The Image Map Survey of High School Students for Tokyo Metrop Area – How They Perceive Their Urban Environment –

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ABSTRACT:

In order to execute a good urban planning, one should understand how people
However, most of Japanese cities have tendency to neglect how people conceiv
neglect is even stronger toward teenagers, thus making most of Japanese cities

In order to make up for these situations, the research is conducted in order t
school students living in Tokyo perceive their city. The research has applied
Map Study and asked 192 high school students to draw the map of Tokyo.

Findings of the research are as follow.
1) Most of high-school students perceived spatial structure of Tokyo with tra
lines.
2) Most important train line for high school students to image Tokyo is Yamanot
that connects important nodes of Tokyo.
3) 142 students (74%) drew the municipal boundary of Tokyo Metropolitan Gove
maps had the correct shape of Tokyo.
4) Many maps did not have landmarks. Comparing to the number of maps that drew
the number of maps that drew landmarks were much less.

The study result suggests that high-school students have a strong tendency to
spatial structure with train nodes and train paths. In order to make Tokyo mo
higher sense of place for younger generations, it is recommended to improve ac
stations and train paths should be considered more seriously in enhancing its
addition, the lack of landmarks makes Tokyo very dif cult to image spatial st
of landmarks should be enhanced as well as creating new landmarks with a strong

1. Introduction

We, urban planners, urban designers, architects, scholars, were all high sch
However, we forget the past and we often ignore how high school students see
their urban environment when making new urban plans or new urban designs. Th
cities that are planned and designed by adult tend to be unfriendly and not
(Hattori, 2013). This seems to be truer in Tokyo, where economic development
of urban planning especially due to the fact that it will hold the 2020 summer

It is important to plan and design city that corresponds to the need of high s
teens, not because they are the clients of public services including urban pla
they will be responsible citizens in a near future. They need to be attached t
them to harness social responsibility. They need to be involved in city policie
fashion.

There has been a lot of image study of Tokyo mainly from real estate standpoin
to ask which neighborhood do you like to live? or which place do you like t
2012; Ministry of Land, Infrastructure, Transport and Tourism, 2006). However,
of the researches regarding image map study of Tokyo. Teramoto (1985) has conc
map study survey of pre-teen elementary students for Tokyo, however, image m
of Tokyo to teenagers has not made public recently. Following the notion abo
conducted a research in order to understand how high school students living in
city. The research has applied Kevin Lynch s Image Map Study and asked 192 high
to draw the map of Tokyo. This paper summarizes the methodology and ndings of

2. Methodology

The image map study was conducted to 192 students in Tukuba Daigaku Fuzoku
in Bunkyoku-ward in Tokyo. With the help from geography teacher of the schoo
distributed in the geography class in November, 2010. The image map was analy
the methodology developed by Kevin Lynch in 1960. The maps were analyzed from
path, edge, district, node, and landmark.

