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UTILIZATION OF GEOSPATIAL INFORMATION TO RAISE ENVIRONMENTAL AWARENESS IN REALIZING THE NATION CHARACTER

As Paper Presented

Head of IGI

Prof. Dr. Suratman Worosuprojo, M.Sc

Head of Committee

Dr. Chatarina Muryani, M.Si

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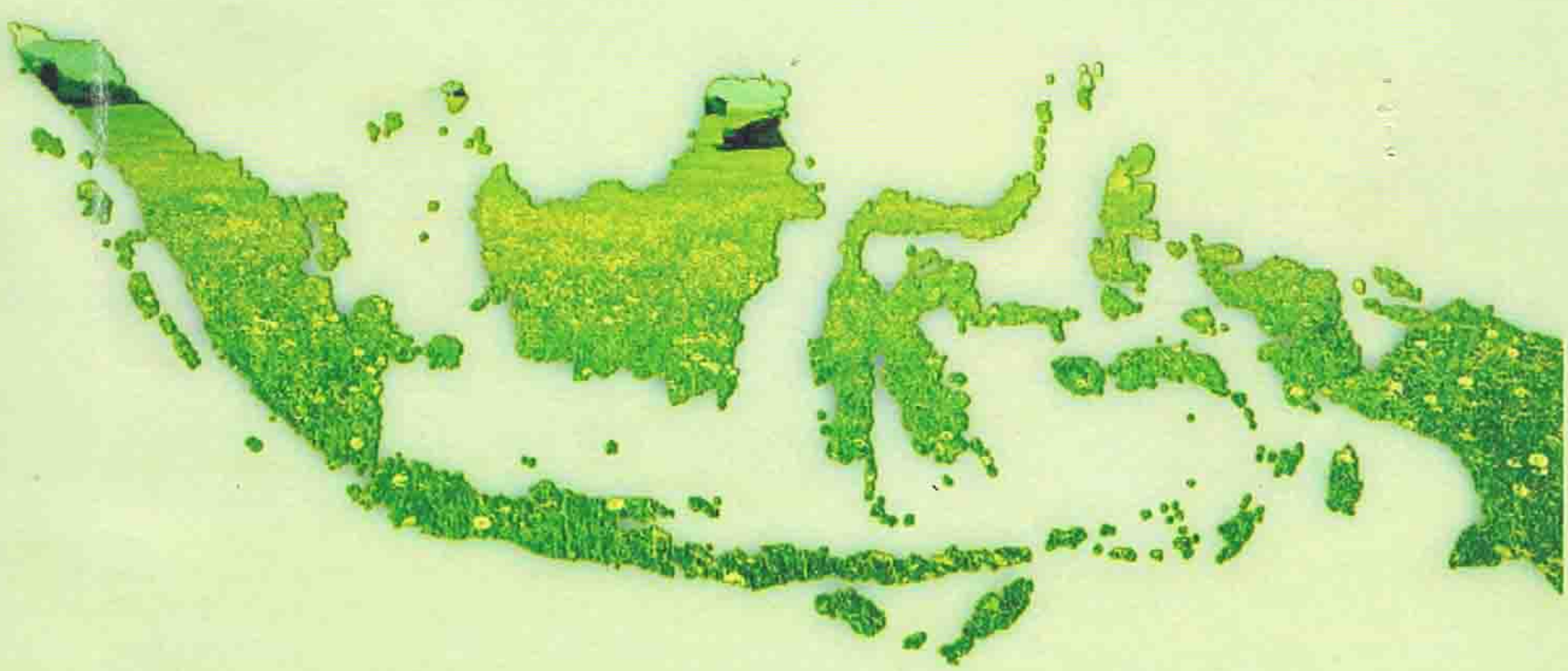
"Utilization of Geospatial Information to Raise Environmental Awareness in Realizing The Nation Character"



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Reviewer:

Dr. Udo Nehren (Cologne University)
Dr. Patrick Wassmer (University de Strasbourg)
Dr. Chistopher Gomez (University of Conterbury)
Prof. Dr. Suratman WS, M.Sc (Gadjah Mada University)
Prof. Haris Mudjiman, M.A,Ph.D (Sebelas Maret University)

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YUMA PERKASA GROUP
Bekerja dan Berkarya

PREFACE

Thank God for we have managed to compile this International Seminar Proceedings. International Seminar entitled "The Use of Geospatial Information for Developing the People Environmental Awareness in order to build the Nation Character" was held on 3 to 4 November 2012 as a program for IGI's Annual Meeting XV.

