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Climatic cartography: A study on topographical map in higher secondary education in Beldanga block, Murshidabad

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Abstract
It is important to transfer knowledge from the stage of sensory to conceptual by the use of perception. In our base level education system need to give real base knowledge to the students. Geography is one of the most real base subject which explains the earth's climate by its own Science. Cartography is a part of geography which can help students to understand the climatic condition of the particular place. At present higher secondary school system in West Bengal topographical map only describes the physical and cultural structure but there is no explanation between topographic features and the climate.
The aim of this study is to assess the concept of students about the climate on the topography and how much climate effect to earth's surface with the analysis of Topographical Map by the help of geography teachers in H.S Schools in Beldanga Block. In this study here is implemented the questionnaire for the teachers and the students. They are asked about the understanding level, previous knowledge and interest level of the students about the relationship between cartography and climatic condition. This study has also recommended the cartographic presentation of climate which can be add to H.S syllabus for the better learning of climatic changes and its effect.

Keywords: climate, cartography, topographical map, curriculum

Introduction
Topographical maps are very important for showing natural and cultural features of a place. The main component which is mainly shown in the map is relief. Topographical maps are not only use to interpretation of natural and cultural features of a place but also chance to interpret the place with the correct explanation. It can be explain the formation of physical features by the works of river, rainfall, temperature, locational extension etc. By the use of topographical maps we can explain many components on the earth's surface. It is time to culture our knowledge by more and more practical works. In our school system, practical works are done with the theoretical process. In the present time, project work must be prepared from class (IX) to (XII) in all subjects. But maximum students use to copy this work. So their knowledge limit to copy level in the project book. We have to give them a chance to inculcate their knowledge by the realistic knowledge in geographical practical works.
The main function of geography teaching is the relationship between man and environment. In topographical map, physical and cultural features are shown together. Students want to know the physical features not only in maps but also they want to see the real pictures i.e their surrounding at first. In this process their knowledge will grow from sensory stage to concrete and will be able to correlate the present physical features. And now the students automatically explain and analyze the other variable with the present situation. It is our unfortunate that in our education system for class (XII) teachers doesn't use topographical maps efficiently. This is because of the insufficient on quality maps in education system and markets and teachers educated without proper explanation and map use skills. Consequently school teachers face methodical problems and less than will power.

Objectives
In my paper it is analyzed interpretation of topographical map in class (XII) practical syllabus. It is determined the understanding level, previous knowledge and interest level of the students about the relationship between topographical map and climatic condition. It is also analyzed that how much climate effect on topographical maps. The main aim of this study is to explanation of topographical maps most interesting, brainstorming and conceptual base learning. For this purpose for clarifying current situation, I have done a questionnaire with some higher secondary school teachers in Beldanga Block, Murshidabad.

Approaches and Methods
Firstly I have described a problem: By using topographical maps in practical of class XII, could student understand and explain climatic condition readily? Or not…With the interaction of the school teachers it is determined many deficiencies in term of concept of climatic condition base on topographical maps. When searching for answer to the problem, different situations may arise if the answer is negative, this should be considered. For this reason these situations may occur—

1. Students don't have enough knowledge about the relationship between climate and topographical map.
2. During the course, teacher does not give enough importance to the use of topographical map.
3. Identification of physical and cultural features is difficult for the students.
4. There are unavailable of climatic data in schools.
5. Students have no enough concepts in explaining topographical map.

To investigate and clarify these reasons, I have implemented a study with some teachers in Beldanga Block. In WBCHSE geography class XII syllabus, Map scale, Cartogram, Measuring Weather elements, Weather map, Temperature and Rainfall Graph and Field report are studied. In class XII geography practical syllabus, study and interpretation of topographical map is studied.

