

## A Smooth Road from Conventional Teaching to Distance Learning in Teacher Education

HARUO NISHINOSONO

### Introduction

As a result of rapid developments in information and communication technology (ICT), dramatic changes are taking place in approaches to teaching and learning in university and school classrooms. These changes offer new opportunities to explore entirely new methods of instruction in teacher education. ICT provides alternatives to conventional audiovisual media (films, videos and TV programs) and opens up an entirely new framework for knowledge distribution among teaching professionals. However, introducing new information technologies into schools will not automatically confer benefits on teachers and students. In spite of the promise made available by technology, many teachers remain conservative, preferring to hold fast to their familiar teaching practices, and reluctant to explore the possibilities that technology creates for transforming teaching and learning. Of course, the introduction of ICT into schools does not automatically produce benefits to students. It often amounts simply to the installation of equipment that is seldom used. The reasons for this reluctance to change can be traced to the individualistic and isolated nature of the teaching profession and the low communication rate among colleagues in the workplace.

In this paper, I describe, in two parts, an innovative approach to distance learning for teacher education conducted with second year students in the B.Ed. program at Bukkyo University in Kyoto, Japan. The first part concerns the development of symbols and a pictorial presentation system for a universal communication required for distance learning. The second, concerns the application of the system to convert instruction from a traditional teaching style to a new one applicable to distance learning, and to examine its feasibility.

### The case for a common professional system of symbols and models

Television, telephone and Internet make it possible to communicate across the globe—anywhere, anytime.

Yet in spite of the convenience of modern communication technology, such innovation has brought about no productive exchange of teaching experiences among teachers, especially among those working in different languages. In effect, the language barrier prohibits professional exchanges among teachers. And yet, other professionals such as architects, electricians, and mechanics use symbols and figures to express their ideas and to communicate with each other, even though they may speak different languages. They have developed a common professional terminology and system of symbols and other conventions that allow them to conduct important business such as prescribing treatments, designing products and describing experiences. The teaching profession, however, has no universally agreed on system of symbols or models for prescribing lesson plans, describing teaching and learning events in classrooms, and assessing teaching outcomes. I wish to make the case that the success of distance learning, especially if it involves international collaboration, requires a means of common communication that is sufficiently rich to express important professional ideas and share common experiences across various workplaces and on the Internet.

### Description of educational problems

Educational researchers conduct scientific observations, engage in qualitative and quantitative analyses, and share their experiences through academic journals or other publications. More recently, these professional communications have been increasingly conducted through ICT. But no matter how convenient these methods are for researchers, teachers have very limited opportunities to share teaching experiences in a systematic way through technological media. Educational problems are increasingly growing more diverse and complex. Teachers are also made aware of them, immediately, and on a global scale—through communication satellites and the Internet. They can communicate orally with their colleagues or other teachers only in school meetings or in the workplace,

but the language barrier inhibits a broader sharing of professional experiences. Traditional literature in education successfully describes philosophical thought and educational values, but fails to communicate practical knowledge in any reliable form. Teachers are unused to expressing ideas and experiences through public media to enhance their professional competence. There is no universally regulated or unified method to describe teaching and learning events and the teacher’s judgment in his/her classroom.

Educational measurement tools can reliably assess the outcome of instruction, but no means exist to communicate the richness of the instructional process. Video recordings do show the teaching process, but without any interpretation. Observations of real teaching situations are useful, but remain ineffective in showing the teacher’s intentions or ideas. The spectrum from visible record to linguistic description can be shown as follows:

Real  $\leftrightarrow$  Audiovisual  $\leftrightarrow$  Expressive  $\leftrightarrow$  Linguistic  
 In classrooms In videos By signs and symbols In literature

