An analysis of the use of interactive video in education of cross-cultural negotiation
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Published: 01/01/1988

Document Version
Publisher’s PDF, also known as Version of Record (includes final page, issue and volume numbers)

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Download date: 12. Dec. 2018
AN ANALYSIS OF THE USE OF INTERACTIVE VIDEO IN EDUCATION OF CROSS-CULTURAL NEGOTIATION

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PAPER PRESENTED
AT THE 2ND INTERNATIONAL LSP CONFERENCE

AUGUST 5, 1988
EINDHOVEN, THE NETHERLANDS

EINDHOVEN UNIVERSITY OF TECHNOLOGY
DEPARTMENT OF PHILOSOPHY AND SOCIAL SCIENCES

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OCTO-report 88/03
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ABSTRACT

Computers are introduced in educational settings at an increasing rate. One advantage of this new medium is clear: learning and educating can take place in an interactive, individual, teacher-independent way at any time. Most of the forms of computer assisted instruction (CAI) try to imitate individual teacher-student dialogues, and thus they try to reach the same educational goals by new means. However, a second advantage of new media is that new goals may be reached, for example when complicated models of the world are taught by means of interacting with a computerized simulation.

Previous research in a physics domain (Electricity and Magnetism) has taught us that educational goals can be stated in terms of functional knowledge types. For Electricity & Magnetism we distinguished situational, declarative, procedural and strategic knowledge. Success of students in problem solving tasks showed to be related to the presence and organization of these knowledge types in memory.

In the present study we will try to extend this theory of functional knowledge types to a not directly technological domain: cross-cultural technical and business negotiating. One of the facts that is clear is that 'situational knowledge' (knowledge of the problem statement) will be extremely important in negotiating. Showing culturally different situations, urging the student to select relevant characteristics from these situations and helping him to connect the right facts and actions to these characteristics can be put into a CAI program.

However, one of the disadvantages of CAI with standard personal computers is the (low) resolution of the screen. We will show how this can be overcome by coupling the CAI program with a video disc system. The video disc system we will present is French made and meant to train (French) purchasers into the techniques and strategies of technical and business negotiating. We will demonstrate how it can also be used in a cross-cultural setting.

1. INTRODUCTION

The present study analyzes the domain of cross-cultural negotiating in terms of functional knowledge types. On this basis we argue that interactive video is an excellent medium for teaching and training this domain.

In this article we first will present an overview of the theory of functional knowledge types. Then some general advantages of computer assisted instruction (CAI) will be treated. Subsequently we will discuss the relevancy of the theory of functional knowledge types for the domain of cross-cultural negotiating. And finally it will be argued that CAI, and in particular Interactive Video, is a good means for teaching this domain. As an illustration a French video disc will be demonstrated.

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2. THE THEORY OF FUNCTIONAL KNOWLEDGE TYPES

Psychological research into learning and problem solving has long been concerned with observable behavior only. This paradigm, called behaviorism, was predominantly present in the United States of America, its most famous representative being Skinner (Skinner, 1968). Behaviorism, however, ran into problems when complex human behavior, like solving domain specific problems, had to be explained. A competitive paradigm, of European origin, was the Gestalt theory. In the Gestalt theory attention is also paid to non observable mental behavior. New techniques like 'introspection' and 'thinking aloud' (meaning reporting on your own mental activities) were introduced. However, in the Gestalt paradigm the tasks studied were artificial and mostly domain free. In the sixties a new paradigm originated, the information processing paradigm. In it explicit and extensive attention is paid to the study of mental processes, especially in complex, domain dependent tasks. This paradigm is still prevalent in today's psychological research.

At the Eindhoven University of Technology we have a project on knowledge acquisition and problem solving in Physics for first year University students. The specific domain chosen is Electricity and Magnetism. The project has now run for several years and has resulted in a number of papers (de Jong & Ferguson-Hessler, 1984, 1986, 1987, 1988; Ferguson-Hessler & de Jong, 1983, 1987, 1988). In this project 4 main aspects of learning and teaching are the subject of research. These are:

a. Problem solving behavior

The criterion tasks that students receive in their first year of study are examinations consisting of problems. These examinations test whether the knowledge students have gained in the learning or knowledge acquisition process is suitable for performing the criterion task. We have examined the problem solving process of students when they perform an examination in physics. In educational settings, testing the knowledge base of students means introducing artificial (examination) situations. Sometimes, however, as in cross-cultural negotiating, these tests are real-life situations.

