

## CONSTRUCTION OF GIS EDUCATION SYSTEM VIA DISTANCE LEARNING

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### ABSTRACT:

The objective of this study is to introduce GIS education system via distance learning system in Rissho University. The campuses of Rissho University are located in two places, and it takes 1.5hr by train between two campuses. Some of students take courses at both campuses. In order to get over such handicap, Rissho University has examined distance learning system. This system was complete in 2005 and will be used practically in 2006. This system can transmit/receive computer screen images, videos, images and sounds of classroom with low delay and high quality. In addition, it can record lectures, and students can review lectures. Faculty of Geo-Environmental Science in Kumagaya campus has a plan to teach GIS and remote sensing for students and for other faculties are interested in GIS. However, it is difficult to support the students in distant campus frequently. For this reason, we are enabled to use GIS via distance learning system. In computer rooms, one of three monitors on each table for students is used to display the images of teacher computer. If students cannot understand operations just referring middle monitor, teacher operates student computer from teacher computer. Thus, this system can teach how to operate GIS software for students in distant campus as they are the same class. We will use this system for teaching GIS classes in cooperation with other faculties, opening GIS classes of Faculty of Geo-Environmental Science to other faculties and making content of GIS lectures using recording function and so on.

### 1. INTRODUCTION

The campuses of Rissho University are located in two campuses, Osaki Campus in Shinagawa-ku, Tokyo, and Kumagaya Campus in Kumagaya City, Saitama, and it takes 1.5hr by train between two campuses (Figure 1).

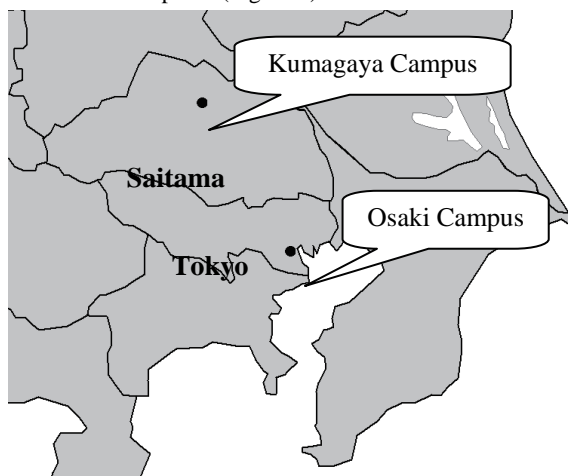


Figure 1. Location map of Rissho University

Osaki campus has Faculties of Psychology, Business Administration and Economics (all section), Faculty of Letters (freshmen, juniors and seniors) and Faculty of Buddhist Studies (juniors and seniors). Kumagaya campus has Faculties of Geo-Environmental Science, Social Welfare and Law (all section), Faculty of Letters (sophomores) and Faculty of Buddhist Studies (freshmen and sophomores). Some of students have to take courses at Osaki campus and Kumagaya campus both.

Furthermore, students desire to take classes and units of other faculties at distant campus for their career plan such as finding employment, acquiring qualifications and improving knowledge of languages (Yamashita, et al., 2006). However, it is difficult to take classes in distant campus for students.

The university establishment standards was revised, and we can give classes (lectures and experiments etc.) using multimedia at another place in addition to usual classroom.

Thus, Rissho University had examined distance learning system and this system was complete in 2005.

The objective of this study is to introduce the GIS education system via distance learning system in Rissho University.

### 2. OUTLINE OF DISTANCE LEARNING SYSTEM

We use distance learning system in six rooms (two classrooms and a computer room at each campus). Each campus is connected with high speed network (100Mbps). In this system, Digital Video system (DV over IP) and Video Conference system (H.323) are used. Digital Video system can transmit/receive images and sounds with low delay and high quality. In order to connect to distance learning system of other universities in the future, we adopted standardized Video Conference system.

Figure 2 shows overview of classroom. One classroom has two projector screens in front of the room and four plasma displays at the back of the room. These screens and displays can show students computer screen and other images.

Figure 3 shows overview of computer room. Computer room has a projector screen and a plasma display in front of the room. In addition, there are three monitors on each table for students. Left and right monitors are used for student computer. Middle monitor is used to display the images of teacher computer. The

images of teacher computer are also displayed in the middle monitor of distant computer room. Students take classes while referring operations by the teacher. If students cannot understand the operations just referring the middle monitor, teacher can operate student computer from teacher computer.



Figure 2. Overview of classroom



Figure 3. Overview of computer room

In classrooms and computer rooms, this system can record lectures synchronizing images of classroom and content such as Microsoft PowerPoint slide, and students can review the lectures anytime using internet browser.

### 3. GIS EDUCATION SYSTEM VIA DISTANCE LEARNING

#### 3.1 Introducing GIS Software

GIS software has been installed on all computers of computer rooms, and we have constructed GIS education system via distance learning. GIS software has been installed on twenty student computers and a teacher computer for each campus.

#### 3.2 GIS education plan

We are planning the following GIS education via distance learning system.

##### (1) GIS education for other faculties

Faculty of Geo-Environmental Science in Kumagaya campus has about forty GIS software licenses and about thirty remote sensing software licenses, and has taught GIS and remote sensing since opened the faculty. We have a plan to teach GIS and remote sensing for students and for other faculties that are interested in GIS, such as Faculty of Economics, Faculty of

Business Administration and sociological division etc. . However, it is difficult to support the students in distant campus frequently. We can get over such handicap by this system.

##### (2) GIS training for citizen groups such as NPO

In Japan, citizen groups such as NPO (Non-profit Organization) are beginning to use GIS, not just municipalities, companies and educational institutions. For example, an NPO is distributing the result of water quality survey using Web-GIS in collaboration with us. In order to popularize GIS to citizen groups and NPOs, we have a plan to give GIS trainings for them.

The members of citizen groups and NPOs with wide area activities such as river-related NPO may gather from wide area. This system enables them to take GIS trainings at the same time between two campuses.

##### (3) GIS training for public such as company

We will give GIS trainings about not only GIS software operations but also analysis examples (e.g. analysis of heat-island and bird habitat etc.) for public such as company considering introduction of GIS or studying how to use GIS.

Faculty of Geo-Environmental Science has given GIS trainings about ten times for public in Kumagaya campus. Because some participants came from distant place, we believe that GIS training using distance learning system is helpful for them.

When students cannot understand operations by teacher just referring middle monitor, teacher has to operate student computer directly on general computer classes. In this system, teacher can operate student computer from teacher computer remotely. Thus, this system can teach how to operate GIS software for students as if teacher and students are in same room.

##### (4) Making content of GIS lectures

Distance learning system can record lectures synchronizing images of classroom and content such as Microsoft PowerPoint slide. We have a plan to make GIS learning environment for students who do not take GIS courses by accumulating content of GIS lectures.

## 4. SUMMARY

This paper introduced distance learning system in Rissho University and GIS education plans using this system. This system can give GIS education for more students by one teacher at the same time between two campuses.

In the demonstrations of distance learning system for teachers, there are the following comments, "we are unsure about mastering this system" or "we need to prepare digital documents such as Microsoft PowerPoint slide for this system". In order to reduce their workloads, we need to develop support systems for them.

## 5. REFERENCE

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