In our state education system students of class XI and XII are taught by PG level geography teachers. For this reason it is implemented questionnaire to these teachers. I have selected seven schools randomly. Twelve teachers were participating in this study. Questionnaire was performed face to face by the way of interviewing with teachers. The teachers are asked 20 questions and it is presented some options for each question. Questions are below:

1. Are students has clear concept on map scale?
2. Do students know the function of latitude and longitude on a topographical map?
3. Can the students measure the direction of the selected topographical map?
4. Can the students identify the topographical features from the topographical map?
5. How are they identifying the physical features? You can select more than one option.
6. Do the students explain exactly the cause of formation of identified relief?
7. Do the students mention the climate for the cause of topography formation?
8. If yes, which is the cause of topography formation according to the students? You can select more than one option.
9. Do the students think that there are any relation between climatic change and topography?
10. If yes, which relief is/are related with the climatic change? You can select more than one option.
11. Can the students have idea about the rainfall amount by observing natural vegetation on the topographical map?
12. Is there enough time for map use in the class?
13. Which subjects on topographical map are difficult for the students? You can select more than one option.
14. Do students show interest in identification and explanation of topography?
15. Are the explanations on topographical map in practical textbook sufficient for the better understanding for the students of class XII?
16. Do you think that climatic condition must be explained on the base of natural and cultural features on a topographical map?
17. If yes, how can be explained climatic condition of a place on topographical map? You can select more than one option.
18. Are there any available climatic data for explaining climatic condition on the selected topographical map?
19. Is the curriculum on topographical map reachable to the students of class XII?
20. If no, please mention the parts which need to omit and which need to add in the class XII curriculum.

Table 1

Questions	Answer/Option	No. of Teacher Choose this option	Percentage (%)
1st	Yes	11	91.66
	No	1	8.33
2nd	Yes	11	91.66
	No	1	8.33
3rd	Yes	12	100
	No	0	0
4th	frequently	10	83.33
	Occasionally	2	16.66
	Rarely	0	0
5th	By observing contour value	9	60
	By observing alignment of contour	2	13.33
	By cross profile	4	26.66
6th	frequently	5	41.66
	Occasionally	6	50
	Rarely	1	8.33
7th	Yes	8	66.66
	No	4	33.33
8th	Rainfall	6	46.15
	Temperature	6	46.15
	Wind	1	7.69
	Evaporation	0	0
9th	Yes	8	66.66
	No	4	33.33
10th	Plain	3	25
	Hill	5	41.66
	Plateau	4	33.33
11th	Strong	4	33.33
	Moderate	8	66.66

	Poor	0	0
12th	Yes	9	75
	No	3	25
13th	Identification of natural features	2	12.5
	Identification of cultural features	3	18.75
	Explanation of natural & cultural features	4	25
	Transact chart	7	43.75
14th	frequently	6	50
	Occasionally	4	33.33
	Rarely	2	16.66
15th	Yes	11	91.66
	No	1	8.33
16th	Yes	9	75
	No	3	25
17th	Use of climatic chart	5	35.71
	Use of Ombrothermic chart	1	7.14
	Use of Hythergraph	1	7.14
	Use of Weather Map	7	50
18th	Yes	3	25
	No	9	75
19th	Yes	10	83.33
	No	2	16.66

Result

While teachers were answering questions some notes was taken related with teacher's option and attitudes. Some teachers showed great interest to my study, some others did not. Some teachers answered questions with care attention, others answered hurriedly.

In the first three questions more than 90% teachers said students have base level knowledge i.e knowledge like concept on map scale, latitude and longitude etc to enter the topic topographical map. They said to study topographical map, students have already learned latitude, longitude in secondary school and map scale, cartograms, field report in class XI. But below 10% teachers said the students of their school have not enough previous knowledge due to inattentive in the class and also forbidding. About 80% teachers told that students can identify maximum no of topographical features from topographical map. But about 17 % teachers have observed students occasionally identify them. It is most important that how to identify physical features. There are mainly three processes by which can be identified by a student. In the 5th question 60% teachers thinks that students are more comfortable to identify physical features by observing contour value, 27% teachers support the 3rd option "By cross profile" and remain 13% teachers think students identify by observing alignment of contour (Figure 1). Most teachers said that the second option is more useful for higher class students.

In the 6th question, are asked the question which is not directly related to the syllabus that the cause of formation of identified relief. So, maximum teachers (50%) answered occasionally and about 9% said students identify the cause hardly. Remain 40% teachers observed that student explain the cause of formation of relief as the teachers help student to understand the cause of the relief by explaining climate effect on physical features (Figure 2).