The natural resources decrease continuously due to management that ignores sustainable development principals. The environmental damage symptoms which happened lately are signs that the development process has been approaching the limit of supporting and carrying capacity of the environment. The environmental damages which are getting worse lately trigger the natural disaster such as flood, landslide, climate change, and others.

Geospatial information is one of important roles on geographic study, since geography characterized by spatial approach. Geospatial information is also able to provide information as the basic of analysis and direction for better environmental management. As the result it can limit the possibility of natural disaster for now and the future.

For the success of the international Seminar we would like to thank:

1. Chairman of IGI
2. Rector of Sebelas Maret University
3. Head of BIG
4. Main Speakers, Supporting Speakers and all of Seminar participants

We are very sorry for any shortcomings. Thank

Surakarta, May 2013

The Committee

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IMPLEMENTATION OF COOPERATIVE LEARNING TO IMPROVE DECLARATIVE AND PROCEDURAL KNOWLEDGE UNDER GRADUATE IN SPATIAL ANALYSIS

ENDANG SURJATI*, PARJITO* AND DARWIN PARLAUNGAN LUBIS**

* Lecturer of the Faculty of Teacher Training and Education, University of Kanjuruhan Malang

** Lecturer of the State University of Medan

Abstract

Instruction strategy in cooperative learning have been designed to raise the learners competence in good team work and construct learners interaction each other. This model based on lesson teory both of information processing dan cognitive theory of learning. In fact, this model can help to direct the learner easily to process about information have been accepted. It can be say, because the encoding process will be supported with interaction activity in coopertaive learning. Cooperative learning type STAD (Student Team Achievement Division) developed to handle each group who have a heterogen of academic skills. Cooperative learning type STAD devide class in the groups. The groups describes member with the heterogen academic skill such a good competence, middle competence and low competence.

There is a fundamental difference between declarative and procedural knowledge. Declarative knowledge refers to factual knowledge and information that a person knows. Procedural knowledge, on the other hand, is knowing how to perform certain activities. Procedural knowledge, also known as imperative knowledge, is the knowledge exercised in the performance of some task. Procedural knowledge is different from other kinds of knowledge, such as declarative knowledge, in that it can be directly applied to a task. For instance, the procedural knowledge one uses to solve problems differs from the declarative knowledge one possesses about problem solving because this knowledge is formed by doing. Declarative knowledge involves knowing that something is the case Declarative knowledge is conscious; it can often be verbalized. Metalinguistic knowledge, or knowledge about a linguistic form, is declarative knowledge.

This research specially to know significance rate of implementation of cooperative learning to improve under graduate declarative and procedural knowledge. Multiple Correlation used to analize association between criterion and predictor variable. Based on this research, there is association between cooperative learning type STAD and knowledge declarative and procedural in spatial analysis. This conclusion have been regarding result of significance test reach to 0,56.

The result of research indicate cooperative learning type STAD can improve under graduate competence in spatial analysis. Both of declarative and procedural knowledge can be developed with this model. Cooperative learning is an approach to organizing classroom activities into academic and social learning experiences. It differs from group work, and it has been described as "structuring positive interdependence". Students must work in groups to complete tasks collectively toward academic goals. Unlike individual learning, which can be competitive in nature, students learning cooperatively capitalize on one another's resources and skills (asking one another for information, evaluating one another's ideas, monitoring one another's work, etc.). Furthermore, the teacher's role changes from giving information to facilitating student's learning. Everyone succeeds when the group succeeds.Successful cooperative learning tasks as intellectually demanding, creative, open-ended, and involve higher order thingking tasks.

