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Ludwig-Maximilians-University Munich, Germany
Institute for Empirical Pedagogy and Pedagogical Psychology
Chair Prof. Dr. Heinz Mandl
Leopoldstraße 13, 80802 Munich
Telephone: ++49-89-2180-5146 – Fax: ++49-89-2180-5002
e-mail: mandl@edupsy.uni-muenchen.de
http://lsmandl.emp.paed.uni-muenchen.de/

Editor: PD Dr. Michael Henninger

e-mail: henninge@edupsy.uni-muenchen.de

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Abstract

Most trainings of communicative behavior focus on fostering the observable speech productive behavior (i.e. speaking). The individual cognitive processes underlying speech receptive behavior (hearing and understanding utterances) thus are often neglected. This is due to the fact that speech receptive behavior cannot be accessed in the midst of a conversation and that its training is very time-consuming. Computer-supported learning environments employed as cognitive tools can help to foster speech receptive behavior. This article discusses the fostering of speech receptive behavior and the possibilities of using software for this purpose. The computer-supported learning environment CaiMan© which is based on these ideas is presented. Finally, seven factors of success for the integration of software into the training of soft skills are derived from empirical research.

Keywords: soft skills, communication training, computer-supported learning environments

Zusammenfassung

Kommunikationstrainings widmen sich meist der Förderung des beobachtbaren sprachproduktiven Handelns (d.h. des Sprechens). Die individuellen kognitiven Prozesse, die dem sprachrezeptiven Handeln (Hören und Verstehen) zugrunde liegen, werden häufig vernachlässigt. Dies wird dadurch begründet, dass sprachrezeptives Handeln in einer kommunikativen Situation nur schwer zugänglich und die Förderung der individuellen Prozesse sprachrezeptiven Handelns sehr zeitaufwändig ist. Computerunterstützte Lernumgebungen können als kognitive Tools die Förderung sprachrezeptiven Handelns unterstützen. Dieser Forschungsbericht erörtert Möglichkeiten und Probleme der Förderung sprachrezeptiven Handelns und des Einsatzes von computerunterstützten Lernumgebungen für dessen Förderung. Darauf aufbauend wird die computerunterstützte Lernumgebung CaiMan© vorgestellt und beschrieben. Abschließend werden sieben Erfolgsfaktoren aus der empirischen Forschung zur Lernumgebung CaiMan© abgeleitet.

Schlüsselwörter: Soft Skills, Kommunikationstraining, computerunterstützte Lernumgebungen

TRAINING SOFT SKILLS WITH SOFTWARE

The training of soft skills*

The term “soft skills” is a label which involves those skills and qualifications exceeding the “hard skills” of a job. Whereas hard skills describe the qualifications directly related to the job, soft skills involve qualifications like teamwork, creativity, self-management, the ability to learn, flexibility, problem-solving and, most importantly, communicative skills (Picot, Reichwald; & Wigand, 1996). This article focuses on the fostering of communicative behavior, which plays a central role among the soft skills.

Most trainings designed for fostering communicative behavior are conducted in face-to-face settings. Interactive exercises, role plays and group discussions are the dominant instructional techniques which are applied in the training of communicative behavior (Brons-Albert, 1995; Fittkau & Schulz von Thun, 1994; Günther & Sperber, 1995). The learner’s performance in exercises and role plays is the focus of reflection and feedback. Yet, mostly it is only the observable part of performance which is addressed and discussed (Jaskolski, 1999). Communicative behavior, however, consists of two parts: speech production (i.e. speaking), which is the more observable part of communicative behavior, and speech reception (i.e. hearing and understanding utterances), which is a more covert process inside the person (Herrmann, 1992; Rummer, 1996).

Speech productive parts of communicative behavior are mostly focussed by trainings due to the fact that they are more observable than the speech receptive parts (Brons-Albert, 1995). Speech receptive behavior occurs more covertly inside the person and consists of individual cognitive skills, which are hardly accessible. Thus, conventional forms of communication training are not applicable for the fostering of speech receptive skills because they depend on the observability and accessibility of behavior. This article is going to show that software can help in training not directly accessible and visible parts of social skills. To illustrate what this kind of software might look like we describe a computer-based learning environment which is designed to foster the individual cognitive skills of speech receptive behavior. By embedding the software into a communication training, it is possible to foster both parts of communicative behavior – speech reception and speech production.