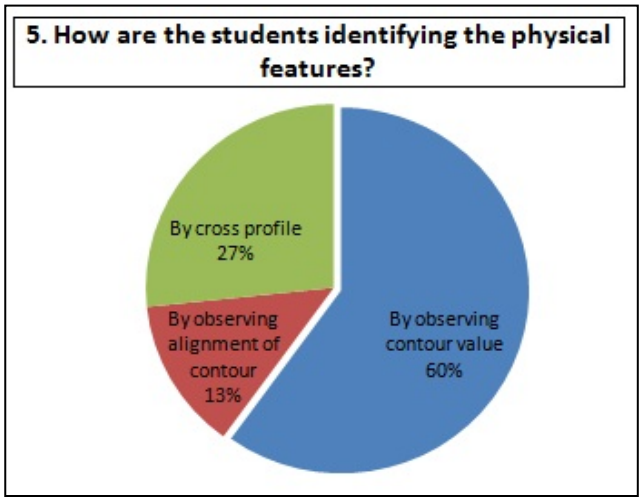

Fig 1: Identifying process of physical features Cause of formation of identified relief

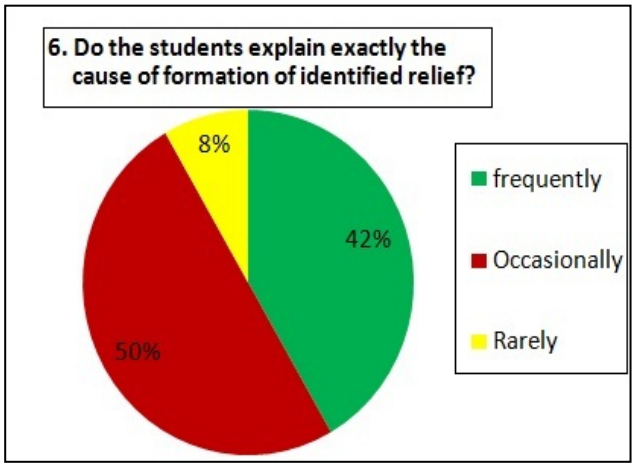

Fig 2: No. of student explain

In the 7th question, among 42% teachers about 67% teachers said that student considers the climate which is cause for topography formation. And others 33% teachers said students think diastrophism, mass wasting and erosion by the river are responsible for the topography formation. In the next question among 67% teachers who said climate is the cause of topography formation, 92% teachers said students do responsible rainfall and temperature as component of climate for the change of topography. And about 8% teachers think students follow wind action.

In the 9th question, about 67% teachers showed their students can relate topography with the climatic change. They think when rainfall amount increase, the river erosion speed also increase. So the formation of deep valley in Upper River and floodplain in Lower River is gradually increased. Floodplain is good for agriculture and also intensive rural settlement.