b. The knowledge base

When a student enters an examination (be it an academic examination or a real-life situation) the 'equipment' he has is his/her experience and knowledge. In some of our studies we carefully examined the content and organization of the knowledge bases of students.

c. The learning process

Knowledge bases do not emerge spontaneously. Students have to perform all kinds of actions to create a knowledge base. This is what we call the knowledge acquisition or learning process. In one of our studies we carefully examined the learning process of students studying a text on a physics subject.

d. The instruction process

Preceding the learning process is the instruction. This can be explicit instruction, like in lectures, but also more covert ways of instruction, as in designing and writing books or computer assisted instruction. In one of our studies we observed the instruction behavior of several experienced physics teachers.

These 4 aspects of learning and teaching depend on each other quite heavily. The ultimate problem solving behavior at a criterion task is strongly influenced by the knowledge base of the problem solver. This knowledge base in its turn, has evolved by means
of using specific learning processes. Finally, one of the factors influencing the learning process is the way instruction is taking place.

Figure 1 gives a schematic overview of the interplay of all of the 4 aspects mentioned. In this figure we've depicted the aspects of problem solving behavior and knowledge base with more detail.

![Figure 1. An outline of the instruction, learning and problem solving process.](image)

In Figure 1 the pivot on which everything hinges is the problem representation (see also Egan & Grimes-Farrow, 1982). This is the mental representation of the problem by the problem solver. This representation is a combination of the information provided in the problem statement and the knowledge from the knowledge base of the problem solver. In this sense it has much in common with the concept problem space from Newell & Simon (1972). The problem representation is not seen as static, but it develops as the problem solver is solving the problem.

A pivotal role is also played by the knowledge base of the problem solver. Following study of literature (e.g. Messick 1984) and an analysis of the domain, a division of the knowledge base into functional knowledge types was made. A distinction such as this

2 Of course we realize that the learning process and problem solving behavior will also be affected by individual characteristics of the problem solver (cognitive skills, and noncognitive characteristics such as motives and temperament), of the problem solving context, and of course of the problems to be solved.
one can also be found in literature on representation of knowledge for the design of
so-called expert systems. There this functional level of the description of knowledge is
denoted as the epistemological level (Brachman, 1979; Wielinga & Breuker, 1986; de Jong,
de Hoog & Schreiber, 1988). For problem solving in a physics domain we distinguished
situational knowledge, declarative knowledge, procedural knowledge, and strategic know­
ledge. These knowledge types all play their own parts in the problem solving process.

The first knowledge type that comes into play is situational knowledge. Situational
knowledge is knowledge of problem statements as they typically appear in a specific
domain. This knowledge helps the problem solver to construct a first representation of
the problem by sifting relevant knowledge from the problem statement. This process is
known as selective perception. Also, information can be added to the representation of
the problem statement. Here we come to the next two types of knowledge: declarative
and procedural knowledge. Declarative knowledge comprises knowledge about the theory
of the domain (concepts, principles, laws etc.) and is therefore the knowledge that is
predominantly present in text-books. Procedural knowledge concerns all the actions a
problem solver is allowed to take within a domain. The final type of knowledge is stra­
tegic knowledge, this is knowledge about how to regulate the problem solving process. It
divides the process in stages and tells the problem solver what to do in each stage.
Therefore, Schoenfeld (1979) calls it a 'managerial strategy'. Strategic knowledge differs
from other knowledge types by the fact that a specific strategy holds for a number of
problem types, whereas the other knowledge types are specific for one type of problems
or at least a restricted range of problem types.

2.1 Experimental research

On the basis of the theory outlined above we've conducted several studies for which the
main results are reported here. Our research strategy has been to compare good and
poor performing novice students in order to infer a model of the good problem solving
process, the good knowledge base and the good learning process.

