

On E-Educator Training for “Information Design”-Oriented E-Education

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Abstract

“Advance in e-education infrastructure” makes sense when advance in the e-education superstructure, which is the e-educator, meets it.

“E-education” I subject here is the one which comes from the standpoint of “information design”. It becomes : (1) web-based and asynchronous, (2) intended for nurturing/raising/training faculty, rather than providing knowledge, (3) intended for complement of onsite education, rather than substitute for attending school, and (4) introduced as solution for problem-solving-type education, or self-teaching system.

The e-education of this sense scarcely goes with division of labor. The e-educator is to enter, more or less, all levels of e-education - from academic specialty to IT-literacy.

This type of ability integration is formed through “information design”-oriented practice. In particular, the faculty development on e-education is mostly characterized as faculty development on information design.

Introduction

Thus far, "e-education" actually has been remote education or residential education. It is as follows :

- Remote education kits/packages are developed from the standpoint : “*Teacher-as-users are novice at IT.*”
- The system is of two types :
 - a. One which yields a remote education by means of live video
 - b. One which yields a web-based virtual school
- In the case of the web-based virtual school, the standpoint held is :
 1. Any instructor can participate with little trouble.
 2. Teaching material (web contents) is made alike, regarding style and quality.

And it becomes a way that instructors submit (upload to the server) their teaching material in accordance with given formats. It follows that teaching contents is mostly text. That is, to make teaching contents is just to write text.

Beside this, we can subject another type of interest in *web as teaching/learning media*. It is the one from the standpoint of "information design". Here the idea of "information design over multimedia" leads to the idea of "web-page as platform of rich contents".

I, myself, have been practicing design of multimedia teaching material (since the end of 1980s) and web-based instruction (since 1995), from the standpoint of *improving mathematics education by raising the quality of teaching/learning material*. ([1], [2], [3], [4], [5], [6], [7])

While the meaning of e-education from the standpoint of

remote education is the broad distribution of education by which cutback in cost/labor is expected, the one from the standpoint of "information design" is the improvement of education in the sense of *improvement of content*. While the former concerns quantity, the latter concerns quality.

For the "information design" side, "e-education" has been an impractical subject until recently. That is, e-education has just started now.

Indeed, the "information design"-oriented e-education has been out of personal capacity in respect to cost, environment, technological requisite and so on. I, as one of those who have been studying and practicing it, met various kinds of difficulties in organizing courses and student's activities.

Recently, the hard- and softwares which are proverbial for digital contents making have become to meet personal use in respect to the price. As to storage media, the large capacity together with the lowprice has been realized. And, most importantly, the number of citizens have entered such communication circumstances as afford e-education (multimedia PC, broadband network, etc.).

The approach to e-education by “information design” becomes quite different from the one by “broad distribution”. As to broad distribution, it is expected that a well-designed online system *makes it possible for traditional teachers to enter the e-education*. And therefore, mass production of e-educators becomes the policy of system design. On the other hand, in the case of information design, the policy is : *to support educators to bring her/his originality into full play*. It is irreconcilable with mass production of e-educators.

After all, in the practice of "information design"-oriented e-education, educators are obliged to be independent. Importation of division of labor will just result in complications. Educators are to design a system, to make contents, and so on, independently, to greater or lesser degrees. Thus, "versatility" is a condition for being an e-educator.

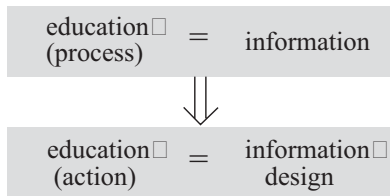
"Versatility", however, is just a temporal expression which is meaningful as far as the present/traditional educators are concerned. In the near future, it becomes a common trait of educators. Indeed, in competitive circumstances about career making, s/he will become obliged to be "versatile". And programs for e-educator training will be imported in various types of school, to say nothing of traditional teacher training schools.

Conceiving this perspective, I will consider, from the standpoint of information design, the e-education and the ability to e-educate, and will propose a method of e-educator training course, referring to my practice in a teacher training course.