3. Findings

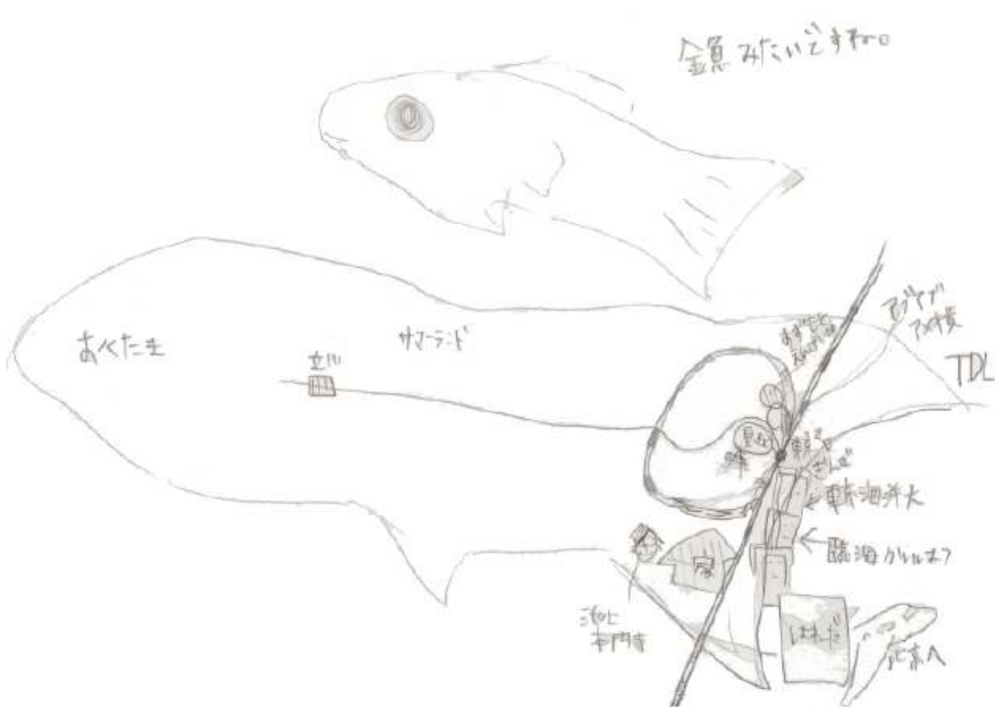
1) Recalled Elements

In this paper, recalled elements indicate things depicted in the image
image maps, 190 separate elements were recalled, totaling 789 indicated ele
neighborhood, landmark that were either written in a proper noun or drawn with
considered as recalled elements. Recalled elements were classified into
train station, arti cial elements (other than train station), school rela
(Refer Table 1).

The elements that were most recalled by surveyed high school students were t
different train stations were depicted in the maps, 453 train stations in tota
61.3% of all depicted recalled elements. This result suggests that surveyed

Table 1. Number of Recalled Elements

	Total Elements	Depicted Elements
natural elements	58	16
arti cial elements	157	33
school related elements	59	13
train station	453	116
Others	29	11
Total	756	189



tend to realize the spatial image of Tokyo through the location of train stat
three respondents depicted the highway in the map. Train stations seem to hav
role for high school students to construct the spatial image of Tokyo than any
This was not a case in other cities that had a similar image map survey (Refer
(1997)). This may be due to a fact that high school students had a good commanc
the city using trains, thus students have perceived the spatial structure of c
network, i.e. stations.

Beside train stations, 47 maps depicted the high school. Since the survey w
high school, some of the surveyed students image the spatial structure of Tok
were at: their high school. Tokyo tower was depicted by 47 maps, followed by s
maps), Sky-tree tower (20 maps), the bay of Tokyo (19 maps), and the Emperor P
Out of 192 maps, 63 maps showed no recalled elements. 9 maps did not depict a
depicted edges despite showing no recalled elements. 5 maps just drew some il
dif cult to consider as landmarks. The average number of recalled elements pe
maximum number of recalled elements in one map was 27.

The above recalled elements were classi ed into Kevin Lynch s ve types: pa
nodes, and landmarks (Table 2). Elements that were most depicted was Nodes w
elements that have been depicted totaled 459. This number is also the highest a
Following text will analyze the ndings by Kevin Lynch s ve types.

2) Paths

Kevin Lynch has de ned paths as follows (Lynch, 1960).

Paths are the channels along which the observer customarily, occasionally, or
They maybe streets, walkways, transit lines, canals, railroads. For many pe
predominant elements in their image. People observe the city while moving thr
these paths the other environmental elements are arranged and related.

Table 2. Number of Depicted Elements, and also the Number of Elements Depi

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Out of 192 maps, 79 maps (41.1% of total) has depicted path. There were 48 maps depicted train lines, and only 5 maps depicted roads. The total number of 219. Out of which, 209 were train lines and 10 were roads. In Japan, high sch have driver license. Therefore, it is natural to assume that these students do image of road network or road structure, however, the fact that just only 5 m strikingly different from Lynch s study of Los Angeles. Out of 77 maps that c 65 maps (84%) depicted Yamanote-line. Yamanote-line was most depicted paths. 58 Yamanote-line as circular, however 7 maps indicated only a partial part of Yam comes Chuo-line with 46 maps, followed by Yurakucho-line (12), Sobu-line(11), (9).