In one of our first studies (de Jong & Ferguson-Hessler, 1984) we extensively examined
the strategies students used when solving problems at an examination in Electricity and
Magnetism. Subjects were 16 first year students in Electrical Engineering. They were
instructed to think aloud while solving the examination problems, and their utterances
were tape-recorded. In this study we also introduced a training program in order to
enhance the strategic behavior of students. Problem solving strategies of students were
deduced from thinking aloud protocols. This was done for a group of students that fol­
lowed the training program and for a control group, both before and after the training
program. Results showed that before the training program both the experimental and the
control group used a strategy that we denoted as 'kick and rush'. This means that stu­
dents analyze the problem statement very quickly, choose a formula and see where it
ends. If they are not successful they repeat this sequence again. The control group did
not change their strategy spontaneously between both measures, neither did the ex­
perimental group adapt its problem solving strategy as a result of the training program.
This showed that strategic behavior of students is not easily influenced. Moreover, when
we compared problems that were solved successfully with problems that were not suc­
cessfully solved, we found that the 'kick and rush' strategy was used in both cases. We
therefore concluded that strategy use or the regulation of problem solving behavior, for
the time being, should not be our first interest. Moreover, we found that poor students
made specific errors when using the other three functional knowledge types. Therefore,
in our next study we concentrated on the three functional knowledge types that were
more domain related, namely situational, declarative and procedural knowledge.

In a second study we compared the presence and organization of the functional know­
ledge types (situational knowledge, declarative knowledge and procedural knowledge) in
the knowledge bases of good and poor first year University students. An analysis of a subdomain of Electricity and Magnetism was made and the domain was rewritten in terms of these knowledge types. Also, an ideal organization was made, based on the schema theory by Rumelhart (1980) and Chi, Feltovich and Glaser (1981). This organization form divides the domain into problem schemata. We defined each scheme as existing from situational, declarative and procedural knowledge. An extensive description of the various knowledge types and problem schemata can be found in de Jong & Ferguson-Hessler (1986). Each knowledge element was written on a card and students were asked to sort the cards into piles. We found that good problem solvers essentially organize their knowledge according to the predefined schemata, whereas poor problem solvers use superficial characteristics when sorting the knowledge elements. These results were later confirmed in a large replication type study (Ferguson-Hessler & de Jong, in preparation).

In a third study we tried to explain the above mentioned results from differences in learning processes between good and poor performers. A group of first year University students (n = 10) studied a text in a physics subject and were urged to report on their study processes at regular intervals in the text. Their utterances were scored according to an analysis scheme that contained descriptions of 32 different study processes. Moreover, for each utterance, it was assessed which of the 4 functional knowledge types was involved (situational, declarative, procedural and strategic knowledge). The results of the analyses of study processes and knowledge types were related to the performance level of the students.

The results showed that both good and poor performing students were equally active; both groups apply the same number of study processes. However, study processes that require extensive mental effort (so called deep processes such as “confronting the text with other ideas or counterarguments”, or “observing seeming omissions in the text”, were more frequently applied by good students. Another striking difference between good and poor performers was their attention to the different knowledge types in the text. Good performers compared to poor performers pay more attention to situational knowledge and procedural knowledge. Poor performers pay more attention to declarative knowledge.

From our studies we can conclude that the presence and organization of various knowledge types in the knowledge base of a problem solver is correlated to performance level. Instructional material should take into account that it covers these findings explicitly, in order for poor students, who tend to underemphasize the importance of certain knowledge types and the organization in memory, to gain the same knowledge base as good students presently do.

3. COMPUTER ASSISTED INSTRUCTION

A new medium that is rapidly introducing itself into society and the educational institutions is the computer. Computers are used in education for a number of reasons, e.g. for administrative goals (for example processing of examination results), for giving demonstrations, and as a tool (used by both teachers and students). Another form of computer use in education is as an educational device. This form of computer usage, called Computer Assisted Instruction (CAI), is defined by de Jong & Gerritsen van der Hoop (1988) as: "applications that allow an interaction between computer and student and in which the computer offers a more or less substantive part of a subject domain, and/or hears the student, and/or helps with practicing skills." A recent survey in the Netherlands (de Jong, Pilot & van Andel, 1988) showed that the use of CAI is increasing very rapidly in Dutch higher education. Now then, what are the possible ways to use CAI and why use it at all? These two questions will be treated in the next two subsections.
3.1 Forms of CAI

In literature (Alessi & Trollip; Kearsly, 1986) several main forms of CAI are distinguished. Although it is possible to create a new category for each variation, three forms of CAI are salient: drill and practice, tutorial, and simulation.