1. E-Education

1.1 Education as "Information Design"

Education is a process of information. Indeed, that the aim of the education is attained means that the information aimed at is completed. Therefore, constructing and performing education is regarded as act of information design.



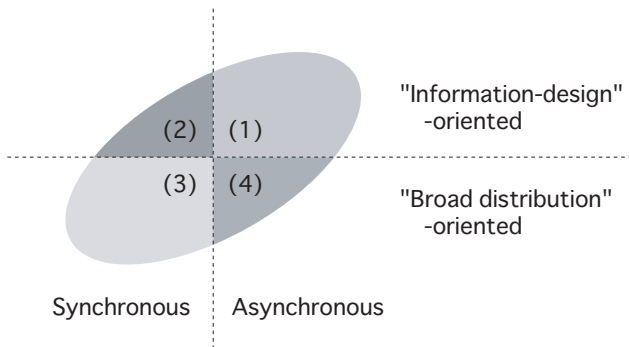
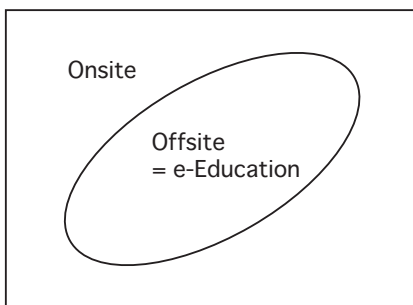
1.2 "E-Education"

Let us divide Education-IT relations into the following two classes :

- a. Education aided by IT
- b. Education of IT, or IT-Literacy

Furthermore, let us introduce a classification of "b. Education aided by IT" :

IT-aided Education



E-Education(1) actually becomes web-based, where "information design" consists of :

- Server construction (system design)
- Website construction (course design)
- Contents making (instruction design)
- Management of course/students (management design)

1.3 "Information design"-oriented, asynchronous, web-based e-education

For briefing, let us use the expression of "e-education" in

the sense of "information-oriented, web-based and asynchronous education".

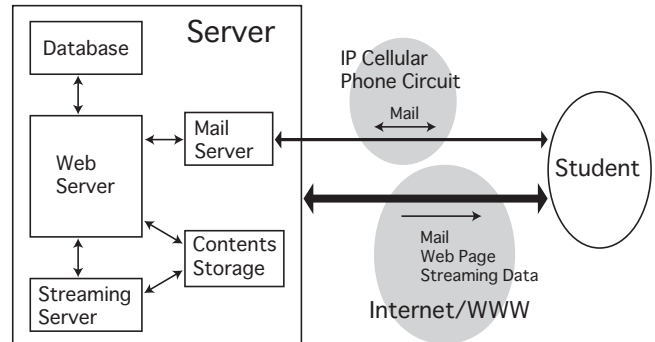
In detail :

1. Web-based, asynchronous

[We are not concerned to consider synchronous remote education, such as TV meeting/conferencing device is used.]

Instructor serves students contents for self-teaching/training in the form of homepage. Students access the homepage and self-teach/train by it.

E-mail and "chat/notice" web-page are available as means of communication between instructor and students.



2. Nurturing/raising/training system

In general, an e-education is located somewhere between the following two opposite poles :

- A. Knowledge storehouse
Motivated visitors look for what may suit their concerns.
- B. Nurturing/raising/training system
Responsible to raise students (users) to the goal. Yielding dropouts means that the system is defective. Therefore, in particular,
 - It starts with motivating students to study.
 - Evaluation of students' results is indispensable.

We are to consider "B: Nurturing/raising/training system".

3. Enriched education

We consider "e-education" as a solution for enhancing the quality of a given education. The reason of this idea/expectation is *power of digital*. [E-education as a solution for broad distribution of a given education, or e-learning as substitute for attending school, is not what we are concerned here.]

For example, our e-education is introduced :

- As extension of onsite instruction, where students can self-teach to the full understanding without being pressed for time.
- As a method of "problem-solving"-type instruction, where tasks are assigned to students, and students endeavor to make their own solutions, with taking time satisfactorily, and referring to information/hint provided online by the instructor.

Remark: E-education is not in opposition to school education. It can be a component of school education.