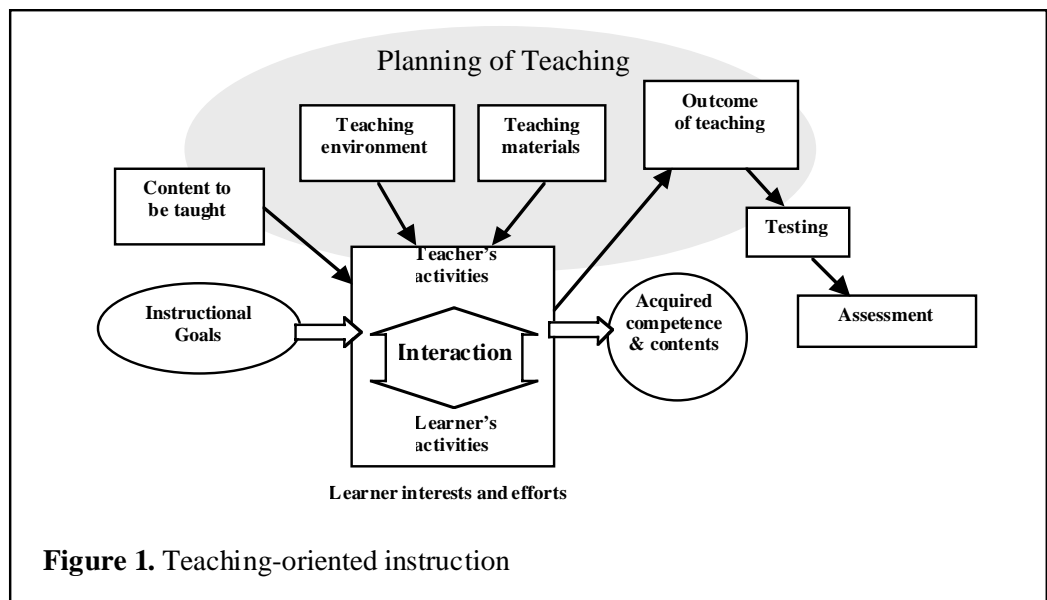
Language is indeed the most convenient means for conveying ideas and experiences within a community where everyone speaks a common language, but its effectiveness diminishes outside the community of same-language speakers. Audiovisual images, however, represent a powerful means of overcoming language barriers, though they require interpretation in a spoken language. Successful implementation of distance learning among participants at different workplaces depends on efficient and effective communication. Well-defined signs and symbols offer promising tools for different communi-

ties to describe actions, share ideas and communicate experiences to the public as well as within a circle of specific professionals. Terminologies, signs and symbols are commonly used to form a professional society in order to share knowledge and experiences.

In the following section I describe a trial distance education project that employed a common system of symbols in a Japanese setting with the goal of determining its feasibility before advancing to the next stage of implementing the project in an international setting. The project introduced here was limited to large classes of Japanese students. The purpose of the project was to use graphic models to change students’ perceptions, through a process of progressive revisions, from a teacher-oriented approach to instruction to a learner-oriented approach.

**A framework to describe instruction**

The proposal described here aims to provide pre-service teachers with a new framework that promotes innovative instruction in daily teaching, and acts as a means of communicating these ideas with colleagues among different workplaces. A process of revising is vital to improving an initial lesson plan by referring to the actual situation observed in the class, then using the refined plan to move the students to their intended instructional goals. Student teachers start by writing