Keywords: cooperative learning, declarative knowledge, procedural knowledge

Introductory

The success of the learning process is determined by several factors, one of which is the learning model used. Learning model is an approach used in learning strategy to achieve competence learners. One model of learning that can be used is cooperative learning. Cooperative learning is a teaching strategy that is designed to teach teamwork and interaction among learners. This model is supported by learning theory and cognitive information processing theory of learning. In practice this model help direct students to more easily process information obtained, because the encoding process will be supported by the interactions that occur in cooperative learning. Cooperative learning reflects the view that human beings learn from their experience and active participation in small groups to help students learn social skills. Meanwhile, the acquisition of knowledge is done simultaneously will develop democratic attitude and logical thinking skills.

This study uses cooperative learning type STAD (Student Team Achievement Division), this type is developed to deal with each group having a heterogeneous academic ability. Type STAD cooperative learning

study groups divide into small groups who are members of a heterogeneous group in academic ability. In one group there will be a high ability students, two men and one student abilities were more capable low

Determination of the learning model as presented above in accordance with the characteristics of the students studied. Students Prodi Kanjuruhan Geography University of Malang have academic ability is heterogeneous because it comes from several tribes and regions. These differences sometimes lead to a sense of lack of confidence and the perceived difference in receiving information.

. The earth assessment carried out by using the earth's formal and material objects. The field of geography is characterized by the approaches (formal object) is used to assess the earth. The approach distinguishes geography with the other areas of earth science and not shared by other disciplines. This approach is known as spatial approach (spatial approach). Approach is the perception of the spatial position of objects on the surface of the earth. There are three approaches in the study of the earth that is spatial, regional, and ecology

The three approaches mentioned above is the strength of the field of geography. Therefore the ability to perform spatial analysis is one of the competencies required for academic skills possessed by students. As an indicator of students' academic skills in spatial analysis is the analysis capabilities of geospatial information

"*Informasi geospasial adalah data geospasial yang sudah diolah sehingga dapat digunakan sebagai alat bantu dalam perumusan kebijakan, pengambilan keputusan, dan/atau pelaksanaan kegiatan yang berhubungan dengan ruang kebumian*" (UU RI No. 4 Tahun 2011; Bab 1 Pasal 1). This law suggests that in doing all activities related to terrestrial space (geospatial) based on competency analysis of geospatial data. As a tool, the geospatial information serves as a communication medium in conveying information about the material object to users of geospatial information.

The logical consequence of the above description is students must be competent to translate geospatial information and to spatial analysis, both inductively and deductively using the geospatial data. To be able to translate geospatial data required supporting factors, namely: the ability to read symbols, understand the elements of geospatial data interpretation, understanding of knowledge that supports the associated data Geosphere, critical thinking, and mastery of the "mental map". The ability of the above are sometimes not wholly owned by the learners, but only some or part of it.

