Multi-Scale Geography Lesson using the Concept of Geographical Scale: 
For Better Dynamic Geography Lesson

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**Abstract**
This article attempts to clarify the significance of a geography lesson through the use of the concept of geographic scale. Geographical scale attaches great importance to the formation process of a space, so it is a concept that incorporates the possibility of presenting an area more kinetically. Of course, this is not meant downplay the importance of two other scale concepts. First, the concept of a multi-scale is also important in catching the versatile nature of a community. It is particularly important in studying what type of influences this scale has on students, because when using this type of scale a student can actively grasp and change the actions on the communities on the scale itself. In addition, a student can look not only at one area on various scales, but also it is important for him or her to grasp the relations between various scales. Finally, it is important to create a sense of place among these plural scales in the students in order for them to gain a sense of belonging or citizenship to the various communities, which is one of the ultimate aims of a social studies curriculum.

**I Introduction**
In geography, as in all sciences, there can be no research done without the use of the concept of scale. Of course, in recent years the study of scales has attracted a great deal of attention in the field of geography (Marston, 2000; Onjo, 1999; Yamazaki, 2005), and the concept of scale in human geography has been profoundly transformed over the past 30 years.

In geography lessons for social studies classes, teachers can set a standard for students in which they should arrive at an answer on a scale corresponding to a certain question as a clue to judge how precisely the scale has answered
the question that was posed by a either a teacher or other learners. It is an important geographical skill that a student should be able to find an answer on an appropriate scale, which represents a choice that demonstrates both proof understanding of the relationship between the answer and the content of the question in accord with a chosen scale. Conversely it is necessary for the teacher to pose a question to a learner after making it clear whether this question that demands an answer using a certain scale. At the same time, we may regard these concepts as skills that are essential in a social studies class. In order to address the concept of the scale from this viewpoint, there are various studies that the current proposal that is going to incorporate into an approach for the multi-scale in a curriculum (Hihara, 2005; Yoshimizu, 2008), as well as the results of research that have incorporated the approach of the multi-scale in a class (Ito, 2010; Yoshimizu, 2011; Hanioka, 2011).

The social sciences are subjects that attach great importance to contents, and the scale is a key geographical concept representing the main background of research that advances geographic learning. In the case of learning geography, the concept of the scale should not be understood only as a concept that is part of a method. Based on results of research in social science that include recent studies on geography, it is pointed out that we shouldn’t understand a scale as a simple concept as part of a method and rather should approach it as a concept including the associated essential contents of a certain phenomenon with which that scale is connected. In other words, we need to grasp the concept as a geographical scale (Taylor, 1982; Onjo, 1999; Yamazaki, 2005; Koujimoto, 2008). The concept of the geographical scale is affected by “production of the space” (Lefebvre, 1974) that is a way of thinking “to form the space where the change of the political economy in the capital system society has a specific geographical characteristic.” Core concepts such as regionalization and scene in geography assume the existence of a real process as the formation of the space with others and address specific characteristics that we can place in this space. If we take this concept, it means we must select a unit of space formed through a specific social process to choose the scale as the spatial expanse. It is important that in classroom practice, we use the concept of the geographical scale to enhance learner understanding that “areas” targeted for learning were produced through this concept of space, and are not simply a set of data. A study of social studies pedagogy using the viewpoint of this type of “production of the space” includes the concepts outlined in Nagata (2009). Nagata classifies geographical educational practices in the liberal education period as having “representation model practice of the space”, “space model practice of the representation”, which are three of the spatial concepts in the
framework that assumed “production of the space”, which was common a viewpoint in the Taisho era. Using this framework in an analysis of the home economics curriculum in Asakusa elementary schools, we can see that the method of the formation of space formation in these lessons carries with it an opinion that existed in education during the early days of the Showa period. This was a kind of local patriotism practiced in the early days of the Showa era that carried “space-shaped practice of representation” that has been lost in geography education but should be of interest to those who study this field.

In a similar vein, when we present geography in social studies classes, we need to think about the manner in which to handle the relationships between multi-layered scales. The geographical phenomena that need to be focused on are different in local scales, such as the seven district divisions in the Kanto area, and in national scales, such as for the country of Japan. In cases where the scale comprises different states, such as Asia the methods of learning are different from that which is intended for small areas, such as the immediate area around a school. Though often one finds that a district scale used for learning distorts the meaning of the geography that a student is trying to comprehend. For example, if a student uses a map on a scale of around 1:1,000,000 and should be learning what would be outlined in the area of the small scale on a map from 1:50,000 to 1:200,000 this would distort what actually belongs to the district and deserves to learned in sequence. Therefore, there is a tendency that almost none of the local characteristics of the local scale that a student should be able to grasp are clearly seen. This was indicated by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) in 2008. However, if we cannot incorporate the concept that a certain phenomenon progresses and develops on each scale, and additionally this happens on certain scales at the same time, the problem indicated above cannot be solved.