Drill and practice.
CAI in the form of drill and practice goes back to the behavioristic teaching machine (Skinner, 1968). In drill and practice programs, questions are posed, the student answers them and feedback is given to the student. By repetition of questions and introduction of (small) variations in them a criterion performance is reached. A domain that is especially suited for this type of CAI is that of learning the meaning of words in a foreign language. However, also within sciences drill and practice is used (cf. Arons, 1986). In de Jong, Pilot and van Andel (1988) it was concluded that drill and practice is quite frequently used in medical science.

Tutorial.
In tutorials questions are posed too, but here they are coupled with the presentation of information from the subject domain. The default form of a tutorial is that a student is presented some information (which may be in textual or graphical form), after this some questions are asked, the student receives feedback and his learning path is adjusted to the level of competence he has reached. For example when a student has given some wrong answers he may be led to a previous part of the course or to a module especially designed to remedy his misunderstanding. Tutorials are the most common form of CAI.

Simulation.
With simulations students interact with a model of construction, phenomena, design, process etc. The student is allowed to assign values to parameters and variables from the model and he is presented the results of the manipulations by the computer. The goal of a simulation is that students while interacting with a simulation will gain a better understanding of the underlying model. (Other goals might be to prepare students for man-machine interaction or to have him gain experience with the use of the simulation as a tool.) Related forms of CAI are modelling, and gaming. In modelling the student is allowed to construct his own model (so to state the parameters and the interrelations between them), whereas in simulation the student is exploring an existing model. In gaming the simulation is coupled with the playing of a game in which losers and winners exist or in which the student has to try to maximize his profit (e.g. stock exchange games).

These three forms of CAI are pure forms. In practice, combinations of forms are very common. For example, in simulations an escape to a tutorial mode can be made when it appears that a student does not know a specific concept or a specific relation.

Within the three forms of CAI variations exist. The two main aspects of importance here are control of the course of the program and the kind and degree of feedback. Control of the course of the program can be executed by the student, by the program or there can exist a mixed initiative. A trend in all kinds of computer programs is to make them less restrictive and to place the control in the hands of the user. Programs can also vary in the feedback they give to wrong (and correct) answers of students. The barest form of feedback is to tell the student whether his answer was correct or not. Elaborated forms of feedback provide explanation by means of new subject matter or repetition of a relevant previously encountered part of the program.
3.2 What are the benefits of Computer Assisted Instruction?

Making CAI is a hard job that requires a lot of resources. It is estimated that one hour of multi-media courseware may cost as much as 300 hours of development time. So why make this effort?

CAI has some advantages. One is the high interactivity rate between student and "teacher". In fact, what is tried to be done in CAI is to mimic the one-to-one interaction of a "live" teacher with a student. Education is highly individualized without the presence of teacher. So, students can follow individual education (with individualized feedback and at their individual pace) on a more extensive scale and at any time the student likes it. A drawback is that at present no programs exist that realize the quality of individual education by a good teacher, not even the programs that call themselves Intelligent CAI (Kearsly, 1987).

Another advantage of CAI is not that they mimic individualized education, but that goals can be reached that can never be reached by (even excellent) teachers. This is most clear with CAI programs that involve simulation. Here the program, because of its calculation power, is able to show the student results of his manipulation with a model, that a flesh and blood teacher is unable to give. This same argument holds when the CAI program contains pictorial information that is addressable at an extremely fast speed, as is the case with interactive video disc.

To summarize we can say that the two main reasons to use CAI are individualization of education and the realization of new educational goals.

4. INTERNATIONAL NEGOTIATION

We will now focus our attention on three main aspects derived from what has been discussed above: give a short definition of international business negotiating as related to our concern, examine which functional knowledge types as stated before are relevant in the context of cross-cultural negotiation training and, finally, try to stress why CAI based on interactive video disc technology can be a great help to cross-cultural communication in general.