4. Result of an optimization from the viewpoint of "instructor's capacity" (trade-off between students' satisfaction/educational effectiveness and instructors' capacity)

That a convenience for students, educational effectiveness,

or an obligation of instructor is lacking means that it is intentionally cut off by the reason of *economy*.

5. Best use of e-education

"E-education" we subject here is such is employed in combination with school education, from the standpoint of "best use of e-education". Each of school education and e-education has its own strong points and weak points.

For example, in most cases, it is difficult for inexperienced person to master physical skill (such as swimming) web-basedly. But, for experienced one, there is definitely a place where web-based instruction becomes effective. What is learnable by web-based instruction depends on learner's readiness.

Generally speaking, self-teaching by web instruction material works well for those who know the issue and want it to be developed thoroughly, minutely, or in an easy style.

Remark: Whether a web-based self-teaching works for initiating a learner into an inexperienced subject depends on the subject, too.

2. Faculty to E-Educate

2.1 Constituents of e-education

The following matrix shows, very roughly, prime constituents of "e-education" :

		Realization	Management	Development	
School /Course	Characterization	Concept Aim/goal	x	x	x
	Online system	Web server Database Network	x	x	x
	Discipline	Organization Student's experience Web contents	x	x	x

Here, "Online System" enters, more or less, the domain of "teaching". Indeed, the practice of an e-education course is of such phases as :

	Target		
	Server System	Contents	Students
Planning /Organization	Design /Construction of System	Preparation of Contents	Specification of Targeted Students
Practice /Management	Use /Management /Administration of System	Management /Administration of Contents	Instruction /Management
Evaluation	Evaluation of System	Evaluation of Contents	Evaluation of Students' Results

2.2 Totality - Inseparability of required faculties

The entity of e-education, as seen above, is difficult to be implemented by division of labor, because :

1. Each production-procedure is of small size, and continuously connected to the pre- and post-process.
2. The course, or the teaching contents, which an instructor plans and makes is very personal. It is not easy for the instructor to tell other persons what s/he aims at, intends and considers.
3. It becomes a usual state that the instructor constantly makes, enriches and refreshes (changes, modifies) her/his teaching contents, or system, as responses to the outcome/result of each piece of instruction.
4. After all, in the case of e-education, the division of labor (in particular, out-sourcing) does not pay from the point of efficiency/economy.

Hence, if an instructor is going to perform an e-education, s/he becomes obliged to cover, more or less, all dimensions of the education. (Extremely, those such as information engineering, project management are included.) At least, the e-educator is to perform both instructor and operator (web-contents operator). S/he cannot be instructor without being operator.

Thus, we can say that "versatility" is a characteristic of "e-educator". Constituents of "versatility" are such as:

- Academic specialty
- Education -- Method of education, Know-student
- IT-Literacy -- Computer, Information communication network, Internet, WWW, Internet application, Homepage making, Server, Database, System maintenance
- Design -- Information design, Attraction design, User interface
- Management skill -- Course, Student, Project
- Business strategy

2.3 Ability to e-educate as basic skill of educator

Is the ability to e-educate a special ability of educator? The answer depends on the situation.

If it seems to us a special ability, it is because e-education is very new and we are in a period of transition. It is probable that the ability to e-educate will become considered as a basic skill of educator, because :

- Ability to e-educate will become a prominent competitive factor of educator-career-making and, accordingly, there will appear various kinds of e-educator training course.
- In particular, at teacher training schools, a kind of e-educator training course will be embodied in traditional courses.

2.4 Developing Own Ability to E-Educate

What is demanded as ability to e-educate is much, as seen in the previous consideration. It is improbable that an e-education package/kit enables general instructors perform as e-educators. Indeed, teaching materials which are produced from coupling of an e-education package/kit and teaching staff who are allowed to be negligent about e-education would be just a bundle of reading matter, which does not bring forth an education we are concerned here.

Thus, without entering the content of e-education deeply for

some degree, s/he cannot take the role of e-educator. To be an e-educator implies to keep raising and developing their own ability to e-educate.

Most of e-educators may practice their FD in styles of on-the-job-self-training. Systems for this FD do not have yet grown up enough, because it is not long since the idea of "e-education" (that is, "web-based education") actually appeared. The progress of e-education infrastructure is steady and remarkable. Thus, the success of e-education depends mostly on personnel training (FD) and, from the view point of policy, on the human resource management.