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The fostering of speech receptive behavior

As mentioned above, the individual and not observable part of communication, the speech receptive behavior, is rarely targeted in communication trainings. Training approaches dealing with speech receptive behavior mainly aim at fostering active listening which is in fact a hybrid between speech receptive and speech productive behavior. Active listening means listening to the other person carefully and then paraphrasing or asking questions with the intention of deeply understanding what the other has meant to convey with his or her utterance (Frey, 2000; Hargie, Saunders, & Dickson, 1994; Schulz von Thun, 1994). Thus, it implies giving the other person feedback about what one has understood. This form of feedback is the topic of exercises and reflection in trainings which aim at fostering active listening. Giving feedback, however, is speech productive behavior, even if it is based on speech receptive behavior. Therefore, it is again the more observable part of communicative behavior which is at the center of those trainings. The individual cognitive processes of understanding utterances again are more or less neglected.

The individual cognitive processes involved in speech receptive behavior occur on different levels. According to psycholinguistic theories (Herrmann, 1992), the processes range from the perception of acoustic elements via the semantic identification of words and syntactical identification of grammatical structures to the pragmatic interpretation of utterances. For the training of communicative behavior, higher-order skills of speech receptive behavior like the pragmatic interpretation of utterances are more relevant. Looking at various psycholinguistic models, one can find that they all postulate different pragmatic aspects of meaning which means that an utterance can have several different connotations. These different aspects of meaning can be found in every single utterance and thus be the basis of interpretations. Interpretations of utterances focussing on the different connotations, however, can often be the cause of misunderstandings. This may be illustrated by an example. In a car nearing a crossing, the following dialog takes place: The husband says to his wife who is driving the car: “The traffic lights are red”. As a reaction to this statement his wife explodes: “You always tell me how to drive. I’m able to drive without you constantly intervening. If you don’t have confidence in the way I drive, you might as well walk home!” If we look at this scene, we see that the situation escalated rapidly. What seems to have happened is that the woman felt criticized by her husband’s remark and that this particular understanding of his utterance caused her to react rather aggressively. In order to avoid such aggressive reactions, which might lead to a conflict, it seems necessary to develop a more differentiated understanding of utterances. This implies that the a speaker with good speech receptive abilities can take the various aspects of meaning contained in an utterance into account. In order to develop such a

differentiated understanding, the learners need to be able to analyze speech utterances according to different aspects of meaning. But which aspects of meaning should be differentiated? According to which criteria? There are several models which can be found in the literature. Among the most prominent approaches to be found, are the models of Bühler (1934), Watzlawick, Beavin, and Jackson (1967) and Schulz von Thun (1994).

Karl Bühler (1934) postulated three different aspects of speech in every utterance: what the speaker says about himself (expression), about what objects or facts the speaker informs the listener (representation) and what the speaker wants the listener to do or to think (appeal).

Watzlawick et al. (1967) made a distinction between two aspects of interpersonal communication by differentiating between the content of an utterance and what is said about the interpersonal relationship of the conversational partners.

The German psychologist Schulz von Thun (1994) combined the models of Bühler and Watzlawick et al. (1967) and postulated four different aspects of human language: the aspect of interpersonal relationship, the aspect of respresentation, the aspect of self-expression and the aspect of appeal.

In our training approach for fostering a differentiated understanding of speech utterances, the participants learn how to analyze speech utterances according to the model of Bühler (1934). An earlier version of the learning environment worked with the model of Schulz von Thun (1994) but the problem was that the four levels could not be separated clearly by the learners. The model of Watzlawik et al. (1967) exceeds individual cognitive processes because it pays attention to the level of interpersonal relationship. This level involves the mutual background and history of the conversation partners which is difficult to analyze for an outsider. Since our aim is to foster the individual cognitive processes of speech receptive behavior, the theoretical framework of Bühler (1934) was chosen as a consequence: This model provides a comprehensive and rather practicable model of the different levels or functions of human language and is based on individual cognitive processes.