**Figure 1.** Teaching-oriented instruction

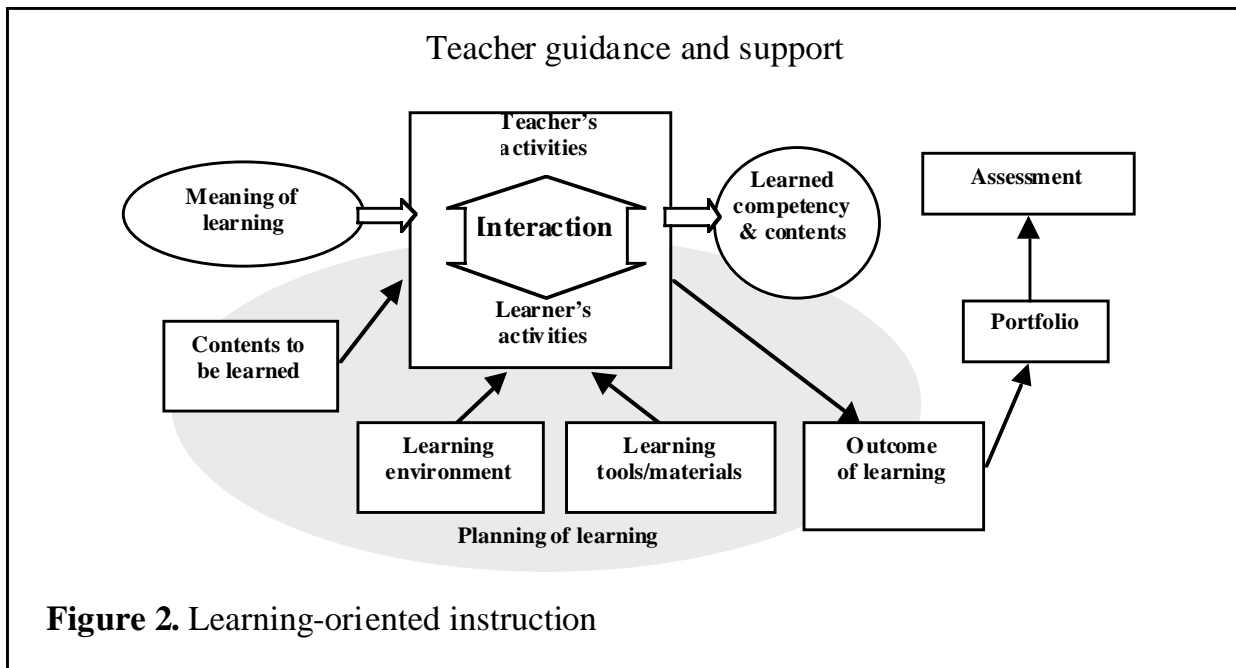
lesson plans using pictorial images. They then proceed to the next stage of using keywords or concepts, representing ideas in graphic models and describing judgment and explanations in empirical statements. This framework was applied successfully to my classes in 'Instructional Technology' at Bukkyo University in 2000 and 2001. The following sections provide a series of graphical models along with explanations of their functions.

At the very beginning of the course, I start by describing educational goals, then proceed to specifying instructional objectives, predicting teaching and learning events, selecting teaching materials and planning outcome assessments. This is the procedure that is most widely adopted among Japanese teachers. It represents a design for conventional, teacher-oriented instruction. It is efficient when it comes to designing lessons for transferring knowledge from teachers to students. However, students attending this sort of class tend to be passive and follow the lesson without any clear awareness of the meaning of what they are learning. Figure 1 shows a model that describes the procedure of teacher-oriented instruction and depicts the relationships among the elements.

Learner-oriented instruction, on the other hand, starts from the students' understanding of the mean-

ing of learning. Teachers have to estimate students' expectations or interests at the beginning of the course. They proceed by planning flexibly and making appropriate adjustments and end by using assessment techniques that accommodate unexpected results. Teachers and students, who are often unfamiliar with this type of instruction, are frustrated by the ambiguity entailed by this kind of planning. They have some rough ideas concerning instruction, but cannot express themselves in written form, at least not at the beginning. This model is illustrated in Figure 2.