From the result of this survey, one can understand that the high school stude spatial structure of Tokyo by two distinguished paths, Yamanote-line and Chuo- it is easier for them to perceive spatial image by train lines that runs over ground. The interesting nding is that despite the huge number of maps depic the shape of Yamanote-line was not represented in a correct shape. Yamanote-lin east-west, 14.8km width in north-south. So, it is much more oval than circle. M maps drew Yamanote-line in circle shape. Yamanote-line supported many students image of Tokyo, however, the actual image they have with Yamanote-line is very reality it is quite oval.

3) Edges

Kevin Lynch has de ned Edges as follows (Lynch, 1960).

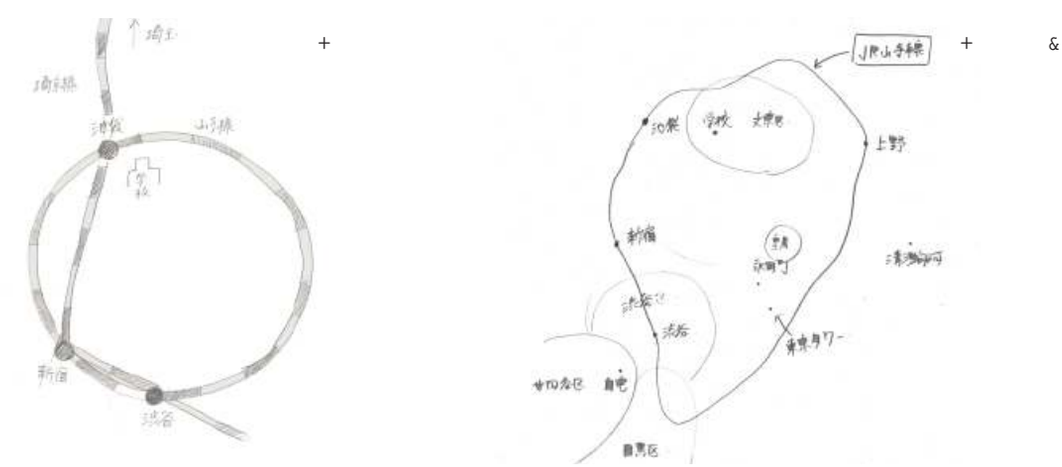

Figure 2. A Map that depicted Yamanote-line in circle (#146) and a map in verti

Edges are the linear elements not used or considered as paths by the obser
boundaries between two phases, linear breaks in continuity: shores, railro
development walls. They are lateral references rather than coordinate axes.
barriers, more or less penetrable, which close one region off from another: or
lines along which two regions are related and joined together. These edge e
probably not as dominant as paths, are for many people important organizing fea
in the role of holding together generalized areas, as in the outline of a city

Of 192 maps, 153 maps depicted Edges. Out of these 153, 142 maps drew the bou
metropolitan municipalities. The boundary consists of both natural edges an
Natural edges such as Arakawa River, Edogawa River, Tamagawa River, and Tokyo
apparent and, thus create strong images. However, only 12 rivers have been in
On the other hand, arti cial boundary is quite dif cult or nearly impossible
is just the demarcation made in the map. Still, the fact that many students we
municipal boundary without that much aw shows that they have been educated o
otherwise) to understand Tokyo s geography.

Some of the maps have depicted the municipality with high precision (#77, #78)
Machida City and rectangular shape of Tokyo Metropolitan municipality that is
and short in north-south are well depicted for most of the maps. 42 maps also d
between 23 wards and others. 10 maps even depicted the boundaries within 23 wa
that were depicted beside municipal boundary are edges between land and water.
the coastline of Tokyo bay. 4 maps showed the edge between mountainous area of
at land.