Thus, our learning environment CaiMan© aims at fostering a differentiated analysis of conversational utterances on the basis of the model of Karl Bühler (1934). The learners should not only gain knowledge about the model of Bühler, but learn to apply it as well. Yet, it is easier to gain knowledge about com-municative behavior than to change the actual behavior in everyday situations (Henninger & Mandl, 2000). This means that the learner often knows which beha-

vior might be effective and adequate in certain situations but is not able to perform this behavior and thus returns to an older, rather dysfunctional behavior. One of the reasons for this described gap between the knowledge about behavior and the actual performance of this behavior can be the automaticity of communicative behavior (Antos, 1996; Herrmann, 1992; Leontiev, 1981).

In everyday life, communicative behavior occurs quickly and the individual rarely has to think about how to speak or how to understand utterances. This is due to the fact that the underlying communicative skills are highly automated (Antos, 1996; Herrmann, 1992; Leontiev, 1981). Thus, the individual is able to understand utterances even in complicated and stressful situations like debates or controversies without having to think about how to do this. The automaticity of communicative behavior enables the use of language in complex situations but also makes communicative behavior difficult to change. According to the literature (Antos, 1992; Leontiev, 1981; Schooler, Ohlsson, & Brooks, 1993), automated skills can be de-automated by bringing the steps of action into consciousness. The de-automated skills can subsequently be changed by reflecting the own behavior. In order to allow the learner to "function" in everyday life, the skills then have to be re-automated again. This can be achieved by repeatedly training and exercising the acquired or modified skills (Hacker, 1998; Leontiev, 1981). In short, due to the automaticity of communicative behavior the following steps are necessary for changing it:

- bringing the actual behavior into consciousness
- reflecting one's own behavior
- exercising and training the new forms of communicative behavior

One possibility for bringing automated cognitive processes like communicative behavior into consciousness is to verbalize them (Schooler et al., 1993). With respect to the de-automation of speech receptive behavior this means that the learners should verbalize what they have understood. The reflection of these processes can be supported by supplying them with other solutions like those of an expert, for example. The learners can compare their own verbalized solutions with the expert's solutions and thus gain a basis for their reflection (Henninger & Mandl, 2000).

It seems difficult, however, to bring speech receptive processes into consciousness, reflect them and to take part in a conversation at the same time. All these processes together would cause too high a cognitive load for the learner (Rummer, 1996). In order to lower the cognitive load for the learner, it is necessary to reduce the cognitive tasks which the learner has to deal with while

changing his or her behavior. In the case of speech receptive behavior these tasks are: remembering the utterance, explicating one's own analysis, revising and refining the analysis and comparing it with an expert's solutions. Only the relevant tasks should be "in the mind" of the learner. Less relevant tasks, like remembering the utterances or the own analysis, could be taken over by using software.

For the fostering of de-automation and reflection, computer programs can serve as cognitive tools (Jonassen, 1992; Mandl, Gruber, & Renkl, 1995) by supporting cognitive processing and sharing "the cognitive burden of carrying out an intellectual task" (Salomon, 1993, p. 182). By storing the learner's solutions, for example, the computer can relieve the learner of this cognitive burden of having to remember his/her solution and the learner thus can focus on reflecting his or her solution. This reflection can be supported by supplying the learner with the opportunity to compare his/her own solution with the solution of an expert. By supporting the reflection of one's own behavior, computer-supported learning environments can help to de-automate this behavior.

Software can also be employed when it comes to re-automation. Re-automation can be achieved by training and exercising the acquired or changed skills, a task for which computer programs have been used since their early days (Kremer & Sloane, 1998; Mandl, Gruber, & Renkl, 1995). Thus, computer programs can help the learner to carry out those activities which have been identified as central for changing communicative behavior. In the following chapter we will take a closer look at the possibilities and limitations of software programs for the training of communicative behavior.

Software for the training of communicative behavior?