3. Capacity-Problems E-Educator Bears

3.1 Capacity-Problem

Being an e-educator is very tough, even if we are fortunately given a position where we can devote our energies solely to the e-education. There are many things to do : to learn/master, to check, to prepare and to manage.

Money aside, personal time and physical strength are the definitive constraints on e-educator's performance, because they are physically limited. Indeed, being truly an e-educator would exceed the capacity of a single person.

3.2 Division of Labor

Division of e-education organization may be :

- producer, director, design manager
- system engineer, web-designer, instructor
- assistant system

Here the subjects accompanying division of labor are such as :

- Guideline/framework of implementation
- Motivation toward the work
- Creativeness
- Ability to achieve
- FD system

If a division is made to correspond directly to the contents of production, it would be like :

			Realization Management Development
School /Course	Character-ization	Concept Aim/goal	A
	Online System	Web Server	B
		Database	C
		Network	D
	Discipline	Organization	E
		Student's experience	F
		Web contents	G

However, cutting off web-contents making from the works of the instructor is implausible, by the following reason :

- Contents updating (add/modify/delete) is of frequent occurrence. Every time an instructor prepares a class or evaluates students' results, s/he will meet many parts which s/he wants

to update. It is unrealistic, in the sense of uneconomic, to ask other to update them, explaining every way of updating.

- A variety of ideas on instruction (web-design) is suppressed when the web-contents-making is of order-made. Originally, every instruction is of strong individuality. This should not be suppressed, but highly recommended.
- The web-contents making is what the instructor can learn and master.

Even the design of server system/database should belong to each instructor, if possible, because it is one of those which progresses by responding to each dissatisfaction of instructor and to each student feedback.

3.3 Trade-off between educational effectiveness and capacity of instructor

E-educators are obliged to make trade-off between educational effectiveness and their capacity, in such manners as :

- Reducing the number of classes in charge where e-education is introduced.
- Going slow about preparing/enriching/refreshing contents.
- Using a standardized e-education package software provided by a third party.
- Giving up the operation of the server.

3.4 Evaluation as prime capacity-eater

In the phase of evaluation, the instructor is to face each student. Thus, if an e-education is an actual/practical one, the instructor will either

- A. omit evaluation, or
- B. face each student and evaluate her/his results.

This is a problem of educator's capacity. And the educator's capacity particularly determines the size of e-class. In this sense, evaluation becomes a constraint on capacity of e-education. If an e-education includes evaluation, it is going to determine the quota of students.

Thus, it is the evaluation that clearly discriminates "web-based education" from "providing educational web pages".

4. E-Educator Training Course

4.1 Reason of the course

The content of development of faculty to e-educate is sizable. Thus, the subject of "systematic training of e-educator", or "e-educator training course", holds.

The aim of the course is to raise the ability to e-educate. And the goal for student is a self-confidence in performing e-education, as a self-realization.

An immediate idea is : *To make traditional teacher training courses include e-educator training courses.* Indeed, future teachers will not be allowed to be negligent of e-education.

4.2 Subjects in the course

We can apply our framework for considering "e-education" to the subjects to be taught in the course :

"School /Course"	"Characterization"	"Concept" "Aim/goal"	Fundamental principles and procedures, Differentiation, Intention
	"Online system"	"Web server" "Database" "Network"	Mechanism, Function, Application
	"Discipline"	"Organization"	Ideas for curriculum and course design
		"Student's experience"	Classroom communication, Knowledge, Understanding, Skill, Ability, Progress, Development, Research methodology
		"Web contents"	Lecture Design, Structured presentation, Effective procedures, To communicate theories/ideas/facts, Lecturing skills/techniques, Teaching tool, Contents making tool

4.3 Method of the course

Prime constituents of the method for making/managing the course are :

- A scholarly (or specialized-subject-based) course, such as "mathematics education", is the main. And there, e-education-related subjects are introduced in connection with information design.
- Each application of e-education-related subjects must be "narrow and deep", not "wide and shallow". Indeed, raising a generalist is not what this training course aims at. (*Remark: "Graduate school" is not a solution. Relying on an upper school is just to put off making present courses practical.*)
- Of integrated structure
- Accumulation of experiences of e-education performance
- Disciplines of problem-solving
- Appreciation of works
- Information design
- Web-site construction/design
- Media literacy -- To improve participant's communication skills through different communication media (especially, teaching tools).

