An application of DVTS to interactive remote lectures connecting a high school with an university

Yuuichi Nakagami[1], Osamu Ohshima[2], Ko-ichiro SUGIYAMA[1], Kiyoshi Kuramoto[1], Masatsugu Odaka[1], Yoshihito Kawabata[3], Koichiro Sato[4], Kazumasa Kobayashi[5], Hirotatsu SASAGAWA[6], Mosir project

[1] Earth and Planetary Sci., Hokkaido Univ., [2] Kamogata Senior Hight School, [3] Kamogata High School, [4] Kamokou, [5] Soft, Kurashiki Univ. Sci & Arts, [6] Nextech Co., Ltd.

http://www.ep.sci.hokudai.ac.jp/~nakagami/

1.introduction

Recently, it has been reported that Japanese students in elementary and secondary education move away from science. According to the Third International Mathematics and Science Study (TIMSS, 1995) and TIMSS-R(1999), it is showed that the average score in science test of Japanese junior high school students is the highest level in the world, but their interest in science is the lowest.One of the methods to arouse student's interest in science is the lecture given by those who are in frontier of science research. However, Agata (2002) pointed out that the effect of the legiven by scientist is not continual but temporal, and a continuous support to school education by scientist plays important role. It is difficult for scientist to give a lecture frequently at elementary and secondary education schools because of distance between the schools and the institutes where scientist belongs. Therefore, in this study, we perform a interactive remote lecture by using video-audio broadcasting on Internet, which is expected to remove the distance, and discuss the effect of remote lecture on students and scientist.

2. Outline of the interactive remote lecture

We perform a interactive remote lecture on 23rd, 24th, 30th, 31st,October, 2002 between division of earth and planetary science, graduate school of science, Hokkaido university and Kamogata high school, Okayama Prefecture.Digital Video Trandport System (DVTS) which can send/receive Digital Video image and sound on Internet is used. We use Japan Gigabit Network (JGN) as a network connecting Hokkaido university with Kamogata high school because broad bandwidth is necessary to transport video data without lag, and Internet Protocol version 6 (IPv6) as a network layer protocol. The content of lecture is topics of earth and planetary sciences. Almost all of the management staff is university students who participate in voluntarily. We consider following points to peform the interactive remote lecture.

1) Constructing low cost and easy operation system

We construct a remote lecture operation system without special knowledge of computer science and information engineering, by trial and error.

2) Interactive communication on the lecture

To ensure interactive communication on the lecture, we try tokeep quality of sound introducing a echo canceling audio devices.

3) Cooperation between an university and a high school in producing educational materials.

We make educational materials originally which considers student's interests and the curriculum of the high school.

3.Results and disccusions

In the result of questionnaire after remote lecture, 80 % of the students answered "it's interesting !" and "it's easy to follow", and 90 % of the students is satisfied with this interactive remote lectures. It is because that we make educational materials cooperatively between an university and a high school, and keep quality of image and sound without lag. In consequence, the interactive remote lectures is an effective method of arousing student's interest in science in elementary and secondary education.

In this presentaion, we show the remote lecture operation system and educational materials. We also discuss remarkable points of a interesting remote lecture for students based on our resluts