INTRODUCTION

Recently, in the field of residential community planning, a workshop program is conducted to introduce town watching in order to identify good points and problems. Usually, such a program consists of town watching, map making and community planning discussion. Each workshop is usually conducted over several sessions, with each session lasting approximately 2-3 hours. However, because it is difficult for the same members to attend serial sessions, some programs only conduct town watching and map making. As a result, the original purpose of the program, i.e., organizing community planning discussions, is not fulfilled. To ensure the participation of a large number of people, it is necessary to develop programs that cater to beginners; a half-day (about 3 hours) program is ideal. Such a program must be developed by reducing the amount of time spent on town watching and map making, and by securing time to concentrate on community planning discussions so that the workshop is satisfactory even within a short time frame.

In previous studies, an exclusive geographic information system (GIS) (Elwood, 2002; Imai, 2007; Mitsuhashi, 2005), or WebGIS (Nagasaka and Maekawa, 2005; Rattray, 2006; Tsutsumi, 2007) was employed. However, few studies have examined the advantage or drawbacks for which GIS is used by paying attention to the working efficiency and the degree of understanding of the contents of the workshop participants. Specifically, an operator is needed because technical knowledge is required for map making by means of the GIS software. Therefore, the opportunity for the workshop participants to be involved in the map making decreases. Map making by using GIS may result in less communication between the participants than manual map making techniques.

Accordingly, this study clarifies the advantage of the newly developed workshop program using...
GIS. And it is intended to suggest associated problems and refinements of the program.

METHODS

A seminar entitled “collect cases of the city design in consideration of environmental issues, and make use of it for community planning” was established for first-year students at Tokushima University. A total of eight male students participated. None of the students had any prior knowledge of the survey area beforehand as they had all entered the university two months before the seminar and had not lived in the survey area. The students were divided into two groups: Groups A and B.

A total time of 3 hours was allocated for the workshop program in which tasks from town watching to a community planning discussion were carried out. The total area designated for the town watching was one square km; sufficiently small so that it could be covered in around one hour based on an adult walking speed of 4 km/h. The area encompassed the commercial centre of Tokushima City, south of Tokushima Station.

For town watching, Group A used a map and a digital camera, while Group B used a global positioning system (GPS) data logger as well to record photography points and the walking route.

Group A used manual techniques to make their map, and Group B utilized the GIS software. A 20 min break time was allocated for the GIS operator to prepare the map for Group B. An experienced graduate student acted as the GIS operator.

RESULTS

The comparison of the results of Group A and Group B, detailed in this section, revealed that the largest difference was the time spent on community planning discussions due to the different map making methods.

Town watching

The students were free to decide the walking route within the allocated area. Both groups walked along different routes. A total of 90 minutes was set aside for town watching, i.e., half the duration of the workshop. Both groups finished town watching within the scheduled time.

While walking, the students photographed examples of buildings and places with environmental or community planning issues in mind. They included pictures of a building with a green surfaced wall, a water park, a roadside tree, a green belt and barrier-free sidewalks. The students also photographed examples of locations with no consideration of environmental or community planning issues, such as sidewalks without planting, parks paved entirely with asphalt and concrete revetments.

The walk routes of the town watching of both groups were almost the same. Both groups photographed a similar range of buildings and places. In other words, there was no relationship between the data recording method and the photography locations or number of photographs.

Map making

Each group made an A1 size map noting the buildings and places discovered during town watching. Group B’s map was prepared by the GIS operator using the data recorded by the GPS device and digital photos taken by the group. The participants added the name of the group and each participant to the printed map. Information about the photography locations was added to the map by the participants. The map made by Group B is shown in Fig. 1 a - c.

The participants of Group B summarized collected photographs to three points for the city design in consideration of environmental issues: (I) relation of the river (Fig. 1 b), (II) open space and street (Fig. 1 c), and (III) compactness for walking. They chose a design relevant to Shinmachi River. And they chose the natural rich open spaces and streets in the central city area. Furthermore, they
regarded that the compactness of a city area was an important feature.

Group A’s map was printed on paper beforehand, and the walking route, photography locations, photographs and supplementary information were all added to the map by hand.

Because digital technology was used, the map produced by Group B was more complete than that produced by Group A. Specifically, the amount of supplementary information about the photography locations was greater. Group B wrote 41 notes related to 22 places, while Group A wrote 34 notes related to 20 places. In addition, the layout of the map produced by Group B was of a higher quality due to the use of the GIS.

It is thought that the amount of time spent on the monotonous work of pasting the photographs onto the map is related to the difference in the amount of information included. Group B’s map was completed in a shorter time than that of Group A.

Fig 1. a: An example of map: An A1 (594×841mm) sized map completed by group B.
b: A partial enlargement of the map, a typical example of design point “Relation of the river”.
c: A partial enlargement of the map, a typical example of a design point “Open space and street”.
Community planning

The use of a GIS shortened the map making time of Group B by fifteen minutes (45% less) in comparison with Group A. As a result, Group B was able to spend more time on community planning discussions. A breakdown of the workshop program time use is shown in Fig. 2. The longer discussion time allowed Group B to propose more suggestions than in the case of Group A that had approximately half the time. Furthermore, the opinions of all the group participants were reflected in the suggestions of Group B.

For design of a city like Tokushima that takes environmental issues into consideration, Group B suggested three factors: (I) relation of the river, (II) open space and street, and (III) compactness for walking. Group A suggested environmental considerations of a general nature that were not restricted to Tokushima unlike the issues considered by Group B. This appears to be due to the shorter time available to Group A for discussion.

![Fig. 2. Breakdown of the workshop program with allocated periods of time (minutes).](image)

DISCUSSION

Because Group B was able to spend more time on community planning discussions, the participants of Group B were able to summarize three factors for city design in consideration of environmental issues in comparison with Group A.

However, during the discussions, there were some differences in the way some locations were perceived by the participants of Group B, such as their individual memories of each location. Because photographs were included on the map using the GIS software, the participants in Group B took individual notes about each place. Consequently, work was needed to revise the information about four of the 22 photographs due to differences in the notes. On the other hand, Group A supplemented the placing of photographs on the map with conversation, and, thereby, decreased any chance of conflicting memories. In other words, the amount of communication time between the participants of each group was different. The aim of town watching in this program was to investigate the advantages and disadvantages of the town. Conflicting memories of the participants had no decisive effect in this case; however, it could be a substantial problem if concrete plans must be made from the results of the town watching.

In further work, we want to examine the workshop program with a view towards the advantages of GIS software for shortening the workshop time and the advantages of manual operation in sharing images between participants. A method in which participants can perform part of the work usually undertaken by an operator is desirable, even if this increases the time taken.

There were only eight participants for this investigation, which made it difficult to draw general conclusions. In the future, the collection of more examples will be needed to facilitate generalizations. In addition, an evaluation of the quality of the community planning should be performed by involving local residents in the workshop.
REFERENCES