4.1 An introduction to international negotiation

As defined in Merk (1987) commercial negotiation is a compromise between two diverging interests through which both parties must gain something. One a product or a service (buyer) and the other a financial reward (seller). As Lewicki & Litterer (1985) say a good negotiation should end with two winning parties (win - win) with both partners satisfied about the deal and the relationship. Indeed, a negotiation ending with a 'win - lose' ratio will most likely not have any follow up: the 'winner' will have reached a tough deal this time but probably alienate the 'loser' for future deals. In our opinion international business negotiation should also be a compromise in the cultural dimension with both parties 'winning' on a cultural basis. In this case both parties have to meet each other halfway on their attempt to bridge the cultural gap. They both have to give in something to reach a compromise or, in a less negative term, to reach a synthesis of their cultural differences. (see Figure 2)

A concrete example out of our bicultural experience: in a Dutch - French context the business lunch shows diverging values. The Dutchman would rather swallow his sole sandwiches, gulp his coffee and get down to business. The Frenchman, however, would take the time over this meal and build an atmosphere of cordiality and trust. Here a compromise or synthesis might be a (for the French) somewhat frugal and short meal, but a meal including more than what the Dutchman is used to. Thus both parties will have given in somewhat, without losing their specificities. Culturally speaking the nego-
tiation will already be successful. This last aspect is part of the knowledge acquisition which is important in cross-cultural training.

Figure 2. Model of cultural compromise/synthesis.

4.2 Functional knowledge types in international negotiation

Which types of knowledge are relevant to cross-cultural negotiation training in reference to problem solving? As stated above one can find four main types of functional knowledge in literature (e.g. Messick 1984): the situational knowledge, the declarative knowledge, the procedural knowledge and the strategic knowledge.

As far as cross-cultural negotiation training is concerned there is no doubt that the first knowledge, the situational one, can also be applied. The problem solver, here the negotiator, will have to use a selective perception process to identify and tackle linguistic and cultural problems in a specific international situation. It is for example important to know why a Frenchman becomes nervous at 1 pm if he has not yet been offered a lunch, or why a Dutchman becomes impatient at 5 pm if the discussion carries on and on. Another example of the selective perception process: the difference in terms of cultural and social habits (politeness/friendliness) which exists between an American who calls a stranger by his first name and the Frenchman. In this situation there are two very different values attached to the way of greeting someone else. For the American it is just natural after some first verbal exchanges to call you by your first name, whereas for the Frenchman it may take years to do so. This applies even more in France in a man-woman situation.

Also, the situational knowledge can be used to create the context of the problem situation (this is then an extra dimension added to the interplay of all four aspects as featured in Figure 1). The elements of the context to create can be as follows: place (would you meet someone in his office or in your hotel?), setting (size and format of the table, soft vs hard chair, etc.) and schedule of the negotiation (would you meet a Spaniard at 2 pm or a Dutchman after 5 pm?), language(s) used during the discussions (a Dutchman dealing with a French partner may well use English in the formal, technical conversation but French in informal situations), the attitude to adopt during informal contacts such as the business lunch as illustrated above, etc. This knowledge, or rather absence of knowledge, often causes cultural misunderstandings. Its role in the international negotiation process is very often underestimated.
Declarative knowledge comprises here knowledge about the theory of international negotiation: general trade principles, international laws as stipulated in the GATT-agreements, geographical realities, market specificities, as well as theory about linguistics and socio-anthropology in reference to cross-cultural communication: i.e. tu vs vous in the French conversation, etc.

Procedural knowledge concerns here all the actions the negotiator may take within the frame of a given situation. It is the formal application of the theory (declarative knowledge) in terms of national or company procedures, i.e., the fact that the Japanese tend to take a decision in a consensus, or the fact that American negotiators are often seconded by a lawyer in top negotiations.

Strategic knowledge, finally, refers to the regulation of the whole negotiation process as it can be divided in stages. It allows the negotiator to change and adapt strategies as the negotiation process goes on. He can for example turn the cooperative process into a competitive one, take ad hoc decisions, new initiatives, etc. Although this knowledge embraces a whole range of strategies, these are very much culture-bound and therefore not applicable in any situation. A Dutch negotiator does not negotiate with a German partner in the same way as with a French counterpart. There is no doubt yet that this list is not exhaustive. As de Jong & Ferguson-Hessler (1988) stated, knowledge acquisition behavior and problem solving behavior are also affected by characteristics of the problem solver (the negotiator): cognitive skills and non-cognitive aspects such as personal motives and temperament (the emotional element in any deal, regardless of the negotiator's cultural background) and affected too by specificities of the negotiation context (as mentioned in the previous paragraph) and of the compromise to be reached.

