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# **Towards a Groupware Didactic - Experiences from the Training of Groupware in Cuparla**

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## **Abstract**

The adoption of groupware in organizations is the result both of targetted organizational and technical interventions and the spontaneous and unplanned appropriation moves of the users. Training ist the core of a groupware (organizational) implementation. Here the targetted actions of the implementors and the unplanned appropriation by users meet and the resulting contradictions need to be resolved.

This paper summarizes the learning process of the groupware trainers during the implementation of the Cuparla groupware in the Stuttgart and Kornwestheim City councils. There are roughly three phases: In the first phase – we call it the "just do it" approach, trainers tried to train groupware like single user software. This approach failed, because it failed to communicate the collaborative nature of groupware. Groupware simply did not make sense to the users after the first training and the did not use it. Afterwards both the software was changed and the training was tailored to groupware. We came up with a macro structure training software functionality in the following order: 1. information features 2. communication features 3. colloboration and coordination features. The rationale behind this order is increasing the dependency on others: A single user can already benefit from information provided by the administration; E-mail already requires others to also use the computer as a communication medium. However, the dependency is both straightforward and simple. Cooperation (i.e. sharing documents) and coordination (e.g. using a group calendar) requires the co-use of others and the interdependency between users can be quite complex. Moving from the simple to the complex allowed us to build up a critical mass that made the groupware application beneficial to all users.

We also developed a micro structure for a groupware didactic. It involves the embedding of real cooperative council activities into the training, the heavy use of metaphors, the role of the trainer as a moderator of collaborative activities and a tight link between the trainers and the software developers. The implementation left us with a lot of experiences in groupware implementation, but we did not have a framework to tie the results together. Therefore we are currently working on a groupware didactic. A promising basis for such a groupware didactic is the Theme-Centric-Interaction (TCI). Recently, TCI has become quite popular in moderation and group communication training. TCI explicitly gives the group and the group interaction a place in training. However, as TCI is neither a computer didactic nor does it tackle important issues of organizational implementation, it needs to be combined with other approaches to develop a comprehensive computer didactic.

## 1 Introduction

The introduction of Groupware is balanced between targeted organisational and technical intervention by implementers [Walsham 1997] and by the users' spontaneous and unplanned adaptation of technology during the course of its usage. The key to the introduction is the training of the users, because here you have the coming together of targeted intervention and unplanned spontaneous adaptation of technology. The resulting contradiction has to be solved in such a way that co-operation is possible in subsequent day-to-day work.

In this paper we are going to explain the whole learning process which the trainers carried out at the introduction of Groupware in Stuttgart and Kornwestheim City Councils. We will look at three different phases of this work: phase 1 - we tried to introduce Groupware by just doing it as was normal for the introduction of individual software in public service. This method didn't work. Phase 2 was the „learning by doing“-method. The trainers (some of them fully qualified IT-trainers) developed their own methods during the introductory course by consideration and reflection without bothering about a deeper didactic basis. In Phase 3 we experience a more intensive period of reflection. We consider which didactic concepts can be offered to trainers to make the introduction of Groupware easier for them. For this purpose the concept of Theme Centred Interaction [Cohn 1992] proved useful.

This contribution was consciously thought up as a topic for discussion. We believe that a framework must not only be able to describe the stages of introduction (e. g. the Adaptive Structuration Theory), but that it should also give directions for Groupware design. Then you can not do the introduction without training and therefore you can not do training without a didactic basis. Before we start to describe our experiences and ideas gained in these three phases we wish first to make you acquainted with the Cuparla Project.

## 2 Cuparla - Computer Supported Parliamentary Work

In the autumn of 1995 the Cuparla Project (Computer Supported Parliamentary Work) was begun under contract to Deutsche Telekom Berkom GmbH. The Chair of Wirtschaftsinformatik at the University of Hohenheim lead a consortium consisting of the Datenzentrale Baden-Württemberg and the Information-Technologiemanagement-Beratungsgesellschaft. Cuparla had the following aims:

- to enable the City Council to work more efficiently and more flexibly
- to create improved and fast access to information for City Councillors
- to reduce communication barriers within the City Councils and
- between the City Council and the administration
- as well as to improve the possibilities for co-ordination and co-operation.

From the end of 1995 until Spring 1998 Lotus-Notes based Groupware was introduced into the Stuttgart and Kornwestheim City Councils and has been in use ever since. In the first three months the work of the City Councils was analysed using the Needs Driven Approach Method (NDA) [Schwabe & Krcmar 1996] and the need for support was recognised. It was obvious that City Councils (at least in large cities) certainly need support for their work, because of

- the intensity of their work in the areas of information, co-operation and co-ordination

- the stress caused by their strict, full timetable
- the necessity to fulfill many activities at home in the evenings and at week-ends.

The results of the analysis (including time sheets of the City Councillors) were the starting point for the configuration of hardware and the development of a special City Council Groupware package based on Lotus-Notes in the Summer and Autumn of 1996. City Council work, supported by Cuparla, can be divided up into the following scenarios:

1. Any time and different places: Cuparla permits co-operation between City Councillors, political parties and the administration regardless of time or place. This is done by email, electronic black boards and shared document data bases.
2. Same time and same place: Meeting Support Systems using GroupSystems [Lewe & Krcmar 1992].

As well as the organisational and technical introduction, it was necessary to develop a user orientated concept for the introduction and training of Groupware. A special challenge had to be met during the introduction of Groupware because of the demands and the character of the City Councillors. The City Council is a very heterogeneous area, due to the following points:

1. The age structure of the Councillors: The average age of the Councillors is 50 since the oldest Councillor is over 70 and the youngest only 26.
2. Computer knowledge: Two thirds of the Council members have never used a PC nor have they had any contact with one.
3. Professional background: This varies from a lady doctor to a lawyer and right down to a bank clerk and a lady scientific assistant.
4. Attitude towards a PC: This varied between positive and negative.
5. Gender: Men and women.
6. Stress caused by an overloaded timetable.