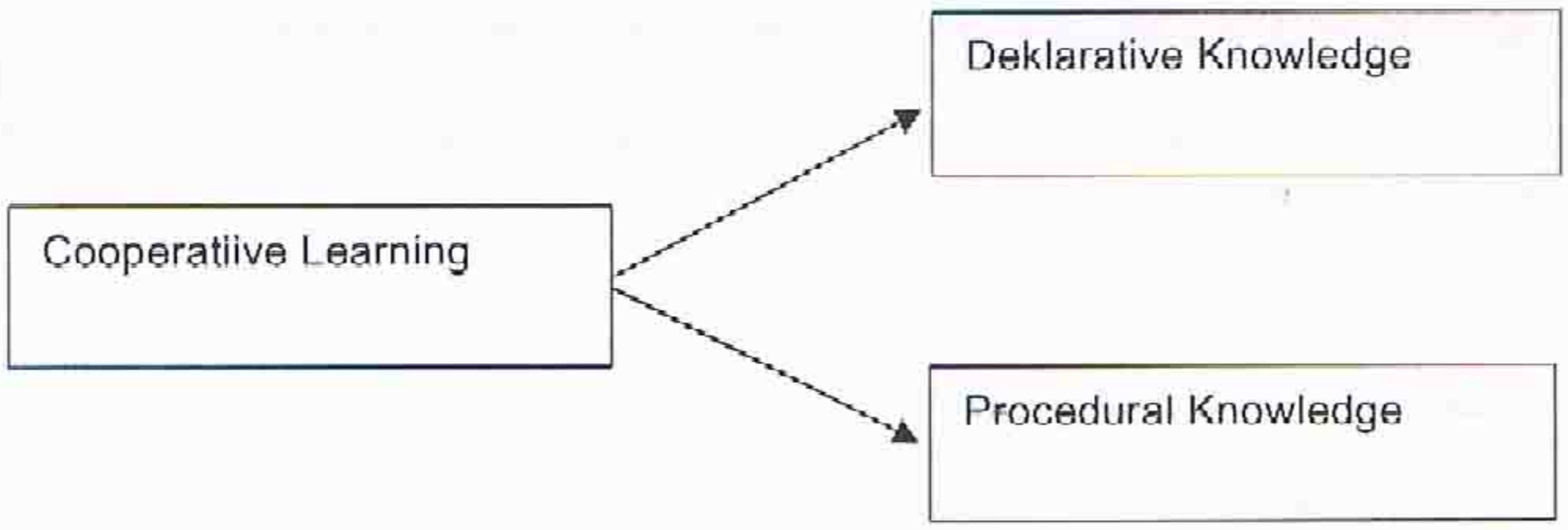
The practice of aerial photo interpretation have competence how the process of making geospatial information and how to utilize geospatial data. So that declarative and procedural knowledge should be transferred to the students. Declarative knowledge expressed knowledge of what it is, whereas procedural knowledge is knowledge of how to do something. In addition, some differences between declarative knowledge and procedural knowledge are: knowledge deklarative relatively static whereas procedural knowledge is more dynamic. Declarative knowledge can be communicated verbally, whereas procedural knowledge can not.

Cooperative learning reflects the view that human beings learn from their experience and active participation in small groups to help students learn social skills. Meanwhile, the acquisition of knowledge is done simultaneously will develop democratic attitude and logical thinking skills.

Here are some formulation of the problem which is used as the basis for the implementation of the study are: (1) How is the implementation type STAD cooperative learning to improve student declarative knowledge to improve spatial thinking skills, (2) how the implementation type STAD cooperative learning to improve student procedural knowledge in improving spatial thinking, and (3) how the implementation type STAD cooperative learning to improve knowledge of declarative and procedural knowledge of students to improve their spatial thinking. While the research objectives to be achieved are: (1) To determine the significant level of implementation of cooperative learning in improving students declarative knowledge in spatial analysis, (2) To determine the significant level of implementation of cooperative learning to improve student procedural knowledge in spatial analysis, and (3) To determine the significant level of implementation of cooperative learning to improve knowledge of declarative and procedural knowledge of students in the spatial analysis.

Methods

This study was to determine the effect of the implementation of cooperative learning type STAD to increase student knowledge in declarative and procedural spatial analysis. Predictor variables in the form of declarative knowledge and procedural knowledge, while the criterion variable was the type STAD cooperative learning. Students are placed in small groups (or teams). The class is presented in its entirety with a lesson and the students are subsequently tested. Individuals are graded on the team's performance. Although the tests are taken individually, students are encouraged to work together to improve the overall performance of the group.



Objectives of this study were all students of Geography Education Program University of Malang Kanjuruhan majors Practice Interpretation of aerial photos. The population in this study were all students who attend the practice at the time of data collection. While the study sample is taken against students who are actively involved in following the practice at the time of data collection.

Research process

The measures that will be conducted by researchers at the time of the study are as follows.

(1) Conducting studies inductively that are closely linked to the problem to be solved.
(2) Identify and define the problem.
(3) Conduct a literature study and some relevant sources, formulate hypotheses, define variables, and formulate an operational definition and the definition of the term.
(4) Make a plan in which the study include the following activities:
   a) Identify external variables that are not needed, but allows the contamination process of experimentation;
   b) Determine how to control the variables;
   c) Selecting an appropriate research design;
   d) Determine the population, selecting a sample (sample) representing and selecting a number of research subjects;
   e) Dividing the subjects in the control group and the experimental group;
   f) Make the instrument, validating the instrument and perform a preliminary study in order to obtain an instrument that meets the requirements to take the necessary data;
   g) Identify the data collection procedures and determine hypotheses.
(5) Conducting experiments.
(6) Collect raw data and experimental processes.
(7) Organizing and describing data in accordance with predetermined variables.
(8) Analyze the data and to test the significance of the relevant statistical techniques to determine the significance of the results phase.
(9) Interpret the results, formulating conclusions, discussion, and report generation.