In actual classroom situations teachers and students always interact with each other and take the initiative to plan their teaching and learning activities. Teachers start from an assessment of their own intentions and educational aims, anticipate students' behavior, and follow up by taking appropriate actions. Descriptions of the teachers' intentions and analyses of their instructional objectives, however, do not necessarily motivate the students nor offer an effective account of the scope and sequence of learning. On the contrary, when teachers start from an understanding of the students' intentions and activities, teachers are better placed to arrange an environment that will support the students' learning. In this kind of planning, we can describe the physical and psychological environ-



**Figure 2.** Learning-oriented instruction

ment for a more effective learning by means of models and propositions. Integration of these two planning perspectives—teacher-oriented planning and student-

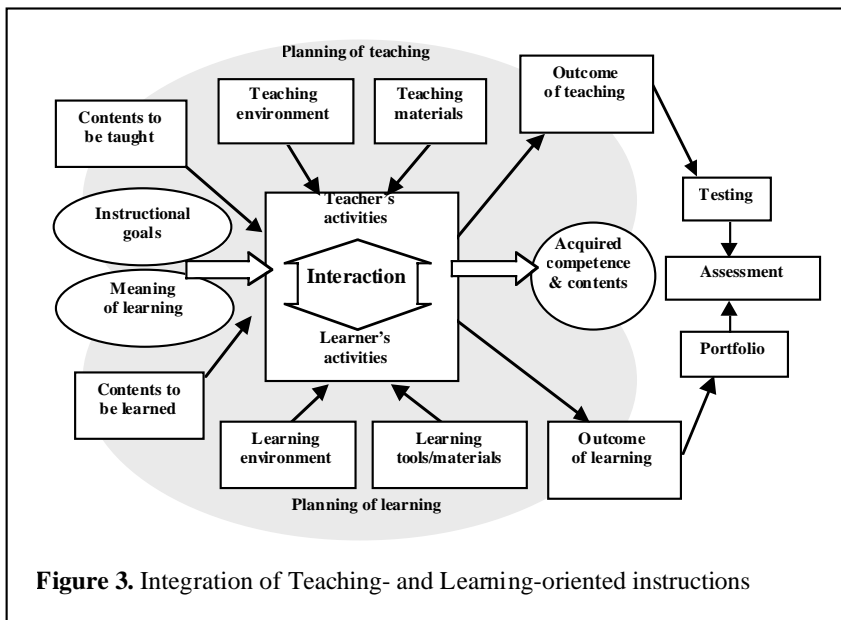
from school to school, from society to society and from nation to nation. It is a straightforward matter to express these ideas as expectations and philosophical

views, but hard to reach a common, agreed-upon method of how to represent educational goals and actual teaching or to describe instructional actions that may occur in the teaching process. Descriptions in written normative form are easy to read, but difficult to modify and revise with reference to observed events in an actual classroom.

In conventional lesson plans, teachers are able to describe educational aims and goals, instructional contents, teacher activities, learner activities, teaching materials and other remarks. But when teachers start to develop their ideas of educational norms, they find that the value system differs from teacher to teacher, from school to school, from society to society and from nation to nation. It is a straightforward matter to express these ideas as expectations and philosophical views, but hard to reach a common, agreed-upon method

