Pin Point The Absolute Location Of A Place On The Earth's Surface Based On Scaffolding Strategy

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Abstract- *A social constructivist based scaffolding strategy has been developed for locating positions on the earth using latitude and longitude, for introductory geography students. The main purpose of this strategy is the determination of the location of a place on earth surface. The strategy will help the introductory geography studentstolocate positions on the earth using latitude and longitude. Thus this scaffolding designed activity serves as a great way to reinforce understanding of specific topic in the course. In our experience this activity is much more stimulating to students than the traditional approaches.*

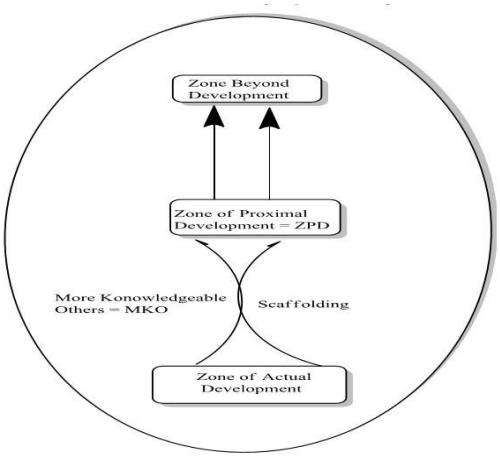
Keywords- Introductory Geography, Scaffolding, Collaborative/Cooperative Learning

I. INTRODUCTION

With help, every child can do more than they can do on their own'

------ Vygotsky,

The process of Scaffolding is referred to as a metaphor that provides support to the methods teachers engage in order to help students learn. The concept is derived from Lev Vygotsky's view of 'zone of proximal development' suggesting the difference between what a student is capable of doing independently and that which could be attained through help. It was Wood, Bruner, and Ross (1976) who used the word scaffold and not Vygotsky.



The process of Scaffolding is about dividing learning into many stageswhile supporting the students to develop these steps - the concept of learning in charge. In case of assignments beyond the student's ability, the teachers must step in to provide assistance. It becomes essentialto allow students to finish very quickly, without being heard. Scaffolding can be viewed as a bridge as it is always built on what students can get into in terms of something that they don't know. Teachers use many types of scaffolding to support students' learning. In the broadest sense, a long-term curriculum plan can be thought of as a scaffold. In day-to-day teaching scaffolding can be spontaneous and informal .

when a student is struggling to draw a cross-section and a teacher asks a series of supportive questions to talk them through the process and their problem.

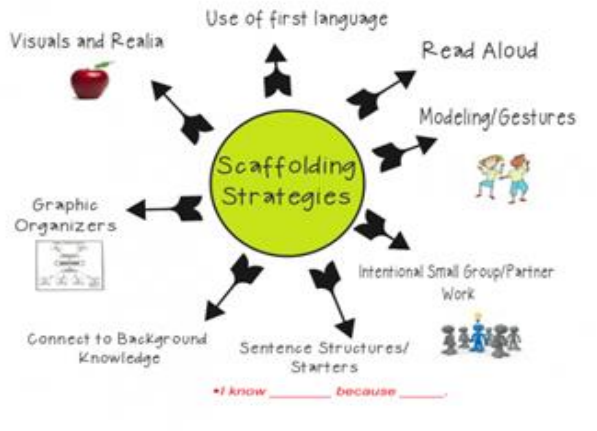
Scaffolding is associated with segregation simply because students need a variety of support. Great goal is that the student uses their knowledge or skill independently i.e. without support. But for all students in a class to achieve this, the scaffold will need be removed earlier for some than for others. It is a teaching strategy for students of all ages; e.g. it can be used when teaching a level classes for developing a sophisticated understanding of argument and counter-argument. Scaffolding also goes hand in hand with diagnostic and formative assessment Monitoring the need for scaffolding should be on-going; teachers do this through interactive talk, ongoing dialogue, formative questioning, listening and careful reading of students' responses.