To determine the effect of the implementation of learning kooperative type STAD on declarative knowledge and procedural knowledge using parametric correlation multivariate statistical techniques (Salladien, 2008)

Result and Analysis

1. Description of Learner Characteristics

Table 1. Description of learner characteristics

Information Categories	Data Sources	Learner Characteristics
1. Entry behaviors	Observations Test Data: Posttest performance from group membership training	Performance setting: Learners have no prior experience as spatial analysis, and most have no prior experience in serving as the leader in problem solving discussions Learners have had no formal training in problem solving through interactive discussion Learning setting: Learners have successfully competence to spatial analysis for group members in problem solving interactive discussions.
2. Prior knowledge of topic area	Observations	Learners have general knowledge of the group leadership area from participating as members in the group discussions . Mereka telah mendapatkan pengetahuan mengenai informasi geospatial meskipun hanya sebagian. Mahasiswa juga juga sudah mendapatkan pengetahuan mengenai kartografi. many of the skills required to be effective discussion leaders.
3. Educational and abllity levels	Test Data: Posttest performance from group membership training	Education levels: Learners vary in their culture, gender, dan knowledge level Ability levels: beside academic progress, learners interpersonal skills are a concern. Based in experiences in the prior "group member" training, it seems that learners are heterogenous with some high in interpersonal skills, some moderate, and some low. Declarative and procedural knowledge students can not be increased in line.
4. General group characteristics 1 Heterogeneity 2 Size 3 Overall impressions	Observation	Heterogeneity: Learners are extremely heterogenous in that they come from various neighborhoods throughout a city, represent a mix of gender, and culture backgrounds Size: There will be a total of thirty five learners per training site to maximize learning efficiency for live group interactive work. Overall impressions: Instruction will need to be efficient, effective and convenient or "volunteer" participants may choose not to read material or attend all group sessions.

Source: Field Research (2012)

2. The Implementation Of Cooperative Learning To Improve Declarative Knowledge Of Learners In The Spatial Analysis

Based on the survey results revealed that there were less convincing effect between type STAD cooperative learning by increasing student declarative knowledge in performing spatial analysis. Several things can affect these conditions are: the existence of a heterogeneous group members so that the ability of each personal too heterogeneous. Prior to the partnership they already have the ability to start different. Some students have high academic skills and others have low academic skills

Lecturer direct student to lesson or reading assignment with instructions to learn information, concepts, or skills. Little is said to the learner about how to go about learning. Recent research focused on analysis spatial has shown that explicit instruction in strategies for effective thingking and learning rarely

accours in classrooms. Similarly, it is assumed, that repeated attempts to learn or to solve problems will automatically result in improvement of general ability to reason or solve problem; little is taught about ways of going about solving the problem.

It is important to remember that declarative knowledge has to be present to form procedural knowledge, but it shouldn't be the only type of knowledge taught. Learning the declarative knowledge helps set the stage for the procedural knowledge. Teaching students to use the facts and information they have gained in context helps ensure long term retention.

Below the benefit of emphasing declarative knowledge:

1. Reliant on authoritative Instruction
2. Lends itself to Elaborate Grading system and ability groupings.
3. Fosters dependency, Tell me what to do and think attitude
4. Easily forgotten
5. Stifiles creativity and discourages independent problem-solving and strategy building.
6. Teacher's role as dispenser and arbiter of knowledge

Declarative knowledge is further divided into:

- Episodic knowledge: memory for "episodes" (i.e., the context of where, when, who, etc); usually measured by accuracy measures, has autobiographical reference.
- Semantic knowledge: Memory for knowledge of the world, facts, meaning of symbols, etc. (e.g., knowing that the anchor is symbol of the port and not the beach).