We have seen that instructional reasons suggest the use of software to help in fostering more differentiated analyses of speech utterances . As discussed above, computer-supported learning environments can support the de- and re-automation of communicative behavior. Yet, for many learners it does not seem natural to foster communicative behavior and other soft skills with the help of computers. Just as other soft skills, communicative behavior is social by nature and is a part of human interaction. According to a situated view of learning, skills should be taught in the setting they are embedded in in everyday life or at least in settings which come as close as possible to the respective real-life context (Collins, Brown, & Newman, 1989; Greeno & The Middle School Mathematics Through Application Project Group, 1998; Law, 2000). Thus, communicative behavior should be fostered in the setting it is applied in: human interaction.

According to Barron (1998) the shortcomings of multimedia products for the training of soft skills lie in their inability to depict the complexity of social interaction. He hopes that these shortcomings can be overcome by the progress in technical development, which enables more complex simulations of social interactions as well as more interactivity for the learner. This might be true to some extent, but it seems doubtful if computer simulations will ever come close to the authenticity of real social settings in face-to-face trainings.

A different view regarding the use of software for the training of soft skills is the integration of the software into course settings. The advantages of both – classroom learning and computer-supported learning – can thus be combined. The trainer can focus on training social situations, face-to-face discussions, on exercises and on giving feedback to the contributions of the learners, whereas the software can be used to train and exercise the individual cognitive skills underlying the social competencies (Cohen & Rustad, 1998).

A growing number of authors state that the use of computer-supported learning environments makes most sense if these learning environments are integrated into curricula and combined with cooperative and other forms of learning (Glowalla & Häfele, 1997; Kerres, 2000). By carrying out time-consuming cognitive activities with the help of computer-supported learning environments, time can be gained for cooperative classroom activities (DeCorte, 1994, 1996). Kerres (2000) argues for the use of hybrid learning arrangements. This term “hybrid learning arrangements” stands for a combination of computer-supported learning environments and other forms of teaching and training. This combination should be designed on the basis of didactic concepts. According to his view, medial learning arrangements are meant to be part of didactic problem solutions. Reusser (1993) states that computer programs should be used in education “as supportive cognitive tools in the service of explicit pedagogical goals” (p. 145). The software should be designed on the basis of a cognitive analysis of the curricular tasks and processes involved. Schofield (1999) also stresses the importance of explicit educational goals to determine where and how the use of computers is likely to be most effective. Her claim is that “we need to think more carefully about exactly how computer use can change instruction and when and where such changes are most likely to promote valued outcomes” (p. 174). This means that software should not be used in an unreflected way but that it should be integrated as a tool in order to reach specific instructional goals.

To summarize, the authors quoted above demand that the integration of computer-supported learning environments into classroom settings and collaborative forms of learning should depend on an explicit cognitive analysis of the curricular tasks and instructional goals. This cognitive analysis includes a detailed description of the subject matter (van Merrienboer, 1997). The learning goals and, subsequently, the learning activities can be determined after classifying and describing the specific skills and types of knowledge relevant in the subject matter.

As we have learned above, an analysis of the learning goals in the domain of speech receptive behavior leads to the following results:
A computer-supported learning environment which is designed to foster speech receptive behavior has to support the **de-automation** of the behavior by ...

- supporting the learner in bringing his/her own behavior into consciousness
- supporting the reflection of the learner's behavior
- reducing the cognitive load caused by reflection.

The **re-automation** of communicative behavior can be supported by ...

- providing the learner with the opportunity to repeatedly exercise the changed or newly acquired behavior.

The complexity of communicative behavior and the social and interactive nature of communicative behavior can be taken into account by integrating the learning environment into face-to-face course settings. The following chapter will discuss the integration of our computer-supported learning environment CaiMan© into a face-to-face training of communicative behavior and describe it in closer detail.

Training speech receptive behavior with the aid of the computer-supported learning environment CaiMan©

Integrating CaiMan© into a communication training. Communicative behavior does not only consist of speech receptive processes, which are fostered with the help of the computer-supported learning environment CaiMan©, but also of speech productive processes (Hermann, 1992). In order to profit from the fostered speech receptive skills, the learners have to be able to employ these skills in social interactions – by reacting to the utterances they now are able to analyze in a more differentiated way. As shown above, the observable communicative behavior in social interactions is best trained in face-to-face settings. Due to this reason, the

learning sessions with the computer-supported learning environment CaiMan© are framed by two face-to-face training modules, each with a duration of two days. The schedule of the training is depicted in figure 1.