II. SCAFFOLDING STRATEGIES

There are some strategies followed by scaffolding theory which helps students to understand the theory or the subject. These strategies are-

(1) Tap into Prior Knowledge
(2) Brainstorming and concept making
(3) Teacher intervention/ discussion
(4) Peer discussion
(5) Pre taught vocabulary
(6) Time for talk
(7) Grids and frameworks

(8) Teacher modeling
(9) Additional resources



III. SCAFFOLDING METHOD IN GEOGRAPHY

DETERMINATION OF THE LOCATION OF A PLACE ON THE EARTH'S SURFACE

A. GLOBE: Earth cannot be termed as a globe as it is slightly compacted towards both the poles i.e., North and South and then goes on to expand in the middle. The Globe is a real (small form) model of the universe. The bulbs can vary in size and type - large, portable, small pocket light bulbs, and balloon-like balloons, can be raised and light and easily handled. However, it becomes difficult to locatea point on a particular location in the earth. The query here is to how you can find a place in it. You will notice that the needle is adjusted in a rounded direction also known as its axis. There are two exact points on the globe where the needle passes two poles - the North and the South. The earth here can be rotated around the needle from west to east exactly similar to that of the earth moves. The real world does not have such a needle. It rotates on its axis, which here is the line of thought.

B. LATITUDES: Graticule on Earth as a sphere or ellipsoid. The lines from the stem to the stem are the lines of a fixed length, or meridians. Circles are like a continental line of a fixed width, or parallel. Graticule indicates the length and length of the points above. In this example the meridians are separated by 6 ° intervals and corresponding to 4 ° intervals. There exists one line of thought that specifically works to divide the globe into two equal halves; the line is popularly known as the equator.

The parallels of latitude

These two parts of the world are known as Northern Hemisphere and Southern Hemisphere. The former represents the northern part of the world and the latter refers to the southern part. It is to be noted that the equator constitutes zero-degree width. The equator and certain poles has a distance of one-fourth of the circle around the earth, it measures an angle of 360 degrees, e.g. 90 °. Therefore, 90 degrees latitude marking the North Pole and in the similar manner is is the 90 degrees south latitude that indicates the SouthPole.

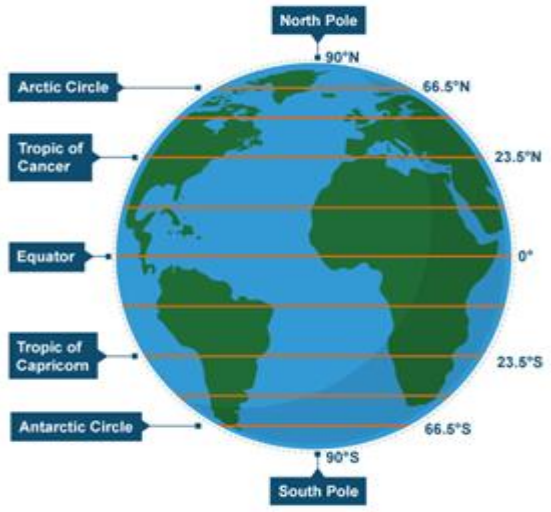
CHARACTERISTICS OF LATITUDE-

I) Latitude can be described as the angular distance of the area constituting the north or south of the Equator

ii) There are 180 parallels of latitudes apart from the Equator.
iii) Each parallel of latitude is a circle.
iv) Only the Equator is a Great Circle, all the rest of the latitudes are Small Circles.
v) The distance between two latitudes is always equal.

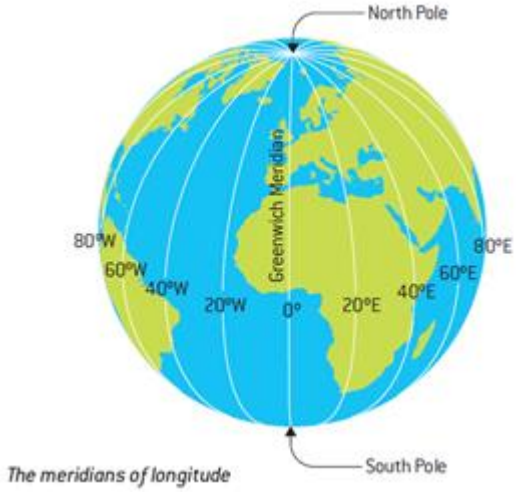
C. IMPORTANT LATITUDES:

Outside of equator (0 °) and considering the North Pole (90 ° N) along with the South Pole (90 ° S) lies a wide range of important similarities in areas—



(1) Tropical Cancer (23½ ° N) located in the Northern Hemisphere.
(2) Tropic of Capricorn (23½ ° S) locatedin the Southern Hemisphere.
(3) Arctic Circle at 66½ ° along north of the equator.
(4) Antarctic Circle 66½ ° along south of the equator.