3. The Implementation Of Cooperative Learning To Improve Procedural Knowledge Of Learners To The Spatial Analysis

Based on the results of the study there was no effect between cooperative learning STAD type with knowledge prosedual. This happens because procedural knowledge is knowledge of how to do the work is strongly influenced by a person's motivation and declarative knowledge.

This research indicates that even good learners know very little about techniques they might use to remember better the material they are studying. Nonetheless, one way successful learner and more educated persons differ from the less successful and less educated is that they are likely to know and use learning techniques more sophisticated than rote repetition. For example, only good analist at college level are able to adjust their competence of analysis to the purposes for which they are spatial analysis. Although it would be difficult to set minimum competency standarts for learning skills, it is clear that there is room for improvement; Even good students have a limited repertoire of such skills, and others have fewer still.

Instructors at the college level, especially in under graduate and open admissions colleges, complain that learners have great difficulty managing and evaluating their own learning efforts. This research to define basic competencies for geospatial learners includes competencies in general reasoning, problem spatial and solution, spatial thingking, and spatial learning skills.

Any skill being learned starts out as declarative knowledge. For example, when learners were learning about geospatial, learner learned all about the symbols, where to look for legend or another map components, how to analize the spatial different. This is a set of factual information. Putting those facts into practice helped them gain the skills to transform a series of declarative knowledge into procedural knowledge. The skills they acquired couldn't be learned simply by being told. Learner gained the skills only after actively putting them into practice and being monitored by a lecturer who was constantly providing feedback.

There is good reason to try improve the characteristics of individual as learners. Most commonly, educational research attempts to improve instructional techniques in general or in specific subject matter areas especially at spatial thingking. That research at the college level indicates that truly different methods of instruction – lecture, discusiion, reading, problem solving – have negligible effects on learner performance, whereas there are large individual differences in learner performance.

Pattern recognition involves identification of map component, spatial interaction, symbols, etc. The visual system does more than just interpret forms, contours and colors. Pattern recognition refers to the process of recognizing a set of stimuli arranged in a certain pattern that is characteristic of that set of stimuli. Pattern recognition does not occur instantly, although it does happen automatically and spontaneously.

Spatial analysis, the sensory system breaks down the incoming stimuli into its features and processes the information. Some features may be more important for recognition than others. All stimuli have a set of distinctive features. Feature analysis proceeds through 4 stages:

1. Detection
2. Pattern dissection
3. Feature comparison in memory

4. Recognition

4. **The Implementation Of Cooperative Learning To Improve Declarative And Procedural Knowledge Of Learners In The Spatial Analysis**

After consultation with r table there is the influence of the cooperative learning with declarative and procedural knowledge. Table value at 5% significance level is 0.227, while r count was 0.56. Since r count r is greater than the table it says there is an influence.
It can be understood that in implementing geospatial data interpretation is required for cooperation group to get a whole perspective correct conclusion. Differences in ability and knowledge was very supportive in this regard.

Bellow are factors into consideration when determining the amount of information to be presented: jelaskan

1. The age level of learners
2. The complexity of the material
3. The type of learning taking place.
4. Whether the activity can be varied, thereby focusing attention on the task
5. The amount of time required to include all the events in the instructional strategy for each sluster of content presented.

The context in which they will learn the skills, and the context in which they will use them. Learners' current skills, preferences, and attitudes are determined along with the characteristics of the instructional setting and the setting in wich the skills will eventually be used. This crucial information shapes a number of the succeeding steps in the model, especially the instructional strategy.

Based on the instructional analysis and the statement of entry behaviors, it will write specific statetements of what the learners will be able to do when they complete the instruction. These statements, which are derived from the skills identified in the instructional analysis, it will identify the skills to be learned, the conditions under which the skills must be performed, and the criteria for successful performance.
A complete goal statement could be describe the following: Jelaskan

a. The learners
b. What learners will be able to do in the performance context
c. The performance context in which the skills will be applied
d. The tools that will be available to the learners in the performance context.