Many students understand the shape of Tokyo Metropolitan Area, the demarcation
They presumably learned the shape of Tokyo from a map. Thus, it is not what
through the physical or direct experience of the city. It is the image that the

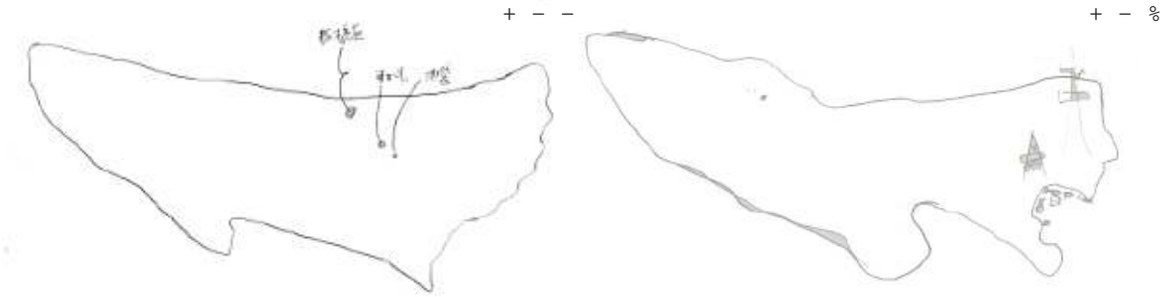

Figure 3. Image Map depicting the correct shape of Tokyo Metropolitan (#77, #7

4) Districts

Kevin Lynch has de ned Districts as follows (Lynch, 1960).

Districts are the medium-to-large sections of the city, conceived of as hav
extent, which the observer mentally enters inside of, and which are recogniz
common, identifying character.

This study considered quite large area such as ward, or forest as a Districts
100 maps (52.1% of total) that depicted district. 325 districts were depicted
was depicted most was Bunkyo-ward with 21. The high school was located in Bun
was easy for students to imagine. Next comes Setagaya-ward with 18. Setagaya-w
of wards in terms of population and size. All wards were drawn but Arakawa-ward
wards that are located in so-called Kawanote Area (Flat area as opposed to H
had only a few students (less then ve) depicted. Students seem to have stro
in the western area than eastern area. This may be due to where students live
number of wards that were depicted.

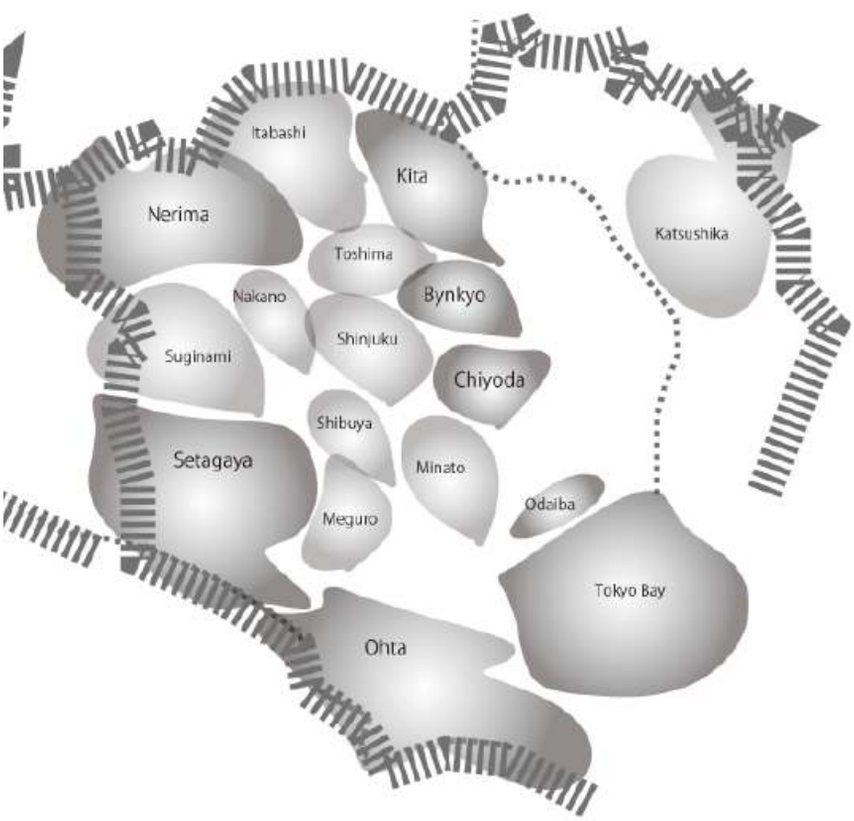

Figure 4. Depicted Districts (Wards)