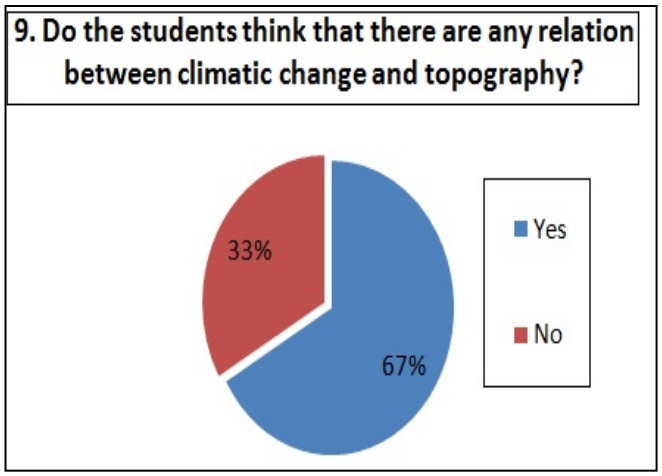

Fig 3: Relation between climatic change and topography

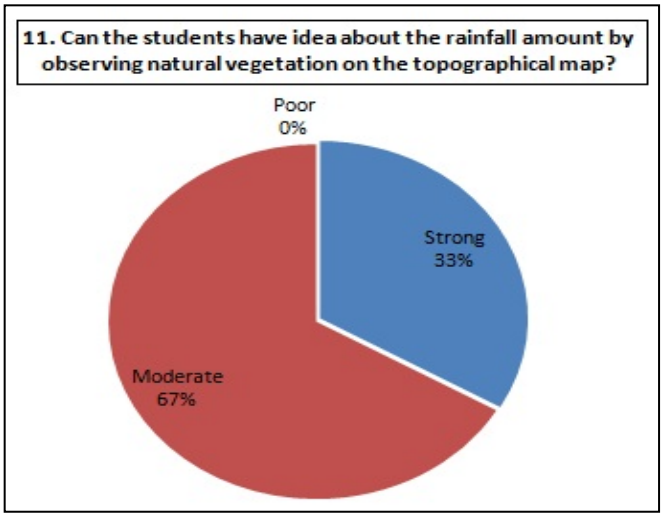

Fig 4: concept on rainfall amount observing natural vegetation

In the 12th question, 75% teachers get enough time for map use but 25% teachers said the excess number and different IQ students in the class are the problem of map use. 50% teachers said students show great interest in identification and explanation of topography map. It is seen in the 13th no question, most teachers (about 44%) observed it is most difficult to formation of transect chart due all features have to show in a single chart. Second most teachers (25%) said explanation of physical and cultural features are most difficult than other to the students. Although, teachers (about 92%) think explanation of topographical map in practical textbook sufficient for the better learning but they also think that those students need to more practical works on the base of direct knowledge and field trip.

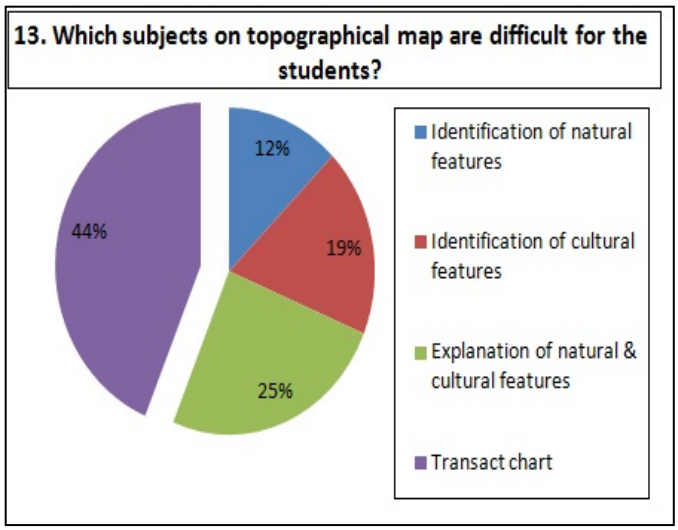

Fig 5: Difficult parts in Topographical Map

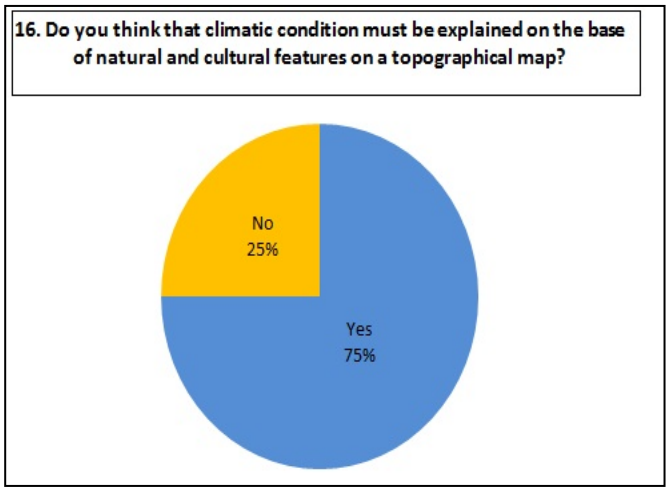

Fig 6: Percentage of teachers who want to explain climatic condition on the base of physical and cultural features on topographical map

The most interesting and formally in contextual question is asked in 16th no question. 75% teachers think that by observing physical and cultural features, climatic condition like rainfall and temperature can be calculate on a topographical map on a particular place.