Education programs which are designed from department-oriented or course-structure-oriented standpoint would not work. It tends to go exhaustive and, therefore, the education becomes shallow and diffuse. It is not a way to make students gain real power.

In the sense that ability to e-educate is an integration of various types/levels of information design, e-educator training is a discipline of information design. And an appropriate way of discipline of information design is to make a regular instruction (instruction on traditional academic specialized field) embody task working, or problem solving. Indeed, if the subject of the task is not authentic and materials are such as collected at opportunity, students set themselves to work just for the sake of task. This is not a discipline of real power.

On the other hand, to make a regular instruction embody discipline of information design leads to an improvement of the instruction itself. It is genuinely an improvement in the sense of enrichment, not a change of the course to a different one.

After all, what instructors do in e-educator training course is not to teach about e-education, but to make students experience/do e-education.

5. My Practice of "E-Educator Training"

5.1 Situation

It has taken long time for me to reach the present stage of practice of :

1. "Information design"-oriented e-education.
2. Raising student's ability to apply digital power to teaching material making, in the sense of information design.
3. Raising student's ability to e-educate.

The following idea came to me around the end of 1980s when I got to have the Macromedia Director ("Macromind Director" is the name at that time) :

"To enable genuine-math teaching by introducing learner-friendly - though mathematically genuine - expressions, which information design activity strengthened by new-media power can yields."

But, for more than ten years, I was obliged to cope with various kinds of shortage/bottleneck. And recently, at last, the condition has been fulfilled.

Indeed, what I have obtained now is fantastically much more than I once expected. In these over ten years, the Internet and WWW came, and information communication tools/facilities (computer, tools for multimedia contents making, equipment for digital presentation, storage media, etc.) keep remarkably progressing and becoming affordable in the price. And my practice of "information design/e-educator training"-oriented mathematics education course has recently begun having a fixed form. I think it is time to report my practice.

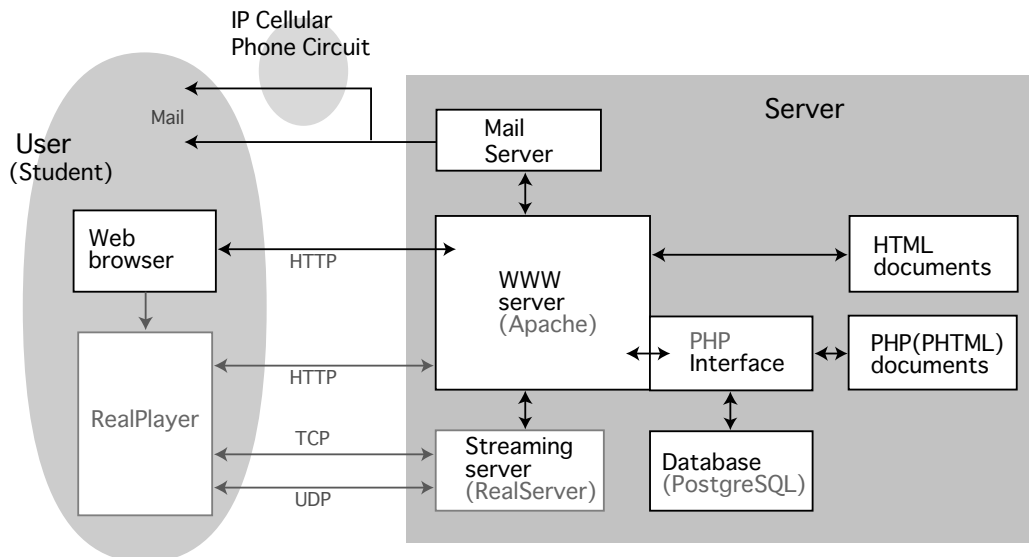
5.2 Progress

Here I will briefly show the progress in which I have reached the present state of practice, that is "information design/e-educator training"-oriented mathematics education course.