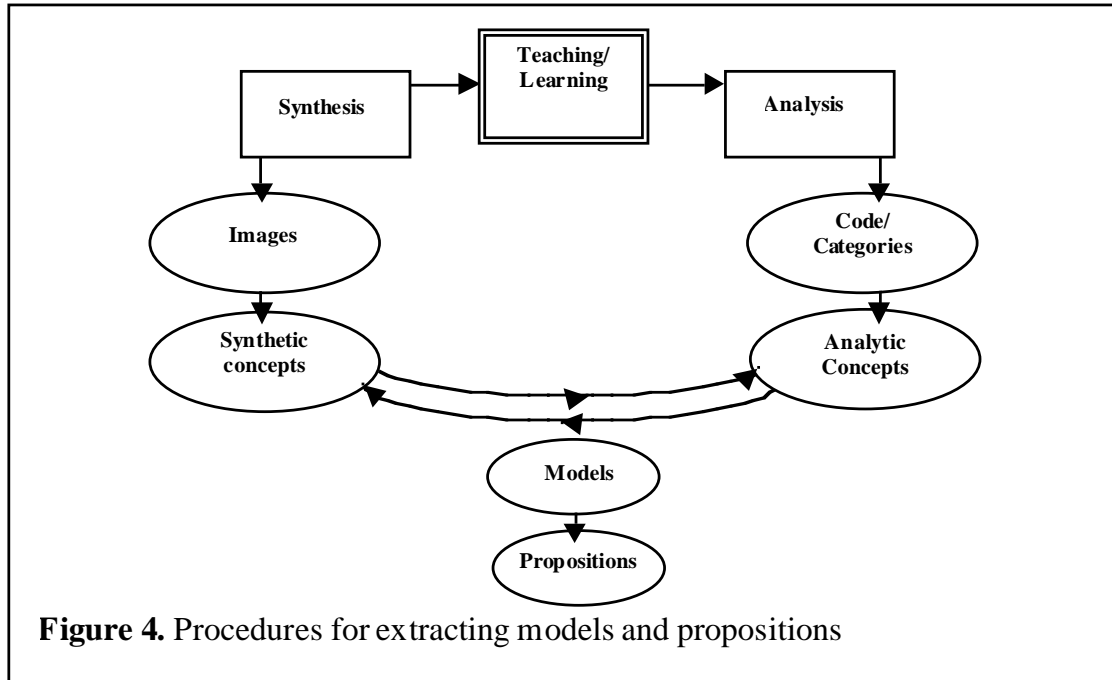
of how to represent educational goals and actual teaching or to describe instructional actions that may occur in the teaching process. Descriptions in written normative form are easy to read, but difficult to modify and revise with reference to observed events in an actual classroom.

On the other hand, when we start to develop lesson plans from a prescriptive model of teaching and learning, it is not difficult to reach agreement on symbols, concepts, models and propositions or empirical statements to describe the lesson plan. The configuration of symbols, concepts, models and propositions, and empirical statements constitutes a structured lesson plan and represents specific procedures to follow in order to achieve one's educational goals. Keywords and graphical representations of instructional design greatly support teachers in developing their ideas and revising them regularly. These concepts can be described in symbols and/or keywords, and the models can also be represented by symbols and concepts. By employing this method, each symbol, concept, model and proposition is free from any specific value system. Thus, the educational value of



oriented planning—into one comprehensive model of instruction is represented in Figure 3. This integrated procedure for designing instruction requires students to reflect and plan in two directions simultaneously. First, the model starts with teachers' intentions concerning instruction, proceeds to a formulation of teaching strategies, and ends with the development of concrete lesson plans. Secondly, the model includes direct observations of students' learning, analyses of activities and predictions of subsequent learning events arising from instruction. Finally, actual classroom experience is added, and both directions are taken into account to generate lesson plans. The design procedure proposed here consists of five components; images, codes/categories, synthetic and analytic concepts, models and propositions, which form sequential steps as shown in figure 4.

In conventional lesson plans, teachers are able to describe educational aims and goals, instructional contents, teacher activities, learner activities, teaching materials and other remarks. But when teachers start to develop their ideas of educational norms, they find that the value system differs from teacher to teacher,



teaching is testified to after the construction of the lesson plans, not before their construction.

#### Moving Toward Autonomous Learning for Teacher Education

It is hard to change the framework of a familiar teaching style or to accept new types of instruction, even in teacher training colleges. The present correspondence courses at Bukkyo University have fifty years of history based on instruction that employs textbooks, report correction and correspondence with students. This system has proved effective in transmitting subjects such as educational philosophy, educational psychology and educational history, but it is ineffective in more practical areas of study such as practice teaching and curriculum planning. Now is the time to explore new communications systems in the teaching profession that share our experience in moving from teacher-centered instruction to learner-centered instruction.

The three instructional trials that I describe in the section following this one illustrate typical lessons in two courses that I teach: *Introduction to Instructional Technology* and *Introduction to Instructional Design and Analysis*.

My aim is to study the feasibility of using instruc-

tional symbols with large classes in a large lecture room, not in an experimental setting.