D. LONGITUDE : To adjust the position of any place, there is a necessity to have something that exceeds the area's latitude. For example, one can consider the islands of Tonga located in the Pacific Ocean and the Mauritius Islands present in the Indian Ocean. They are located at the same distance which is 20 ° S. In order to get the accurate reading, one has to identify the distance of these places i.e. how far east or west these places are from they are with respect to the reference line running from North Pole to South Pole. Thelines of indicators being considered here are known as meridians of longitudeand distances between them are being measured using the parameter of 'degrees of length.



The meridians of longitude

CHARACTERISTICS OF LONGITUDE-

(1) They are referred to as meridians.
(2) They do exist in the north-south direction.
(3) The distance either east or west of the firs/prime meridian needs to be measured.
(4) They are farther away from the equator and goes on to meet on the poles

E. LONGITUDE AND TIME: Some of the best ways mentioned to measure time are referred to as estimating the movements made by the planets including earth and the moon. Considering the sun rising and setting every single day makes it the most timely process in the world

LOCAL TIME- The calculation of local time can be on the basis of the shadow created by the sun, which can be interpreted as the shortest during the day and the longest at the time of sunrise and sunset.

STANDARD TIME - Equal time for approximately the same lengths, established nationally or regionally by law or tradition. In India, a height of 82½ ° E (82 ° 30'E) is considered a normal meridian. Local time on this meridian is considered normal national time. It is referred to as the Indian Standard Time or IST.

IV. STRATEGIES TO DISCUSS THIS CHAPTER WITH SCAFFOLDING METHODS

Emphasis on the use of scaffolding that the teacher is a participant and information facilitator in consultation with the student and in this case can provide effective support

Tap into prior knowledge - This is a common strategy where teachers talk with students about their prior learning in earlier

geography lessons or topics, or draw on their experience from their world outside of school.

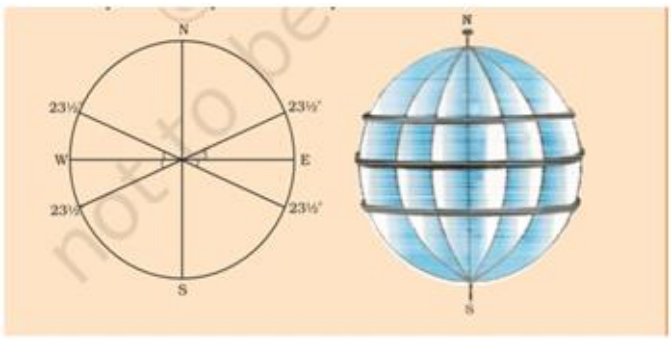
Teacher come in the class and asks the students about the various shapes like, circle, triangle, and square. Again, he tries to relate these shapes with practical examples bases on student's prior knowledge, i.e. he can ask what is the resemble with square that we found in our environment? Students might give the answer that ice cubes. Again, he asks then what is resemble with triangle? They said pyramid. Teacher encourage them ask to give example of a circular shape. Students say football, orange and so on. That time teacher relates its shape with Earth.

Brainstorming and concept mapping Activities such as these, and creating mind maps and spider diagrams at an early stage of teaching a new geography topic can provide a scaffold for ongoing learning through the topic.

Teacher come in the class with an orange and tells the student that this shape of orange is just similar to our Earth. Now he will point his finger on a particular place of the orange and offer this orange to a group of students that in exactly which place he placed his finger?

In another way, Teacher allow them to create a mind map by assuming that if they lost in market, they will give any land mark or identical places by which someone can find them. But what if they lost in a middle of sea? Then how they will give their location toanybody? They should work with these topics in their mind while teacher start with the shape of Earth, latitude and longitude topic.

Teacher intervention/discussion - This is probably the most frequently used scaffolding strategy, or it should be.When students start working independently when solving a question or doing a task, it provides the teachers involved with opportunities to work towards providing scaffolding measures with the help of questioning and engaging discussions with groups / individuals.



The assigned teacher can form small groups of learners and give them the same task –The students would be asked to first draw and then cut six circles of equal size say about 3 cm. Radius each on a cardboard. Then they need to mark the millimeters (NS, EW) with $23½^0$ angles on either face of the circles as just shown in the picture. The next step would be to keep a circle on top of one and then go on to sew on the NS line. Now there occurs twelve circles. Out of which it is allowed for one circle to represent 0^0 or Greenwich Meridian or Prime Meridian.