Beside 23 wards, 10 students depicted Hachiohji City, a large suburban muni
in western part of Tokyo. 10 students drew Chiba Prefecture that is located
7 students drew Saitama Prefecture that is located in the north, and 5 stude
Prefecture that is located in south west. 35 maps depicted the mountain in
Tokyo. Many high school students have image of western side of Tokyo as mounta
or forest. 15 maps depicted Odaiba Area, which lies in the waterfront area
in 1980s. 19 maps indicated Tokyo Bay in the map.

While conducting the survey, students were asked to draw the Image of Tokyo,
of Tokyo Metropolitan Area. However, many students assumed that Tokyo was
Municipal area of Tokyo (i.e. Tokyo Metropolitan Area).

5) Nodes

Kevin Lynch has de ned Nodes as follows (Lynch, 1960).

Nodes are points, the strategic spots in a city into which an observer can
the intensive foci to and from which he is traveling. They may be primarily
break in transportation, a crossing or convergence of paths, moments of shift
another.

All the nodes cited were train stations except one map that drew highway inter
stations were indicated in the map, 452 train stations were depicted in total.
classi ed into train lines of the stations as shown in Table 3. From this ta
that the stations of Yamanote-line have been depicted most. There were 21 Yama

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depicted. Since there are only 29 Yamanote-line stations, more than 72% of t
station has been indicated by the students.

The research found out that high school students also perceived Yamanote-line
to image spatial structure of Tokyo as referred in Path . Table 3 shows tha
that Yamanote-line function as a key image components but also as nodes that
understanding of the spatial con guration of Tokyo.

The train station indicated most was Ikebukuro with 52, followed by Shinjuku
Tokyo (25), and Ueno (16). These are all terminal stations with a lot of user
line, some stations along Chuo-line were depicted frequently, notably Hach
Ochanomizu Station (11), Kokubunji Station (10) and Kichijoji Station (10). Al
transfer stations indicating that for high school students to image the spat
transferring nodes play an important part. Some subway stations were also de
individual stations were depicted, totaling 74. Gogokuji Station and Myogad
adjacent stations from the high school were often depicted with 9 and 8, respec

6) Landmarks

Kevin Lynch has de ned Landmarks as follows (Lynch, 1960).

Landmarks are another type of point-reference, but in the case the observer d
them, they are external. They are usually a rather simply de ned physical ob
store, or mountain. Their use involves the singling out of one element from a
Some landmarks are distant ones, typically seen from many angles and distances
smaller elements, and used as radial references.

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Out of 192 maps, 67 maps depicted landmarks. This is equivalent to 34.9%. 44
indicated, and of total, 187 landmarks were depicted. The most depicted landm
school with 47. This result can be assumed for two reasons. First, it is de n
recognize because of the daily uses. Second, since this survey was conducted
it was easy for them to construct the city image from their existing place. Be
Tokyo Tower was depicted most after the high school with 43 maps, followed by
with 21, Emperor palace with 17, Haneda Airport with 13, and Tokyo Dome with 1
maps that depicted Mount Takao. It is the mountain thati is 599 meters tall loc
downtown Tokyo, and is a popular hiking spot for elementary school student s ex
landmarks that has been depicted, Tokyo Tower really standsout as articulated
#172 and #188 . These image maps put Tokyo Tower in the center of the spatial
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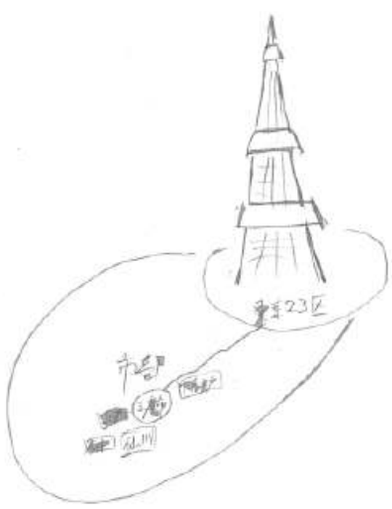