1. Conceptualizing "e-educator training", confirming this idea

I have been confident that it is necessary to introduce the viewpoint of "e-educator training" into the teacher training course. The following is my rough inference:

1. Course/instruction design is information design. Hence, teacher is information designer.
2. Information design is practically information design over multimedia (digital media).
3. Education which is designed over digital media ought to extend to "e-education" in our sense ("information-oriented, web-based and asynchronous education").
4. Hence, education at teacher training course ought to include e-educator training.



E-education server I am managing

2. Course design

In fact, I grew the idea of "e-educator training" in my practice of "information design"-oriented education. It is not the case that the practice came after the idea.

As to the course design, it is required to apply different types of instruction because the classes are of different condition to each other. My method is as follows :

A. In the case of a class where the attendants are many, and only "lecture" is allowed as the form of instruction, the instruction is made in style of homepage-based digital presentation. *Demonstration of 'information design'* is one of the important effects I estimate here. And I explicitly make information design a subject as well, by taking the position to consider :

$$\begin{matrix} \textit{instruction-design} \\ \textit{/teaching-material-making} \end{matrix} = \textit{information design}$$

Besides, a homepage-based self-learning system is served. This is necessary because instruction tends to become quick in the case digital presentation is its form.

B. In the case of a class where the attendants are not so many and, therefore, the homepage-based training is possible, the class is designed to proceed with tasks assigned to students. Students make reports in the form of homepage, and their results are evaluated from the viewpoints:

"Do they reach an subject(content)-understanding aimed at in this stage?" *"Do they reach an information-design-ability aimed at in this stage?"*

The homepage-based self-teaching system mentioned above works especially in the following manner :

- Report making is a work on computer. Operations required there are carefully instructed.
- While making the report, students can refer to the system about the subject (meaning, application, etc.).

C. In the case of the seminar, where "self-development" is set to be student's general objective, students are assigned to develop teaching material for WBT (web-based training), to undertake interactive remote education (make program and perform), etc., while developing the skills for planning, con-

tents making, group working, goal reaching, and so on, through practice.

3. Web-based education system

Because I have been managing a web server for my practice of e-education since 1995, I did not need to do something special to introduce "e-educator training". ([7])

5.3 Web-based Management

My system realizes a communication, teaching/learning, shown in the figure above.

Primary instances (tables) of which the database consists are : *Instructor, student, class, class-instructor, class-student, chat, notice.*

The web-pages for student's self-teaching have a menu consisting of : lecture room, chat, notice, students' achievement results, guide for report making, and so on :



5.4 Courses

In the following, I will introduce my practice of giving classes.

First, let me list my classes by tables. The first one is arranged according to the type of learning activity, and the second, the grade. (Taking charge of *Information Design*, *Course Development*, *Computer Operation* and *Integrated Research Activity* is irregular.)

Type	Class Name	Credit
"Audit"	Elementary School Math	4
	Information Design	2
	Course Development	2
"Practice"	Computer Operation	2
"Report Making"	Lower Secondary School Math	4
	Upper Secondary School Math	2
	Math Information Design	2
"Project"	Integrated Research Activity	4
	Seminar on Math Education	4

Grade	1		Integrated Research Activity
	Spring	Computer Operation	
2	Fall		Elementary School Math
	Spring	Lower Secondary School Math	
3	Fall		Seminar on Math Education
	Spring	Math Information Design	
4	Fall		Seminar on Math Education
	Spring	Upper Secondary School Math	

5.4.1 "Elementary School Mathematics"

The instruction is made in the form of homepage-based digital presentation. Contents are : (1) Essence, way of understanding, of subjects; (2) Instruction design, instruction method; (3) Mathematical subjects of which the elementary school mathematics consists.

Contents displayed on the screen are webpages, which are "presentation" version of the "self-teaching" pages, and stored in the server.

Students can minutely and repeatedly study, in the "self-teaching" homepage, more of the contents presented in the lecture room

5.4.2 "Lower Secondary School Mathematics"

In this course, students advance their learning by making reports in the form of homepage (five reports per semester). Each report is a scenario/script of instruction, following which a mathematical subject is taught. The learning is of practical

and problem-solving type. There are cases where group-workings are assigned to students.

