

§19. Development of FECnet Utilization and its Application to Education

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PURPOSE

The computer network, FECnet that uses the Integrated Service Digital Network (ISDN) was introduced at National Institute for Fusion Science (NIFS) for real-time analysis of experimental plasma physics and nuclear fusion research. Physicists at universities can access the network in NIFS directly and join the experiments with real-time images, sounds and so on, irrespectively of the traffic in the Internet. In FY 1998, we successfully demonstrated the effectiveness of this system by applying the system to a distance teaching for a junior high school (JHS) from NIFS. The purpose of the research this year was to extend the demonstration from one-to-one (NIFS-to-JHS) to one-to-many (NIFS-to-JHSs) connections and to explore the new scheme of the NIFS open house to the public.

EXPERIMENTAL PROCEDURE

TV conference systems were prepared in several positions at the NIFS open house to the public, and in three distant junior high schools. A TV conference system consisted of a personal computer connected to the network in NIFS and a TV conference software (Enhanced CU-SeeMe). Three distant junior high schools accessed to NIFS via the ISDN (64kbps) lines. A TV conference server in NIFS was used for the multi-point connection. In the experiment, junior high school students in Toki and Tajimi cities cooperated as reporters. The communication was arranged in both ways so that the distant students could give

questions and so on.

RESULT

The figure shows the sketch of the distance teaching. A researcher explained his work to a junior high school reporter. The resultant communication was different for three schools; in good quality, with some problems in video image, and unable to connect. The reason was unclear but can be the limitation of the capability of the server or any inappropriate settings in the TV conference software.

We found the setup of the TV conference system in the junior high schools were difficult and laborious than expected. This is because the network in the junior high schools were different one by one. The adoption of DHCP and Firewall made the setting difficult. The network in the junior high schools was used in lectures everyday, which limited the preparation of the experiment.

The experience in the demonstration this year seems to indicate the limitation of the present FECnet; considerable preparation is required for multi-point TV conference on the Internet under the present network infrastructure and security policy.

Recently, school-to-school communications are introduced in many schools. They use a Phoenix system, which is a TV phone using ISDN line, rather than TV conference system on the Internet. The TV phone offer a better communication quality with simpler operation. The TV phone may be effective also in the original use of FECnet. For example, the real-time exchange of the opinions with distant researches are on the TV phone while the transfer of the experimental data on the Internet. Such a new FECnet system should be discussed and developed.