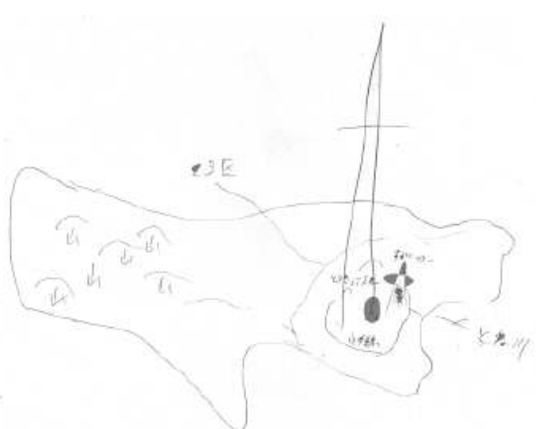

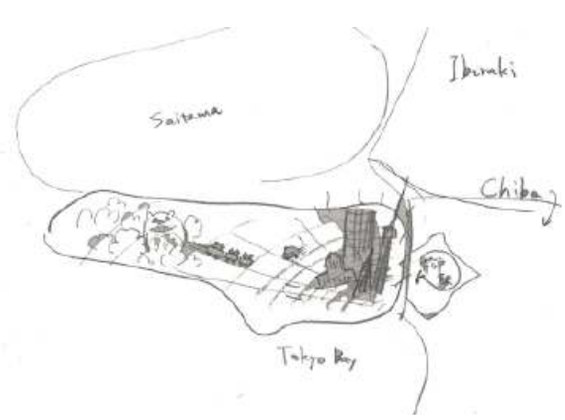

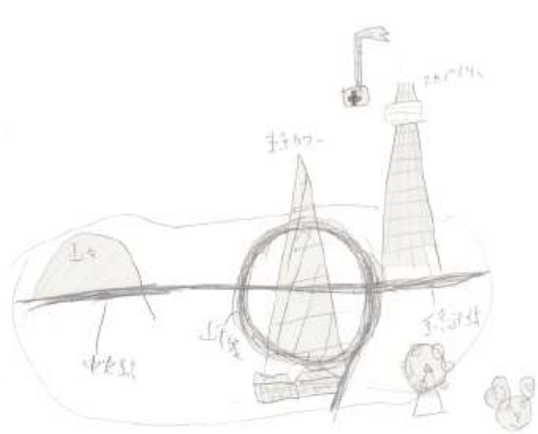

As Lynch noted in his book that landmarks are frequently used clues of identit
are not much landmarks depicted in the surveyed maps implies that many responde
a familiar image of Tokyo. This may be due to the too large of a size of Tokyo
large for high school teenagers to even have a spatial image of the city. The
experience of Tokyo that helps to appreciate the various landmarks of the cit
landmarks are two towers that can be observed from far away, and the more depic
Emperor Palace and Haneda Airport. Emperor Palace is de nitely a quite uniqu
city, but you cannot get in. It has become the landmark with the unique inacc
On the other hand, Haneda Airport function as landmark but also as a node. It
place with a lot of people using it daily. Overall, the survey result implies t
identi able landmarks in Tokyo, at least for teenagers.