We need to examine what type of learning can capture the relations between an existing scale hierarchy that is multistoried in this way? Therefore, in this study, the concept of the geographical scale it used to explain the process of the scale generation. Moreover this study aims for a model presentation of geography learning that clarifies the relations between societal phenomena on a multi-scale.

From these conditions and critical thinking, this study presents ideas related to the following procedures.

a) Three meanings of the scale are arranged and the effectiveness of the concept of the geographical scale is clarified.

b) The effectiveness of the approach of the multi-scale is clarified.

c) A viewpoint that incorporates the approach of a geographical scale and
the multi-scale in the making of class effectively is shown.

II Three meanings of the scale

1 Cartographic scale and methodological scale
When the concept of the scale in the geographical context is outlined, the explanation by Smith (2000) is often used. Smith classifies scales according to the following three categories in the *The Dictionary of Human Geography*.

a) cartographic scale
b) methodological scale
c) geographical scale (Smith, 2000)

The cartographic scale refers to the abstraction level on a map. In other words, it means it has a relationship that acts to decrease the concreteness (resolution) of the things that are expressed on a map so that the reduced scale of the map is compressed.

A methodological scale refers to the spatial units that are chosen to express information that a researcher shall use and represents a specific research theme; for example, statistics from wards, cities, and area districts in the national census. The choice of scale then would be decided based on the theme of the research, the availability of data, and the cost of its acquisition and operation. The choice of the cartographic scale is often decided based on its relationship with a methodological scale.

The use of these two scales incorporates an important methodological point. In addition to research done in geography, researchers in all fields must be careful about the type of scale used for a particular study, and appropriate use of scale will enhance the research done in these studies. Ukita (1970, 1995) and Takahashi (1988) have pointed out the importance of these two scales.

2 Production of space and the geographical scale
The geographical scale indicates the dimensions of a specific scene such as a city, a river basin, or the earth. In other words the contents of a geographical scale indicate a specific concrete process that shows a physical/human landscape rather than an abstraction. On that point, the geographical scale reflects geographical reality rather than other scale concepts (Yamazaki, 2005). In other words, there is a premise that space and time or the organization of these factors is a social product created by society (Onjo, 1999).

In this way, a scale has three meanings. The cartographic scale and methodological scale support geographical skills when a learner uses them to answer a question in class. For example, if a student were to address the
statement “there are many storage reservoirs in the Osaka plains, a climate area in Setouchi with a little rainfall”, they would first want to consider whether this explanation is correct. When thinking about this question from this viewpoint a student must consider both a cartographic scale and the methodological scale. Moreover teachers must consider two things; the first is whether there is an assumption that a learner will answer using a cartographic scale, and if so, how much of the knowledge should come from this scale; the second is what range or scale the teacher should use to evaluate the learners’ responses. The students must engage in a similar thought process to arrive at answers that are correct in the context of the questions posed.

However, the use of a geographical scale does not only include the two issues above, but also entails different theoretical meanings. For example, the process of generation is important to a basin, a commercial domain, and a food chain. These reflect geographical reality. And these are both concepts that incorporate a method of creation and the content of an area or space. This is the point where the concept of the geographical scale contains theoretical meaning. Yamazaki (2005) calls the process when such a space is formed “a spatial process.”

In this study, the concepts of space and time or the organizational structure of an area depend on the logic of a geographical scale that has been created and is social product of a particular society and brings with it a core viewpoint of a particular model of development.

III Approach by the multi-scale

The effectiveness of an approach using a multi-scale has been previously pointed out (e.g., Ukita 1970). To clarify a complicated social device, it is important to base this explanation on the premise that phenomena are multistoried and must be related to various scales; this is because this type of viewpoint makes it possible to more precisely grasp the complicated structure of the social device itself. Not only in the field of geography but also the in humanities and social sciences such as sociology and political science, the approach of the multi-scale has been used (e.g., Kajita, 1996). However, these multi-scale approaches do not use the concepts of a geographical scale.