The circle that forms the sixth place will be a 180o Meridian. Between 0^0 and 180^0 there lies 5 cycles on both the sides which form a separate area West and East long 30^0. The two ends of the vertical anchors now are to represent the North and South Police while the rubber band around the EW points model will go on to represent the Equator. The hot spot would now be represented by the two rubber bands touching $23½^0$points which are the South and North EW points.

While they doing this teacher can move to their place and discuss some basic matters like definition of latitudes or how they circled all- round the Earth.

Peer Discussion - Full-time staff does not always have to be teacher who provides support, but can occur and provide support in the form of a peer, for example, through careful composition of groups, or by getting 'buddy' pairs to work together

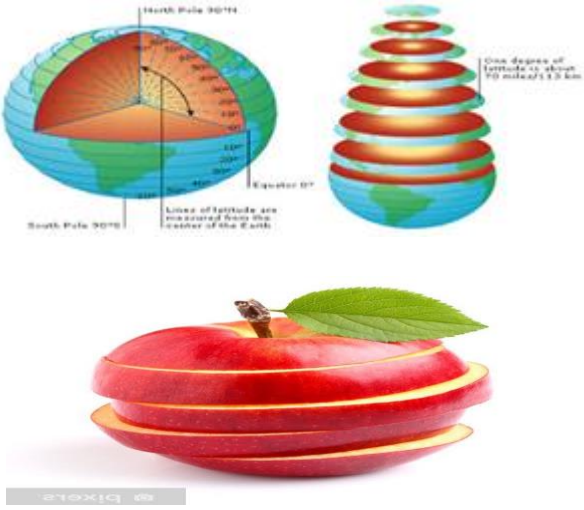
1:1 DISCUSSION - In this scaffolding strategy learner can learn from their classmate who understands better in the class. Like a example can be given, while they are playing basketball the learner who understand the topic better than other learner, he can explain the shape of the earth, latitude, longitude by showing the basketball.

V. BUDDY GROUP DISCUSSION

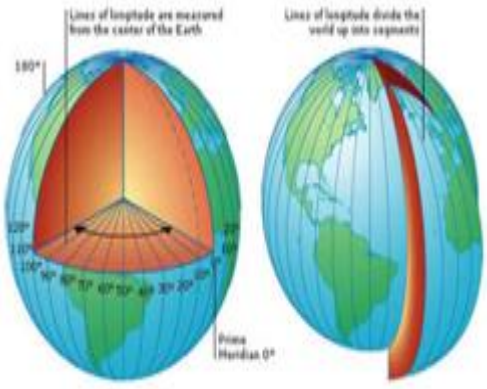
Teacher for better understanding divided the students into small groups i.e. 1:4. Each group will have a student who understand better and when teacher provide them a world map to find out the estimated latitude and longitude of a country that student explain the things to his buddy group how to find out latitude and longitude of a particular place. In a class there are various types of students so this strategy will be beneficial for the moderate learners and also it will be interesting for the students to gain knowledge.

NAME OF THE BUDDY GROUP	NAME OF THE COUNTRIES
A	China, Iran, Nigeria, Ghana, Mexico
B	Bangladesh, Nepal, Burundi, Namibia, Cuba
C	Sri Lanka, Israel, Egypt, Kenya, Canada
D	India, South Korea, Madagascar, Somalia, Jamaica
E	Japan, UAE, England, Denmark, Brazil
F	Oman, Pakistan, Spain, Portugal, Argentina

MORE KNOWLEDGEABLE OTHER- It refers to someone who has a better understanding or a higher ability than the learner.



In this scaffolding strategy learner takes help from someone outer from their school premises. That can be their seniors, or elder brother or sister. Because all time bookish knowledge is not helpful to understand. As the children can't cut an apple by their own so the seniors or brother/sister can cut the apple and explain them that like the apple is cut in a circular shape thus the latitude is also in circular shape divided the earth in equal halves.



Similarly, when it comes to discussion about longitude, they can explain it by cut the apple vertically.

Pre-taught vocabulary Advanced vocabulary Revised teaching of geographical vocabulary and new vocabulary early on in a topic is a scaffolding strategy. In the subsequent activities and lessons students use this vocabulary and build an understanding of the meaning in different geographical contexts.