4.3 Computer assisted instruction in international negotiation

We will now examine how these types of knowledge can be trained with CAI-technology and what CAI can bring in the learning process. We will not concentrate on the technical aspect of CAI, nor on the advantages and disadvantages of this medium, as they have been outlined above and in De Jong & Gerritsen-van de Hoop (1988). Also, the type of CAI we will deal with will be the interactive video disc as it is available at the moment: a monocultural video disc combined with a computer program with question & answer drills. In this respect, we have made plans within the Faculty of Social Sciences at Eindhoven University of Technology to set up a combined research project to develop tutorials based on the existing video disc system. These tutorials will enhance the cross-cultural dimension.

We will now speak about the four types of knowledge presented and primarily the situational knowledge. In any kind of conflict resolution, problem solving situation - or in this case business negotiation, the knowledge of the problem statement is extremely important. It makes it possible for the negotiator to identify the problems he is confronted with and then to try to resolve them. This is even more relevant in a cross-cultural situation when one of the partners knows little or nothing about his counterpart's cultural background, for example in the Dutch - French context: as Van der Wardt stated (1985): 'The Dutchman has lost all affinity with the Frenchman'.

There is no doubt however that about 90% of the negotiation process is made up by general market rules, common bargaining strategies and universal values and habits (declarative knowledge), but the remaining 10% - specific negotiation patterns and linguistic and cultural differences which can make a bicultural confrontation fail or suc-

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3 We use 'Banque d'images no 4' and 'Programme interactif EPROM' called 'Initiation à l'achat' from the series 'Relations dans l'entreprise', manufactured by DISTRIMAGE, Paris
ceed - is precisely what must be trained. So what are some of the negotiation models and situations a Dutchman doing business with a French partner must know and identify with? They are both verbal and non-verbal.

Verbal: according to the Dutch, the French speak fast. Even if a Frenchman forces himself to speak slowly at the start of a conversation, the rhetoric characteristic of the French soon prevails. This rhetoric prohibits excessively long pauses, which implies that the French repeat themselves a lot (an advantage for the foreign negotiator because the same argument is never presented in the same way twice). The choice of words, however, is precise. Gradations and nuances are used, which often go unnoticed by the Dutchman, whose speech and behavior appear too blunt, a characteristic which the Dutchman probably sees as properly businesslike.

The French negotiator listens very carefully to his interlocutor and seldom interrupts. This contrasts with the Dutchman, who seems inattentive, and has difficulty placing himself in the position of his French partner, especially when it comes to the latter's line of argument. The digressions the Frenchman likes to make are viewed by his Dutch partner as chaotic deviations - a waste of time, a deliberate attempt to divert his attention or to manipulate him. The figure below illustrates the difference in approach.

![Diagram](image)

Figure 3. Cultural thought patterns. (From R.B. Kaplan, Language Learning, 1966).

Besides, one encounters also a strong hierarchical structure. What are appropriate forms of address? Does the extent of hierarchical rigidity in the language, i.e., the contrast between the use of *tu/vous* and *jij/u* (the French and Dutch familiar and polite forms of address) correspond equally in the two cultures? Dutch does not permit the use of *u* (the polite 'you' form) to someone whom you call by his first name (unlike French: Jean, vous ...) nor does it permit *jij* (the familiar form) with the use of a surname (contrast the French: "Dupont, peux-tu..."). These gradations are often overlooked by the Dutch.

Verbal and non-verbal: the relations between men and women, especially when looked at in the context of a business hierarchy, pose awkward problems. This is a particularly troublesome area for the average Dutch businessman - large numbers of French women hold senior executive positions, especially in banking and insurance, while in the Netherlands there are few women executives. This results in some Dutchmen feeling acutely uncomfortable when faced with a female business counterpart. The woman may not be taken seriously or attempts may be made to treat the relationship non-professionally!

Hierarchy and elitism sometimes go hand in hand. French technical and business schools have a sort of pecking order. It helps to know which institutions your French counterpart has attended, what their status is, to what clique he belongs, etc. These aspects are relatively unimportant in Dutch society.
Non-verbal social customs, finally: greeting a person in France often involves a handshake, with introductions being more hierarchic. Invitations to lunch or dinner are for times different from those the Dutchman is used to and so, of course, is the meal. Presents offered on such an occasion need to be carefully selected. Thus, one does not offer a bottle of wine to a French colleague when invited to dinner. The sensible Dutchman will give a product typical of his country: Dutch cheese, Dutch gin, cigars and the like.