Each student is given a theme, which is a mathematical subject in the lower secondary school mathematics. They must, firstly, understand its essence/meaning. They do this by using the "self-teaching" system. They can learn homepage-making too, in the same way. Next, they are to make instruction scenario for teaching the subject.

Literacy which students should raise is about HTML, FTP, and painting/drawing softwares.

The learning is expected to bring the followings :

- Understanding the stance : "*To view the school mathematics from a higher standpoint of mathematics*"
- Progress of class-design ability
- Progress of digital-contents-making skill : Computer/network literacy, Operation of application software.
- Discipline of general ability : Acting subjectively and independently, Adapting to works of problem-solving type, Making habit of completing works by the deadline, Making habit of getting results, etc.
- As to group-working, (1) Knowhow about group-working, (2) Deepening awareness of mutual responsibility and joint responsibility, etc.

5.4.3 "Mathematics Information Design"

The style of leaning in this course is almost same as that of *Lower Secondary School Mathematics*. The difference is : Students are to make, in stead of teaching scenario, mathematics self-teaching homepages targeted to lower secondary school students.

Students have already passed *Lower Secondary School Mathematics* and there gotten the hang of studying mathematical subjects and representing their understanding to homepages.

Literacy which students should raise is about HTML, FTP, and Flash (Macromedia). General discipline this course brings to students is the same as *Lower Secondary School Mathematics* do, which is described before. Indeed, this course, as a general discipline, is meant to be an development of *Lower Secondary School Mathematics*.

5.4.4 "Upper Secondary School Mathematics"

In this course, students are to make inquiry into subjects of "linear algebra" in the upper school mathematics. Other subjects are intentionally left out. Here I give deepness the priority over broadness.

The goal is that students reach understanding : "*Subjects of linear algebra are simple extensions of those of 'number and quantity' in the elementary school mathematics.*"

Mathematica is used as a tool for making precise visual expressions. Students must master the basics of *Mathematica* during the first one month. In order that their learning is efficient and completed in the period, students are recommended to have a book where the application of *Mathematica* to the study in linear algebra and calculus is the theme.

After mastering the basics of *Mathematica*, students enter the stage of : (1) making inquiry into subjects of linear algebra, (2) making website where upper secondary school students can

self-teach linear algebra.

General discipline this course brings to students is the same as *Lower Secondary School Mathematics* and *Mathematics Information Design* do. Indeed, this course, as a general discipline, is meant to be an development of them.

This course, however, is of high hurdles for students. Indeed, in the case of traditional teacher training college, it is difficult to make students reach a mathematical specialty sufficient for teaching mathematics in the upper secondary schools. There is also a social problem of "decline of students' ability in mathematics". (In 2002 school year, only one student can reach the credit.)

5.4.5 "Seminar on Mathematics Education"

In this seminar, it is ruled that students are responsible for developing their own ability. Ability for planning, computer/media-literacy (web-design, etc.) and presentation (digital, in English) are regarded basic.

The ability/skill to be developed is about:

- Mathematics education -- Objectives of mathematics education, For each mathematical subject, its meaning, Instruction/learning media, Instruction/learning method, Instruction design.
- Project achievement -- Joint responsibility for achievement, Making plan/proposal, Practice, Presentation, Goal-reaching.
- Design of web-based education of mathematics
- Homepage making, web design -- HTML, FTP, Flash.
- Digital contents making -- 3D CG, Digital video editing, Streaming video.
- Interactive remote education
- Digital Presentation
- English ability

The above-mentioned abilities/skills are trained by the two types of practice: (1) Self-discipline of basic skills, (2) Group-working of project-achievement type.