In this strategy teacher give some words from the taught portion and asks students to make a sentence with geographical context. E.g.-

TEACHER	STUDENTS' PROBABLE REACTION
AXIS	An imaginary line which connect north and south pole through centre of the earth
PRIME MERIDIAN	It refers to an imaginary line that goes on to connect the north and south pole all through the surface of the earth
EQUATOR	The line of thought known as the equator is working actively on the globe and responsible for dividing it into two equal parts.
LOCAL TIME	Local time can be effectively calculated by the aid of the shadow coming from the sun. An imaginary line occurring in the process to connectthe north and south poles to the surface of the earth
IST	Indian Standard Time

Time for talk - Students do require some amount of time in order to be able to process the new geographical ideas and information and talking to their peers verbally helps in making meaningful instances from the new ideas. Teachers that halt a class explanation or discussion to give time for structured talk such as 'think-pair-share' or 'triads' are adopting a form of scaffolding.

When teacher give students the information that with every 1º longitude difference time differs for 4 minutes and with 1´ longitude difference time differs 4 second. Getting the information students talk among themselves that what if they move to eastward? Time will be increased or decreased? This question leads them to construct a geographical idea as sun rise east that's why time is earlier in eastern part than the western part.

Additional resources - These can be provided in the forms of help sheets, briefing sheets, worked examples, vocabulary

sheets etc. Such 'scaffold resources' can be made available to specific students who need them, or if students request them. Teacher can provide any worksheet or resource sheet with some extra knowledge of the taught chapter. There students can check their understanding and also if they have some doubts, they can clear it.

Implementation of proposed method-

Sample- Total 36 numbers of students of class X fromCarmel Conventschool from Durgapur were the participants in the study.

Area- Carmel Convent school, Durgapur

Statistical test- In this study T-Test, Graphical Representation and Mean Variation method has been applied.

Tools– the post-test has been developed to compare the effectiveness of Scaffolding Based Social constructivism teaching method with traditional method.

Administration of questionnaire and collection of data- In this Quasi- experimental research study we developed an post evaluation test of experimental group and control group.Out of 36 students, an experimental group was designed comprising of 18 students of 9 boys and 9 girls. On the other hand out of 18 students of control group number of boys and girls were 9 and 9 respectively.

Analysis of data and interpretation & conclusion-

In this study, two teaching methods are- a) traditional method, and b) convergent-divergent theory. As per the design of Quasi experimental research, two groups were formed, from secondary schools where students came from more or less same socio – economic level.

MEAN SCORE OF THE STUDENTS OF CARMEL CONVENT SCHOOL SCHOOL

TRADITIONAL METHOD	CONVERGENT-DIVERGENT METHOD
08	19

The table 1 shows the mean score of Carmel Convent School for all students in the two groups selected for the one treatment in each group, with the mean scores are 08,19.

Graphical representation of Mean score of Carmel Convent school

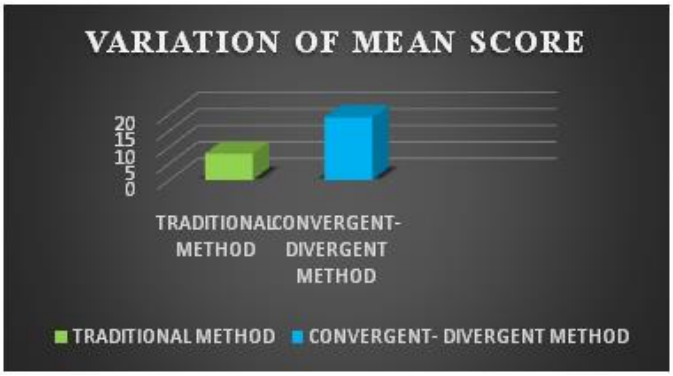


Table 2 Post test Results

	CONTROL GROUP	EXPERIMENTAL GROUP
MEAN	8	19
STANDARD DEVIATION	2.16	1.07
NO. OF STUDENTS	17	17
VALUE OF 'Z'	17.74	
DEGREE OF FREEDOM	(N_1+N_2) -2 = 32	

Reading of the critical values of 't' at 5% and 1% level of significance from the 't'distribution table by using 34 as degrees of freedom. At 5% level critical value of 't' = 2.05 and 1% level of significance, t = 2.76.

The computed 't' value is 17.74. It is much more than the critical values at both the 5 per cent and 1 per cent levels of significance. It should thus be taken as quite significant. Post- test results of students (Carmel Convent schoolDurgapur) of west Bengal were analysis properly.

VI. CONCLUSION

The findings demonstrates that activity driven social constructivist approach can represent a useful pedagogical tool to aid students in the learning process. The development and implementation of this type of pedagogical activity also enabled the teacher to develop required teaching competencies and these abilities affected the way in which the teacher conducted the classes and facilitated student learning in formal and informal setting.

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