This type of situational knowledge can be very well taught and trained with interactive video disc. The types of video disc we use in the Dutch - French context are French-made and originally meant to train French business managers (purchasers, sellers etc.) into the techniques and strategies of technical and business negotiation in a primarily all-French situation (see Footnote 3). The fact that the contents featured (the whole negotiation scheme between a professional buyer and a seller) are monocultural (French-made for French trainees) does not mean though that it cannot be used in a cross-cultural setting. Obviously, the cross-cultural context of the training session must include the French technical & business culture and refer to it as the target culture as opposed to the source culture which is the participants' own cultural background. This is a contrastive approach dealing with at least two cultures simultaneously. The video disc system has been so far successfully used in different combinations: Dutch - French, Scandinavian - French and North-American - French. It features verbal and non-verbal business situations such as telephone conversation, making an appointment, greeting each other, negotiating and reaching an agreement, etc. in a typical French way - all situations which can cause problems to a non-French. The participants who have another cultural background can therefore view the situations featured and acquire a situational knowledge of the target culture. They can identify to the context and if necessary modify their attitude or style. However, they also have to remain themselves and not try to play the Roman in Rome.

The work method we use is classical. We first have the participants (in this very case Dutch professional purchasers) play the simulation game featured on the disc with real French counterparts. Then we move over to debriefing of the game, comment and analyze the results together with the participants and the French business professionals. As a last stage, we show the game as it is played by the two French managers on the video disc and comment on that.

At this point it must be stressed, however, that the situations shown on the disc serve as a model of a given situation and therefore should not be interpreted as the model of the way the French negotiate.

Also, the video disc can be used outside the class setting, for example in individual or small-group use, provided it is combined with the interactive computer program. The question - answer drills (as developed so far) referring to the situational knowledge as mentioned above make it possible for the trainee to work on his own.

It is a support for both trainer and trainees and must be viewed as such. For the trainer, especially for a non-French one, it gives audio and visual support to his didactics. For the participants, it gives the perception of one method on how to reach the deal, not necessarily as the ideal pattern. Indeed, the same deal may well be reached in another way by partners involved in different strategies, styles, etc. As a matter of fact, the disc features two French negotiators dealing in a French context. So it does not bear any cross-cultural dimension. It is the task of both trainer and trainees to bring this extra dimension into the learning process and analyze it. Would it then be better to use a video disc featuring cross-cultural negotiations as such? It is not so sure because a monocultural context shows to foreign trainees how business people act and negotiate in a given cultural setting, here the French. It features the target culture and serves as a model for different cultures, regardless of the home culture. On the contrary bicultural contents, for example Dutch - French, would tend too much to be-
come the reference to copy and not serve as a mere instance. Besides, one could not use a disc showing Dutch - French situations while training Americans into French negotiations strategies.

As far as the other types of knowledge are concerned, the declarative, procedural and strategic knowledge, we can briefly state that these too can be trained with an interactive video disc based on culture learning. One example out of the declarative knowledge: this knowledge tells the trainee how to use in theory the formal or familiar form of address (tu vs vous). At the same time, as the negotiation or the whole relationship proceeds the trainee may switch from one form to the other. He may call his French partner tu in a tête à tête situation and call him vous later in a large and more formal group. He will then use a combination of two or more knowledge acquisition, a mixture of declarative, situational and strategic knowledge. A combination of declarative and procedural knowledge can be first taught and then trained with a video disc featuring general negotiation theory and cultural and linguistic differences.

5. DISCUSSION

In the previous paragraphs we tried to integrate results form various fields: educational psychology, computer assisted instruction, and cross-cultural negotiation education. The key word in these three fields is education (instruction) and we tried to show that a synthesis of the three fields might yield a better instruction of international negotiation.

The three fields mentioned fertilize each other. Our instructional theory (of functional knowledge types) implies a more structured view on the domain of negotiating. The use of CAI favors such a structured approach. On the other hand it is clear that the domain under study will show incompleteness in the instructional theory as outlined in Section 2 of this paper. To give just one example: In international negotiating a problem solver (negotiator) has considerable influence on the design of the problem statement (the negotiating situation). This fact is certainly not true for our original domain: physics students in examination situations certainly cannot influence the problem statement (they wish they could!). An implication of this is that Figure 1 from this paper has to be extended. Situational knowledge will now not only influence the interpretation of the problem statement but also the design of it.