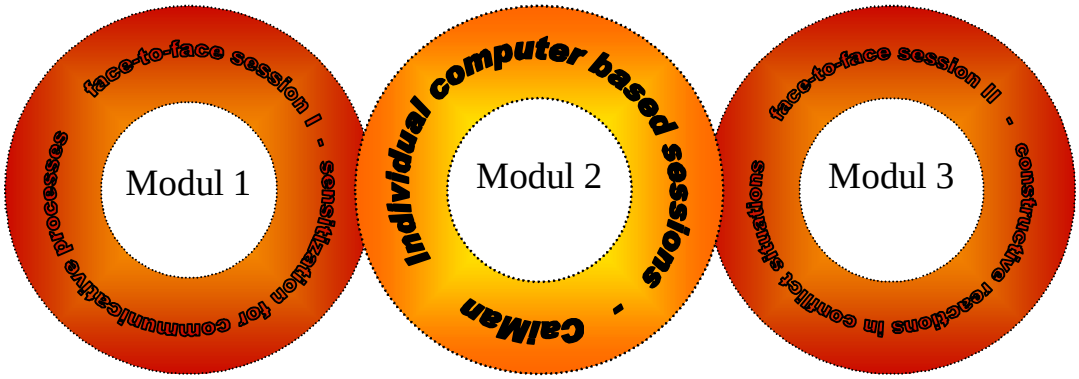

Figure 1: Schedule of the training

The first face-to-face group session aims at sensitizing the learners for communicative processes. With the help of various exercises, the learners consciously experience their own communicative behavior and reflect upon their performance. The last exercise of the first group session aims at demonstrating the difficulties and the problems that arise when analyzing and understanding the utterances of others, thus making the learning goal of the computer-supported learning environment CaiMan© apparent to the learners. After the first group session, the learners attend six individual learning sessions with the learning environment CaiMan©. In the second group session, the students learn and train how to react to the utterances of others in a constructive way. They learn how to react to utterances based on the differentiated analysis which they have learned with the help of the computer-supported learning environment CaiMan©. In the following paragraphs this learning environment will be described regarding its design criteria.

The use of multimedia for de-automation. As shown above, changing and fostering speech receptive behavior demands **de-automation** by bringing the own behavior into consciousness and reflecting it and **re-automation** by repeatedly exercising the new forms of behavior. Because all of this cannot be done while the learner is in the midst of a conversation, a computer-supported learning environment was designed to foster the ability to analyze conversational utterances.

Computer-supported learning environments allow the repeated use of video sequences and can help to reduce cognitive load: By writing down and documenting the analyses the learners do not have to memorize them and can still use them as a basis for their reflection.

Structuring the analysis of utterances. The computer-supported learning environment CaiMan© (depicted in figure 2) was developed to foster the ability to analyze conversational utterances in a differentiated way. The learners are asked to no longer analyze utterances in an unreflected way but to differentiate the aspects of an utterance according to the three functions of speech postulated by Karl Bühler (1934) – *appeal*, *expression* and *representation*. In using this model the subject asks himself/herself the following questions: "What does the speaker want the listener to do?" (*appeal*), "What does the speaker express about himself/herself?" (*expression*) and "About what objects or facts does the speaker inform the listener?" (*representation*). These three functions of speech can be found in every utterance. While learning with CaiMan©, the learners have to analyze utterances regarding each of the three functions.