7) Correctness in Location and Orientation

There are some inaccuracies in terms of locational arrangement of the landmarks
Yamanote-line has played a significant role in terms of constructing a spati
the students, some respondents were confused how some of landmarks and nodes
accordance with Yamanote-line. For example, map #64 placed the high-school outs
line, and map #53 located Tokyo Station not along Yamanote-line, but in the c
line oval. Map #65 placed Emperor Palace in the site of Meiji Shrine. Perhap
have presumed that Meiji Shrine is where Emperor Palace is. This result implies
were confused with con guration of places and landmarks, Within the inner ova
teenagers move around with subways. Subways will not support you to orient you
easily lost moving underground. This may well be the reason among others.

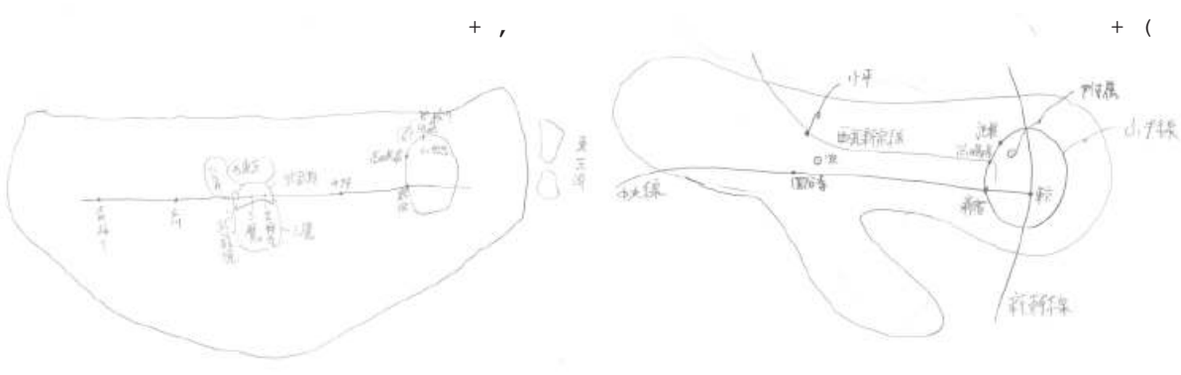

Figure 2. A Map with inaccuracies in terms locational arrangement of the land
(#64, #53)

8) Results

Figure 7 is a diagrammatic representation of its major elements excluding d
from the image map study. Yamanote-Line and some major stations along it st
gure articulates that the image of Tokyo is constructed by Yamanote-Line an
stations as a trunk with the support of Chuo Line and other secondary stations
branches. Landmarks have not played an important role to construct the image
school students with the exception of Tokyo Tower, Skytree Tower and Emperor Pa
Airport. This result may indicate that Tokyo lacks landmarks that identify the