My experiences show that new approaches to instruction require from three to five years to prove their feasibility in different situations. In these situations, it is impossible to keep the same experimental settings to validate the feasibility of the new attempt. The class sizes of the experiments range from 78 students to 228 students. Computer facilities differ from one class to another. Yet in spite of the different settings, the same symbols and figures are used to direct instruction in the expectation that these methods can be transferred to the distance education situation. The following principles were gradually introduced during the course of the lessons. Each allowed a smooth transition from teacher-centered instruction to learner-centered instruction and were applied in three sequential trial courses:

#### **Educational principle: The right to learn depending on one's capabilities.**

Article 26 of The Constitution of Japan maintains that *All people shall have the right to receive an equal education* corresponding to their ability, as provided by law. A strong governmental policy that promotes national education as a duty has hampered the development of teachers' initiatives

while strengthening their passive attitudes towards the instructional planning needed for educational reform. Students also tend to think of education as their duty rather than their right. It is essential to transform this attitude into a more autonomy-minded attitude so that teachers take more responsibility in planning lessons. Japanese education is still paternalistic in nature, from elementary to higher education.

**Social factors: the learning community and the learning organization.**

The school has two aspects, that of a community and an organization. The community aspect tends to be stable and maintains its cultural heritage, while the organization part acts as a means to enhance its own functions as well as to encourage change. The school is expected to be a learning center for its community and to adapt progressive features to correspond to society's changing, growing needs and the learners' expectations.

**Developmental steps: images, models and empirical propositions.**

The traditional procedure for developing instructional programs begins with the instructor identifying educational goals and instructional objectives. However, as students begin to identify these goals and objectives, the instructor must clarify expectations and explain their meaning. This means that although the instructor often begins with ambiguous images, they are able to clarify them gradually in accordance with the students' progress, identifying the real learning events and describing them in the form of models and empirical propositions. These images, models and propositions are evaluated during and after class, stored in a computer and used to design the next lessons.

**School factors: educational ideals, teacher competence, realities and constraints.**

Education students are expected to plan a virtual school, but find difficulty in taking educational ideals, teacher competence, realities and constraints into account. The task is too complex for novice teachers to describe all the relevant factors and should be tackled in more advanced courses. Educational ideals should correspond to teachers'

levels of competence and the realities and countless constraints that schools face on a daily basis.

**Team learning principles: autonomy, collaboration, contribution, responsibility and respect.**

In order to change the students' passive attitude into one of active learning, five principles are introduced from the beginning of the courses and repeatedly referred to during the semester. They are: autonomy, collaboration, contribution, responsibility and respect.

**Instructional components: meaning, activities, contents, environment, tools and outcome.**

The instructional process is a complex one. It is hard to design a complete process from the beginning. However, by using a list of components stored in an Excel file, students can draw on some of the elements to be considered in instructional design.

**6x6xN group formation and instructional management.**

The 6x6xN arrangement is based on the typical size of classes in Japanese schools, which ranges from 25 to 40 students. My classes tend to be much larger. Practical experience has taught me to reorganize virtual classes into more manageable units (based on the smaller sized school classroom), and so I divide them into six groups of six students. Six groups constitute a virtual class. In a course with 72 students, for example, I would create two virtual classes (6x6x2). I have found that Microsoft Visio's organizational diagram sheets offer an effective tool to manage this specific arrangement of groups of six teams.

I have experimented intensively with the above framework over the past three years in my *Introduction to Instructional Technology* course to test its feasibility. The first stage started with 228 undergraduates, and advanced to a course for 78 students in a laboratory well equipped with computers. Finally, I employed it in a course for 108 students in an ordinary classroom connected to a small computer laboratory.

**Three Instructional Trials**

The common goal of these trials was for students in the various courses to propose a virtual school as well

as create an example of a lesson plan that they would use to conduct a class on a specific subject or topic. In each case, three actions were taken to move the students' introductory lesson plan from a conventional teacher-centered model to a more learner-centered one.