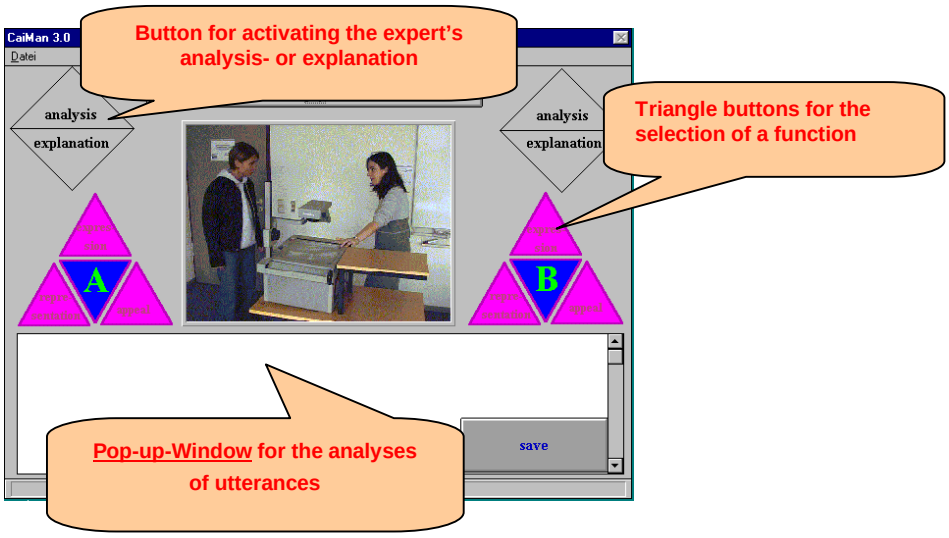

Figure 2: Screenshot of the computer-supported learning environment CaiMan©

The use of video sequences. Conversational utterances are part of dialogs. In dialogs information is not only transmitted by verbal speech but also by intonation and nonverbal behavior (Argyle, 1988; Foppa, 1994). In order to properly analyze utterances in dialogs, the learner needs to process the information which is trans

mitted verbally, nonverbally and by intonation. This information can be displayed with the help of video sequences. Another advantage of video sequences is that they can be displayed repeatedly. Watching a video sequence several times can help the learner to analyze the utterances.

Externalizing the analyses. The analyses need to be externalized and documented for them to be tangible for reflection. This can best be achieved by having the learners write down their analyses. Lammon et al. (1996) describe the advantages of having the learners write down their ideas and solutions: "...articulating ideas in writing encourages students to formulate their theories explicitly, it clearly facilitates memory, and it supports reflection and revision" (p. 249). The computer-supported learning environment CaiMan© enables the externalization and documentation of analyses by providing the learners with the opportunity of entering their analyses for each function of speech and recalling these analyses later.

Explaining the analyses. Verbalizing the analyses is only the first step of the de-automation of speech receptive behavior. The externalization of the analyses documents the final product but not the processes or the cues which were used to get to the analyses. The explanation of one's own behavior constitutes a central part of reflection (Henninger, Mandl, & Law, 2000; Law, Mandl, & Henninger, 1998). According to various authors the explanation of one's behavior or solutions provides the learners with a powerful opportunity for learning (Chi, 2000; Dominowski, 1998; Ericsson & Simon, 1998). Our learning environment supports the reflection of the analyses by requesting the learners to enter explanations for each of their analyses.

Instructional support by providing an expert's analyses and explanations. In order to give the learners an orientation for the reflection of their analyses, they are provided with the analyses and explanations of an expert for each function of speech. They can compare their own analyses with those of the expert. Thus, the expert provides a model of how conversational utterances can be analyzed (Bandura, 1971; Collins et al., 1989). By reflecting the expert's analyses and explanations the learner creates a mental model of how analyses and explanations might be done. Therefore, by providing the learners with the opportunity to verbalize and reflect their analyses of conversational utterances, the computer-supported learning environment CaiMan© constitutes a suitable tool for the de-automation of speech receptive behavior.

Re-Automation by repeated exercise. (Re-)Automation of skills is achieved by repeatedly exercising the skills (Hacker, 1998; Leontiev, 1981). This implies that the learning environment CaiMan© has to provide the learners with the opportunity to repeatedly practice the analyses of conversational utterances. In each session with the learning environment, the learners analyze two different video sequences depicting a dyadic conflict situation. In both sequences the learners have to analyze the utterances of both conversational partners. CaiMan© is applied during six sessions in each course. Thus, the learners undergo a number of learning cycles in which they practice the analysis of conversational utterances. This provides the learners with a basis for re-automating the analysis of conversational utterances.