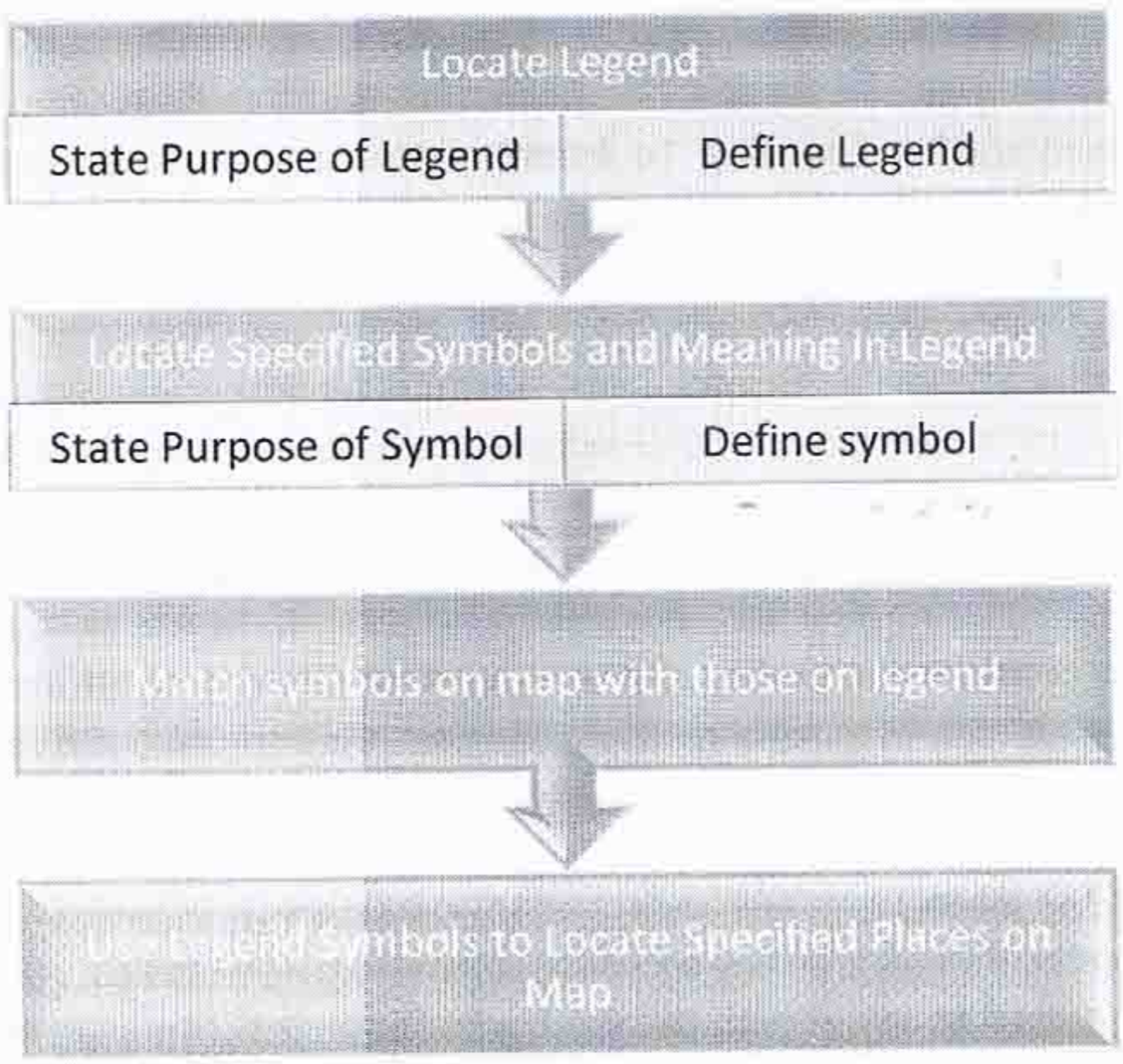
In essence, verbal information goals require the learners to provide specific response to relatively specific questions. It usually spot a verbal information goal by the verb that is used. Often the learner must state, list, or describe something. It is assumed that the "something" that is to be stated or listed will be taught in the instruction; therefore, the learner is storing the information during the instruction and retrieving it for the test.