#### **The first trial:**

This course, *Introduction to Instructional Technology 2000*, involved 228 students in a lecture hall designed for 300. The class was arranged into 6 large divisions containing 6 groups of 6 and 7 member teams working in independent units. Within each division of 6 teams, students exchanged ideas in poster sessions and presented their works on the walls of the classroom. Their aim was to develop their ideas of a virtual school and create a lesson plan. In designing their virtual school, each group was expected to clarify its educational aims, describe the facilities available in the school, and develop a timetable of lessons. Students used the Internet to visit the homepages of different schools and had direct contact with actual schools to use as a model for their virtual schools. Students endeavored to depict their ideas using illustrations and figures. I avoided providing an overwhelming amount of information or forcing the students to memorize and understand the meaning of what was presented.

#### **The second trial:**

This course, *Introduction to Instructional Design and Analysis*, involved teaching 78 students in a computer lab arranged into two virtual classes. The aim was to ascertain the effectiveness of computer networking for group-work and to judge the quality of student reports. Computer facilities were provided and each student could use PowerPoint and Word to express his or her ideas. However, in spite of the rich technological setting, the images of virtual schools produced by this class were not as good or as developed as those generated in the first stage. In this configuration in which students sat at computer displays, student discussions were not intense enough or sufficient to generate new ideas. This experience showed that group discussion is indispensable in exploring issues and ideas in creating a virtual school; adequate technological facilities do not necessarily guarantee a high quality of instructional products.

#### **The third trial:**

The third course, *Introduction to Instructional Technology 2001*, was conducted with 108 students (6x6x3) in an ordinary classroom equipped with a projector and screen. The aim was to ensure effective team working and quality work in designing a virtual school, as well as producing examples of a lesson plan on a specific subject or topic. Students were also able to use a separate computer lab equipped with about forty computers. By using the group-mailing function of cellular phones, students were able to communicate with each other to arrange work meetings and to exchange ideas after class. Each virtual class of six teams conducted their poster sessions independently. There was no interaction between these classes, although they were often in the same room. The group arrangement meant that it was unnecessary for each student to have a computer. They were, however, able to contribute to the project to the degree that they were competent in using communication technology.

#### **Conclusion**

Bukkyo University is currently facing the critical issue of having to revise its correspondence courses by integrating them more closely with our full-time offerings and, at the same time, developing a framework for distance education. Information and communication technology and research on teaching and learning will enable us to develop entirely new approaches to instruction that accommodate greater numbers of students who come to us with a greater range of experiences and variety of interests. In this evolving scenario, the lecture approach to instruction is neither attractive nor effective as it precludes active student involvement and quality learning. The above sequence of instructional trials has helped to reveal the importance of student discussion in situations that promote creative learning and produce visible and viable instructional outcomes in university teacher training courses.

Effective on-line learning in teacher education can be reproduced and validated in regular face-to-face classrooms, which has the advantage of allowing

more oversight and opportunities for investigating the processes of on-line teaching and learning. In fact, this is a good way to ensure that autonomous learning within groups is taking place while using ICT, and that it can be implemented in actual distance learning situations. The next step of this project, Trial Four, is to implement the above procedure for in-service teacher training in the Kyoto district.

#### References

- Boak, G., and D. Thompson. (1998): *Mental Models for Management*, Random House UK Ltd. (translated into Japanese)
- Johnson-Laird, P. N. (1983): *Mental Models*, Cambridge University Press (translated into Japanese)
- Nishinosono H., E. Hino and T. Fujita. (1978): Two Symbol Systems for Designing Instructional Process, *Educational Technology Research*, 2 (1).
- Nishinosono H. (2000). Integration of Working, Learning and Researching in Teacher Education. Paper presented at SITE 2000, San Diego, USA.
- 



**Haruo Nishinosono** is professor of education at Bukkyo University, Kyoto, Japan. His research interest is on instructional technology, especially teachers' competence.

---