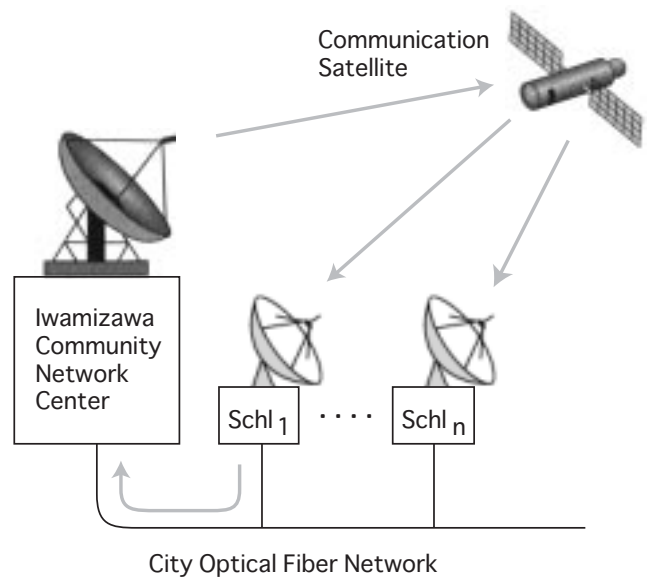
The tasks/assignments for self-discipline are:

- Making the experience in university mathematics be a sound selling point
- Raising skills for digital contents making
- Expressing own ability in the form of personal website for e-education
- Making a digital presentation in every meeting of the seminar

And the tasks/assignments for group-working are:

- Making and achieving a program of "CS Distance Learning" presided by Iwamizawa City -- the city where my campus is located
- Making an exhibition at the campus festival
- Presentation in English to visitors from other countries
- Presentation at a cross-universities meeting on digital contents making

While producing a group-working, I take care, with an eye to the work style which full-fledged members of society is imposed, (1) to restrict the period of working and (2) to let students be responsible for reaching the goal. Indeed, the tasks/assignments mentioned above is such that : (1) Deadline exists;



CS distance learning system of Iwamizawa City

(2) It is required to achieve carefully because other people are targeted. And students work with tension, feeling that their retreat is cut off.

It must, however, be added that I have reached this style of instruction in this school year (2002 school year). What has been solved in the meantime is the requirement for tools (hardware and software) and facilities. Formerly, I managed "information design"-oriented education in coping with various kinds of "lack" (expense, performance of soft/hardware, number of soft/hardware, infrastructure and so on).



A scene of the seminar (Presentation to visitors from other countries)

5.4.6 "Integrated Research Activity"

In 2001 school year, I had charge of this class and, from the standpoint of developing integrated ability, designed it as a course for discipline of the ability to make project and to design information.

In the first half (spring semester), the students produced and performed programs of *FM Hamanasu Japan*, a local FM station in the city of Iwamizawa. (The students were divided into two groups, and each group made a program.)

In the latter half (fall semester), the students produced and performed a program of "CS Distance Learning" presided by Iwamizawa City.

In each job, the students were put in a position responsible for the results. Thus, the course may be characterized as "real social practice".



A scene of CS distance education

Conclusion

In this monograph, I firstly subjected a standpoint from which the e-education is regarded as an improvement of the quality of traditional education in the sense of "information design"-oriented, web-based, and asynchronous education. And then I specified the constituents of e-education to give a framework for considering e-education.

Next, the faculty required for being e-educator is considered. It is an integration of various types of ability, from academic specialty to IT-literacy. It releases practice of information design and, conversely, it is raised through "information design"-oriented practices. Indeed, e-educator is to manage various types of tasks (design of server system, contents making, instruction, etc.). Division of labor does not work well in this case. It will just result in complications.

Raising own ability to e-educate is a tough subject for traditional educators. But, in the near future, this ability will be a requisite for an average educator. One cannot be neglectful of it in the career-up race. Thus, I considered, as the third subject, development of faculty to e-educate and, especially, e-educator training course.

Education programs, which are designed from department-oriented or course-structure-oriented standpoint would not work. It tends to go exhaustive. It is not a way to make students gain real power.

In the sense that the ability to e-educate is an integration of various types/levels of information design, e-educator training is a discipline of information design. An appropriate way of

discipline of information design is to make a regular instruction (instruction on traditional academic specialized field) embody task working, or problem solving. And to make a regular instruction embody a discipline of information design leads to an improvement of the instruction itself.

After all, what instructors do in e-educator training course is not to teach about e-education, but to make students do e-education.

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