE and CBSE higher secondary life science are very interesting, innovating, motivating; learning and appreciating basic things with relevant images in great detail. In case of CBSE, there is no formative or summative evaluation on theory and practical at the end of class XI, but WBCHSE evaluate class XI and class XII separately. Despite of poor infrastructure, majority of schools try to conduct practical scientifically with great care. But both syllabuses are good and well-organized in practical. CBSE syllabus divides periods objectively and follows the revised bloom taxonomy parameters for evaluation. WBCHSE syllabus is now in lack of content delivery as some schools have no sufficient expert teachers. Question wise breakups are not same in WBCHSE and CBSE. CBSE syllabus has an extra type of question and that is value based questions of 04 marks. But both have 70 marks for evaluation in total of each.

From the survey the 't' value reveals that the CBSE and WBCHSE differed significantly. As the Table-6 indicated that the mean of the CBSE is 72.33 and the mean of WBCHSE is 58.27. The standard deviation of students of CBSE is 7.432 and the standard deviation of WBCHSE is 6.453. The 't' value 5.535 was found to be significant at 0.05 level of confidence. Hence, CBSE is more stressful than WBCHSE in case of higher secondary life science curriculum.

FINDINGS:

1. Teachers are now conscious about curriculum transaction in the classroom.
2. Both syllabuses are good and well-organized in case of practical work.
3. Both syllabuses are almost same in case of theoretical part.
4. Periods allotted for each content are not same.
5. There was a difference in case of question wise breakup during evaluation.
6. Evaluation systems of CBSE and WBCHSE are not same.
7. Evaluation pattern of life science curriculum is scientific, less-stressed.
8. More or less all students are interested to do practical work.
9. Guardians are less involved in case of students' education according to teachers' view.
10. CBSE is more stressful than WBCHSE in case of life science curriculum comparison.

CONCLUSION :

Education is the primary vehicle of upward mobility in aspects of social, moral, economic, political and so on. Today India is running uniquely to become powerhouse of new knowledge. A move has been made in the direction to improve the learning environments in different subject areas, particularly in bioscience, at school level. Child-centric science curriculum can make learning effective. Higher secondary life science curriculum can help one to study life science further and can help in research purpose. Life science helps to learn how you can live healthy and how you can make decision scientifically. This study reveals that there are significant differences between CBSE and WBCHSE life science curriculum. CBSE life science curriculum is found more stressful than WBCHSE. This comparative study will help you to know about higher secondary life science curriculum of both CBSE and WBCHSE at a glance with some important aspects and to know the preferable one between CBSE and WBCHSE in case of life science curriculum.

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