The average no. of teachers said there will be high rainfall area where evergreen natural vegetation are mostly found and high temperature and low rainfall area for vegetation less area, low rainfall and low temperature area for coniferous jungle etc. Like high compact rural settlement is sign of comfortable climatic condition for agriculture and human beings.

In Figure 7, among 75 % teachers, 50% teachers want to explain climatic condition of the particular place by use of weather map and 36% teachers want to use climatic chart. It is the problem that maximum teachers (75%) said that climatic data for explain climatic condition on the selected

topographical map are not available. But 25% teachers said the climatic data will be available in nearest weather station with special permission.

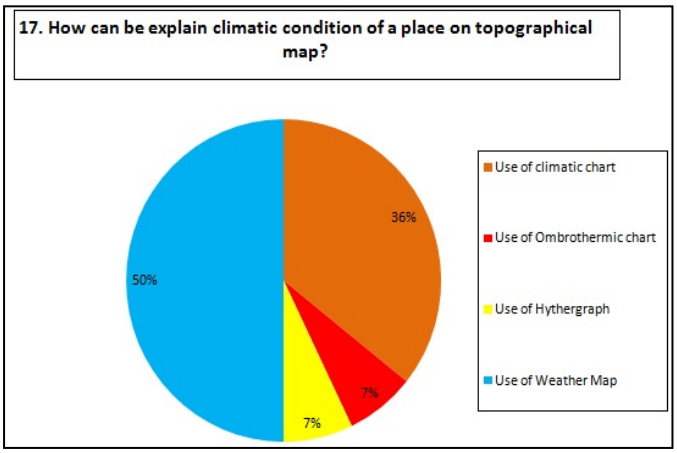

Fig 7: Use of different method for explain climatic condition on

Ques.no. – 19, was about the satisfaction with class xii curriculum on topographical map. About 83% teachers think that is enough for the better learning of class xii students. According to them, there is strong definition, interpretation of deferent relief and cultural features, characteristics, index, pictures, diagrams and map etc. but remaining 17%teachers think that the syllabus on topographical map is vast. Here are many topics which are not totally reaching to the students.

Let's see the overall looks on to the previous knowledge, interest level of the students on to interpretation on topographical map. According to the maximum teacher (over 90%) are in one opinion that it is not difficult to understand and interpretation the topographical map for the students who have already gain previously the different parts of a map, relief, vegetation, river, and locational extension etc. students also showed interest as toposheet and the different sign of cultural features are something new to them.

And in the last, it is observed in the finding of the work. Main objective of this work was the concept of the students on climate which change topographical features i.e. concepts of the students on the relation between climate and topographical features and applicability and use of climate on topographical map.

- About 67% students have concept in the effect of climate to the topographical map and can have related topographical features with the climate.
- Students (67%) think that rainfall and temperature are responsible for formation of topographical features.
- They also think that topography is changing with the change of climate and hill, plateau are the main effect of climatic change.
- Finally 75% Teachers want to explain climatic condition of a place by observing physical and cultural features of that particular place on topographical maps. By this explanation process students can grow their concept and better learning on topography and also climate.

Conclusion and Further Research

Attitude, skill and willpower can change many things which we feel difficult to teaching and learning. At the present time, school education curriculum has been changing with the new thoughts, practical base knowledge but school teaching has been changing with cramming and marks. In this situation it's time to change in evaluation system not only for the students but also for the teachers. In this study teachers have low interest and also answers were partially his own choice not for student choice. So it can be done for further research which will be based on student's direct interaction for better understanding value of the school education. Here are some suggestions for further works –

- Cultural features: a study on topographical map.
- Climate effect culture: a comparative study on topographical maps.
- Teaching and learning: a study on topographical map.
- Skill base practical or real base practical: a comparative study on topographical map.
- Evolution of school teaching: a study on cartography.

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