Factors of success for the integration of software into the training of soft skills

The learning software CaiMan© has been integrated into trainings of communicative behavior for several years now. During all this time, it has been subject to educational and psychological research. Instructional and motivational factors were investigated in the studies dealing with CaiMan©. This research has shown that this learning software is successful in improving the differentiated analysis of conversational utterances and that it is highly accepted by the learners (Henninger, 1999; Henninger & Mandl, 1993, 2000; Henninger, Mandl, & Pommer, 1994; Henninger, Mandl, Pommer, & Linz, 1999). Seven factors can be identified which have been shown to be responsible for the success of the learning environment CaiMan©:

1) **Description of the subject matter:** The accurate description of the subject matter allows the definition of learning goals and the identification of the kind of knowledge and/or skills which need to be learned. The learning environment CaiMan© was designed on the basis of an explicit description of the subject matter. This description leads to the learning goal of a differentiated understanding of communicative utterances. Furthermore, the instructional design is affected by the description of the subject matter. The subject matter of speech reception requires the de- and re-automation of the skills which are to be fostered (Henninger, 1999; Henninger & Mandl, 2000).

2) **Software as a tool:** Software should not be used as an end in itself. Only the deliberated use of learning software in the service of instructional goals will lead to success (Kerres, 2000; Reusser, 1993; Schofield, 1999). The learners have to realize by themselves the necessity to use the software for learning. In our case the learning gains of the software CaiMan© connect the two face-to-face training

sessions and it is obvious for the learners that it is necessary to work with CaiMan© in order to succeed in the second face-to-face group session (Henninger & Mandl, 2000).

3) **Integration of software into a course setting:** The use of software makes most sense if it is integrated into conventional forms of learning and teaching (Kerres, 2000). This is especially the case with the training of soft skills because they consist of both individual cognitive skills and social interactive skills. The computer-supported learning environment CaiMan© is integrated into a face-to-face course setting. The fostering of speech productive and of speech receptive behavior thus can be combined. This is important because there is no conversational situation in everyday life which consists of only one of the two parts of communicative behavior.

4) **Authentic learning scenarios:** A basic assumption of situated learning approaches is the authenticity of the learning scenario (Collins et al., 1989; Greeno & The Middle School Mathematics Through Application Project Group, 1998; Law, 2000). The context of learning should be similar to the context in which the acquired knowledge and skills are used in everyday life. The computer-supported learning environment CaiMan© is embedded into an authentic learning scenario: The analysis of conversational utterances is conducted on the basis of realistic conversational situations. These scenarios are displayed by video sequences. The degree of authenticity of the integrated video sequences, however, did not have a positive impact on the learning results (Henninger et al., 1999).

5) **Easy to use:** One of the aims of learning software as a cognitive tool is to support the learner's reflection by reducing the cognitive load he/she is confronted with. This can only be the case if the use of the software itself is easy and comprehensible. The computer-supported learning environment CaiMan© is easy to use and does not offer more features than necessary.

6) **Obligatory participation:** The learner can only profit from software, if he/she uses it. Thus, we do not consider it helpful, if the use of learning environments is voluntary. Especially if the computer-supported learning environment is embedded into a course setting, it is necessary to establish the same or a similar level of knowledge in all the learners. Learning with CaiMan© is obligatory for the participants of the communication training. Several studies (Pommer, 2000; Linz, 2000) showed that the learning environment CaiMan© is successful in teaching a differentiated analysis of conversational utterances independent of the learners' motivation.

7) **Adaptability of the software:** No training is like another. In many cases, it is important to emphasize different contents and to adapt trainings to the situation of the clients. Thus, it is necessary for a computer-supported learning environment, which is integrated into such a training, to be adaptable to the special situation of every training. The computer-supported learning environment CaiMan© can be adapted to the knowledge and interests of the learner: The instructor has the possibility to integrate different video sequences into the learning environment and to switch on or off diverse instructional features – such as the request for the learner's explanations or the accessibility and content of the expert's analyses and explanations – just as desired.

To sum up, although the use of computer-supported learning environments for the training of soft skills might appear paradox at first sight, we could show in our studies that the integration of such software can be successful (Henninger, 1999; Henninger, Mandl, Pommer, & Linz, 1999; Pommer, 2000) We could identify seven factors which are responsible for this success. The drawback most often voiced by the learners is that they miss direct support and the possibility to discuss their analyses. Consequently, a further development of the computer-supported learning environment CaiMan© will focus on providing online-coaching via internet.

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