Intellectual skills are those that require the learner to do some unique cognitive activity—unique in the sense that the learner hierarchical analysis for an intellectual skill. Similary to map skill, that demonstrate ability to do a hierarchical analysis by identifying the subordinate skills required to perform each of the four main steps for the following instructional goal on map reading.

Picture 1. Use a map of that town to locate specific places and determine the distances between them.

To aid the analysis, it may wants to obtain a copy of local city map and use it to perform each of these main steps. As it work, note what tasks it must perform and what information and skills its need to perform each one.

Picture 2. Use Legend Symbols to locate Specified Places on Map



One of the more abstract demands placed on the graduate level is asking them to relate cities, states and countries to their spatial representation on maps. Learner have directly experienced region beyond the immediate neighborhood as physical realities, so their geographic relationships develop gradually. For most learners these regions are only "things" they see on the map. The map itself becomes an abstract representation of something they have never seen before, so learner are asked to learn about geographic features of countries from symbols on maps, which lecturer then attempt to explain. The reading of maps requires a bird's eyes perspective of spatial relations. Learner's spatial relations are coordinated gradually and their experience doesn't include many opportunities to consider this usually perspective. Map contain fewer recognizable details than photographs and lack a one-to-one correspondence with reality. In a map of a neighborhood, familiar landmarks such as trees are the first details to go and the remaining landmarks represented by color-coded dots and squares are no longer recognizable as churches and schools. Map also contain abstract reference systems such as grids which are not part of soncrete reality.

Mapping activities can be challenging but not unrealistic in their demands on learner's capacities. Rather than beginning with map symbols and attempting to explain their meaning to learner, it is possible to give learner opportunities to explore actual object which are represented by symbols on maps. These are only some of the mapping experiences that are appropriate challenges and that help to bridge the gap between concrete reality and abstract representation. It will require further concrete experience to deal with the complexities of scaling and the abstraction of longitude and latitude lines found on geographer's maps.

5. Advantages of Cooperative Learning

Cooperative learning requires learners to engage in group activities that increase learning and adds other important dimensions. The positive outcomes include: academic gains, improved race relations and increased personal and social development. Learners who fully participated in group activities, exhibited collaborative behaviours, provided constructive feedback and cooperated with their group had a higher likelihood of receiving higher test scores and course grades at the end of the semester. The cooperative learning is an active pedagogy that fosters higher academic achievement. Cooperative learning has been found to also increase attendance, time on task, enjoyment of school and classes, motivation, and independence.

The 5 basic and essential elements to cooperative learning:

1. Positive interdependence
   - Learners must fully participate and put forth effort within their group
   - Each group member has a task/role/responsibility therefore must believe that they are responsible for their learning and that of their group
2. Face-to-Face Promotive Interaction
   - Member promote each others success
   - Learners explain to one another what they have or are learning and assist one another with understanding and completion of assignments
3. Individual and Group Accountability

- Each learner must demonstrate master of the content being studied
- Each learner is accountable for their learning and work, therefore eliminating "social loafing"

4. Social Skills
   - Social skills that must be taught in order for successful cooperative learning to occur such as leadership, decision-making, trust-building, communication, conflict-management skills
   - Skills include effective communication, interpersonal and group skills
5. Group Processing
   - Every so often groups must assess their effectiveness and decide how it can be improved

Conclusions

Several conclusions can be drawn based on the results of the study are as follows:

1. There is no effect between cooperative learning STAD type with declarative knowledge
2. There is no effect between cooperative learning STAD type with procedural knowledge
3. There is the influence of the type STAD cooperative learning with declarative and procedural knowledge with a significant level of 0.56. In order for learner achievement to improve considerably, two characteristics must be present:
   a) Learners are working towards a group goal or recognition.
      When designing cooperative learning tasks and reward structures, individual responsibility and accountability must be identified. Individuals must know exactly what their responsibilities are and that they are accountable to the group in order to reach their goal.
   b) Success is reliant on each individual's learning.
      Positive Interdependence among learners in the task. All group members must be involved in order for the group to complete the task. In order for this to occur each member must have a task that they are responsible for which cannot be completed by any other group member.

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