In relation to the concepts of the geographical scale, an example that used a multi-scale approach was Swyngedouw’s (1997) concept of “glocalization”. Swyngedouw argued that the era in which a national scale controlled other scales through globalization was over, and proposed a re-scale of the national areas of political power (Kojimoto, 2008). In other words on the level of
national scales there is said to be "a retreat of the state" (Strange, 1996) that acts as an authority and functions to control Homo sapiens, a thing; the flow of money is parallel to the globalization retreat and is adjustable. However, on the other hand, an institutional function rises from supranationality, or a global scale, such as the foundation of EU, and this can be understood when one lowers a focus to examine individual and local scales through deregulation and decentralization. Yamazaki (2005) sees a phenomenon in which such a national function and authority undergo changes to both high-ranking and lower scales at in concord with glocalization (Yamazaki, 2005).

In this way, it can be seen that glocalization entails a reorganization of scale from the standpoint of the relationship between the scale and the changes outlined above, which took the approach of the multi-scale. In this study, I rely on the logic of the approach of the multi-scale to read multilayered and hierarchical characteristics of societal phenomena that would exhibit data developing on a variety of scales at the same time. Then this data must be organized from the viewpoint of lesson development.

IV Contents constitution framework for unit development

Above I have outlined an approach using both a geographical scale and a multi-scale. Therefore, based on knowledge gained through the use of these concepts, we can construct a framework that comprises the appropriate contents address in this study. This is done by taking a viewpoint that incorporates approaches using both a geographical scale and a multi-scale.

The geographical scale does not assume a scale a priori, and it is necessary to incorporate development to attach great importance to a spatial process. In other words we compare an area using time axes to fully understand the processes that occur when a certain scale is formed, and then to describe and explain these changes. For example, it was, at most, about one hundred years ago that rice began to be widely cultivated in Hokkaido. In addition, if we are only given the information "that rice growing became popular in Hokkaido", we are unable know the reason why this scale that includes rice cultivation was formed. The formation, transformation process, and phenomenon in which a community expands and matures, as well as the reduction/disappearance from loss to competition between areas need to be addressed. Because in geographical studies there is a large amount of information on spatial processes, descriptions and explanations that capture local movements in the society and economy on time axes are also necessary.

Concerning an approach using a multi-scale, it is necessary to understand whether various scales exist that include multilayer-related/ hierarchal
characteristics; as here the relationship between scales is again different again and entails other types of change. It is necessary for a scale, once it is formed, to incorporate the movement phenomena from other types of scales including scale-jumping (Smith, 2000) and glocalization (Swyngedouw, 1997), thus the scale is expanded to a different scale as it recognizes relations between various scales.

The phenomena involved in multilayer characteristics and spatial hierarchy characteristics are complicated and difficult to portray correctly. However, complicated multilayer characteristics and hierachal characteristics can be seen even in a social structure itself. This is connected to the formation of a concept device that views society through an area and incorporates an analysis constructed by dividing one complicated society into one scale. This is because the method used that divides information on one scale into multilayer-related / hierarchy characteristics is that which incorporates social perspectives.

Policies enacted by countries as a result of pressure from other foreign countries point to the relations between different scales. This is a description and explanation of influence that a national scale exerts on a local scale and a global scale exerts on a national/ local scale. Not only does a larger scale have influence on a small scale, but also the reverse is possible. Of course we must consider that the actions involved in these connections might not be easy to understand, but this needs to be connected to the lesson planning in order let a student think about what kind of influence smaller and larger scales have when trying to understand the relations between different scales.

Following these two viewpoints, the contents below constitute a framework that can be set for learning (Table 1).

<table>
<thead>
<tr>
<th>Viewpoints</th>
<th>Lower viewpoints</th>
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<tbody>
<tr>
<td>The geographical scale</td>
<td>• Spatial process</td>
</tr>
<tr>
<td>Approach by the multi-scale</td>
<td>• Multilayer / hierarchy characteristics of space</td>
</tr>
<tr>
<td></td>
<td>• The relations between different scales</td>
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</tbody>
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Moreover, according to the information above, each item should not remain at a purely description level that only expresses the existence of a phenomenon, but should constitute an explanation that expresses the causation between phenomena.
V A Dynamic Approach to Portray Society: In Conclusion
A dynamic approach here is defined as follows: to catch the movements involved in changing or to portray things connected to a change on the time axes. Social studies education has tried to portray society dynamically; global history and cultural exchange zones in education covering world history education can be a device used to do this. In geography education, to understand the processes involved in local change, and to grasp the relationships between multilayer / hierarchal characteristics of space, the use of a scale is essential. If we want to understand these phenomena, we cannot separate geographical phenomena that are distributed in space from political content that affects it. In other words it is very difficult to understand local change without connecting it to political issues. For example, when we learn about the EU, we take into account important issues that address the political agents noted on various scales such as domestic areas, nations, and plural countries in the EU. The political organization of the EU and the space of Europe have an influence each other. In geography lessons, political phenomena are key concepts in the understanding of spatial phenomena.

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References