Returning to the structuring of the domain of international negotiating by means of the theory of functional knowledge types, a first attempt to accomplish this was done in Section 4 of this paper. However, structuring can even go deeper. Having isolated situational knowledge, we might render, by means of a thorough study of the domain, a description of these situations in so-called frames (Fikes & Keller, 1985). A frame consists of a label (denoting a concept) and a number of attributes (slots) of that concept. We will try to develop a generic frame for the domain thus defining all the important attributes of a situation. For each slot the possible values or the range restriction of the values are indicated. Each specific situation can now be described by filling the slots of the frame (a process called instantiation). After having done that we will try to classify frames in classes that can be used to select the appropriate declarative and procedural knowledge from memory. This is where the coupling between situational, declarative and procedural knowledge in memory is important, in other words choosing the correct actions and facts in a situation depends on the organization of knowledge in memory (see Section 2). Situational knowledge is not only important in classifying the situation involved, but also in transferring facts from the situation into attribute values.

Probably this rather technical exposition made you loose contact with the issue of this paper. Let's try to give it some body.

We will call our generic frame the "Negotiation situation". This frame will have quite a few attributes but certainly these four will be present: nationality (quite closely related to cultural background) of the partner, mood of the partner, atmosphere, and time
of the day. Figure 4 displays this frame. Between square brackets we have indicated the possible values of each attribute.

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**FRAME: Negotiation situation**

Nationality: [American, French, Dutch]
Mood of the partner: [relaxed, nervous]
Atmosphere: [cordial, cool]
Time of the day: [value between 0 and 24]

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*Figure 4. Frame notation for negotiation situation.*

What a (novice) negotiator needs to learn is to interpret the cues he gets from the negotiating situation and translate them in terms of attribute values. So when he negotiates with a partner whose nationality he is unfamiliar with and they both speak English, he might infer the nationality from the accent of his partner. Then he fills the slot "Nationality". Now he has a representation of the situation that is only partially filled but that nevertheless might help him to steer his process of selective perception and to fill in the values of other attributes (see also Figure 1). For example when his partner is French and addresses him by his first name, our negotiator might infer that the atmosphere is cordial, and that the relationship has originated long ago and is based on common trust and respect. However, when his partner has the American nationality this inference might prove to be invalid.

While interacting with each other the negotiator tries to fill in all the slots of the frame. Certain patterns of attribute values can be reasons (conditions) to select declarative and procedural knowledge from memory. One part of his declarative knowledge can be: "Lunch is very important for the French". A pattern that might evoke this knowledge is: AND my partner is French AND he act nervous AND time of the day is about 1 pm. The appropriate procedure to use is "THEN invite partner for lunch". Of course depending on the strategy our negotiator uses (cooperative versus competitive) he can adapt his rules (if he uses a competitive strategy the THEN part of the last rule could be "try to force a decision").

We hope this example clarifies our ideas. Having described the domain under study in terms of functional knowledge types, we find that the domain can be excellently trained by means of interactive video. First this will help the novice negotiator to select all kinds of cues from the situation and translate them to descriptive attributes. He does not see the cues in isolation but as they really appear in practice. Using a video disc has the advantage that all the situations on the disc are addressable at a very high speed. Moreover, thanks to the high resolution of the screen, viewing the video disc is comparable to watching television and has nothing to do with the low resolution of a PC screen. When a student does not interpret the situation in the correct way, he can be shown a different situation that fits his interpretation, in order to show that the original situation was interpreted wrong. The video disc can quite easily be embedded in a computer tutorial that tells the students what is the right declarative and procedural knowledge in a shown situation. Next the video can be started again to show how this knowledge can be applied in the situation. The fact that this is really shown is especially important for procedural knowledge, because this type of knowledge concerns actions.

One conclusion from the exercise in this paper is clear. The theory of functional knowledge types and the use of CAI seem very promising approaches for teaching cross-cul-
tural negotiating. However, before this program is actually running, a lot of work still needs to be done.

REFERENCES


Kaplan, R.B. (1966) Cultural Thought Patterns In Intercultural Education (pp. 43 - 62).