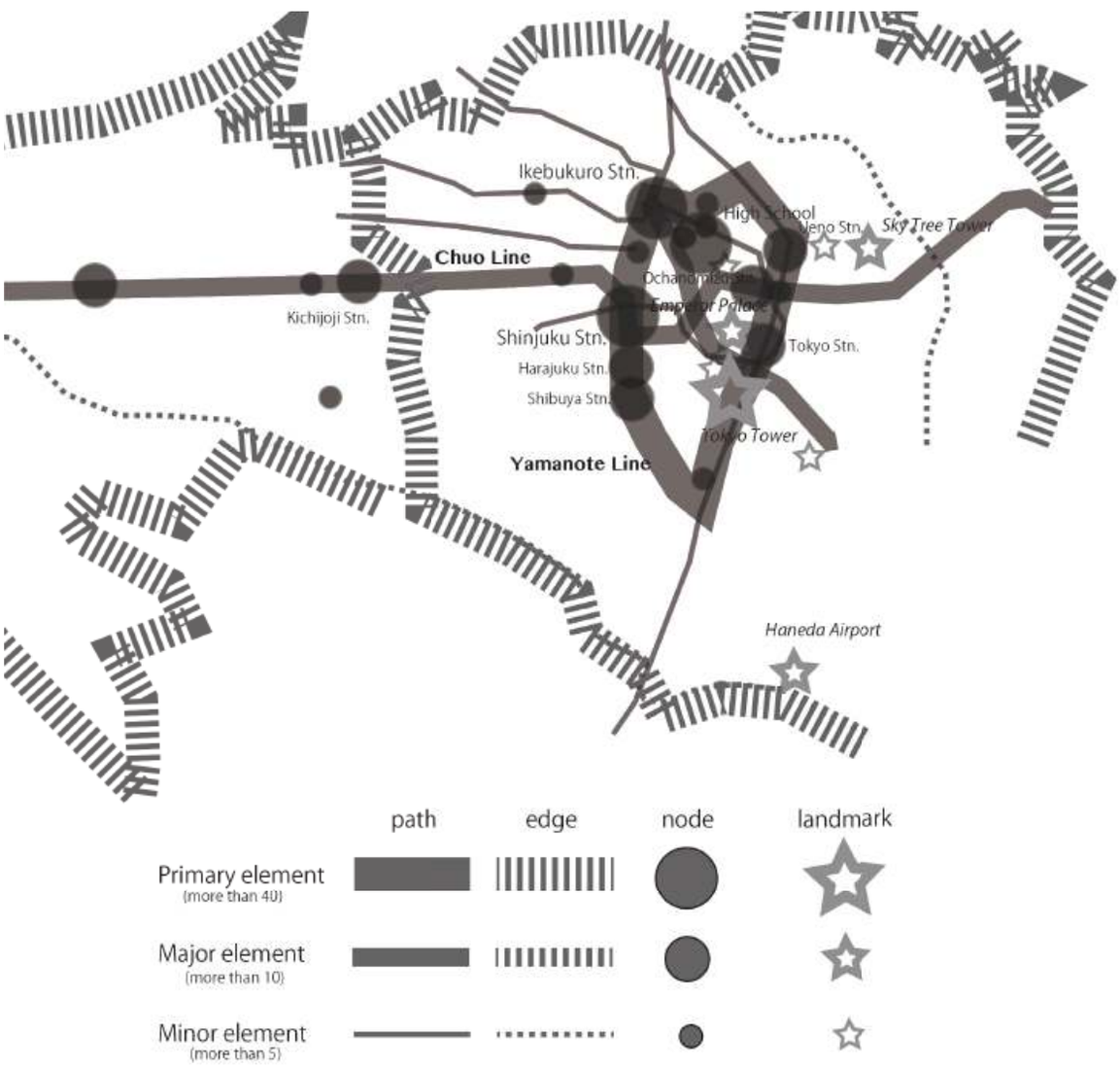

Figure 7. Diagrammatic representation of its major elements excluding district

Findings of the research are as follow.
A) Most of high-school students perceived spatial structure of Tokyo with train lines.
B) Most important train line for high school students to image Tokyo is Yama line that connects important nodes of Tokyo.
C) 142 students (74%) drew the municipal boundary of Tokyo Metropolitan Many maps had the correct shape of Tokyo Metropolitan Area.
D) Many maps did not have landmarks. Comparing to the number of maps tha stations, the number of maps that drew landmarks were much less. One can assum have not supported to comprise the spatial image of Tokyo for high-school stude

4. Conclusion

The study result suggests that high-school students have a strong tendency to spatial structure with train nodes and train paths. It has shown that Yamano framework to image the city. Some major stations also contributed in constr notably Ikebukuro, Shinjuku, Shibuya, and Tokyo. These are all terminal station On contrary, road network s role to construct the image of Tokyo is insigni students. In addition, the research found out that there is the lack of landma in Tokyo. Tokyo Tower was the sole landmark that had the lots of indications.

Therefore, in order to make Tokyo more legible, and with higher sense of p generations, it is recommended to improve accessibility to train stations and considered more seriously in enhancing its spatial structure. The landmarks sh and creating post-card city view should be considered. When there is an op some new buildings or parks that have a potential to become new landmarks, e colosseum, their design and vistas for them should be considered from urban des

Kevin Lynch conducted his innovative methodology of image study survey for r area. The application of his image study to the large city like Tokyo may hav for understanding the respondents real image of Tokyo.

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