### **3 Phase 1: Just do it!**

A one-day introductory training session took place in June 1996 for the first users within the pilot scheme. This group of users was made up of computer skilled Councillors and one inexperienced lady Councillor. Skilled standard software trainers were in charge.

It was planned to include in the training the use of notebooks and knowledge of LotusNotes, because LotusNotes formed the basis of the software. The method was to be the explanation of the individual functions of the software in association with the City Council's day-to-day work. A general LotusNotes manual was to be the training manual.

During the training the software was described by the trainer using the computer screen. He explained the make-up of the screen, the meaning of individual icons and pull-down menus as well as their functions. While he was explaining this, he was all the time basing his explanations on the question: What happens when I click onto this icon? His method was to demonstrate one step and then instruct the pupils to copy this on their computer.

In the course of the training it became apparent, that many Councillors could not follow the instructions and the project members present were forced to help them. This was especially so with test exercises where the

pupils were obviously quite lost. This may have been for the following reasons:

1. The Councillors couldn't link these explanations using the make-up of the screen with their Council work. A link-up with their existing knowledge was therefore not possible.
2. This method of demonstration and copy has the disadvantage that the pupil doesn't have to work out the make-up of the screen for himself but only bothers to keep up with the trainer and not to get lost.
3. The trainer didn't pave the way for the transfer of the material they have learned to the real work of a City Council. This had to be done by the Councillors by themselves. Only a few succeeded in completing the test exercises for the individual icons and functions could not be transferred into concrete experience.
4. The complexity of LotusNotes is such that it is too complicated for laymen so that
5. more time is needed to practise.
6. The idea of co-operation by computer was not recognised by the Councillors because the training had built up the illusion of an individual stand-alone software.

The general training manual which is purely about LotusNotes was too detailed for the training. In addition it confused the pupils. The missing connection with their work in the Council was an additional problem for them. According to the pupils the range and length of training was too long.

As the result of this training the software that was on offer was not used: instead of this they continued to use the individual software MS Office. This necessitated a restructuring of the training as well as the redesigning of the make-up of the screen.

## **4 Phase-2: Learning By Doing**

Based on the experience gained in the first phase:

1. the development of software was closely linked to the training so that difficulties and problems caused by the Councillors led directly to suitable changes in the Cuparla Software. In this way training was established as a link between development and use.
2. In this way training was understood to be an important instrument within the introduction.

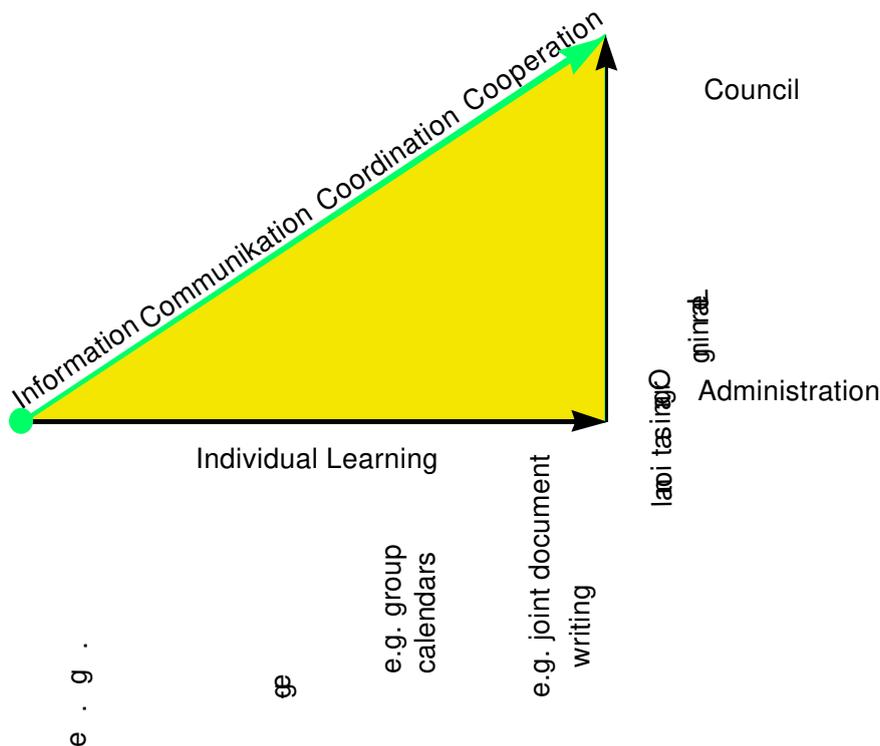
In addition the structure and the course of training was corrected for subsequent occasions:

- The software was explained by means of metaphors relating to daily Council work. The starting point for training was to be the real world and therefore using the different rooms in which the Councillors work.
- Each training session gave the council members knowledge that they could immediately use in their council work.
- Explanations and the presentation of the complete procedures within a task were first given by the trainer. Then the Councillors attempted to imitate these and thereafter the resulting questions were discussed.
- The training manual was rewritten based on the real work of the Councillors and regarded more as a means of reference.
- It was planned in the future to hold training sessions lasting 2 to 5 hours on weekdays and at the week-end.
- Training sessions in the MS-Office were held by training personnel (independent from the project) organised by the City Administration.

Each training showed that the explanations based on metaphors provided the Councillors with links between

their real world and the stuff they had learned. And yet they often could not remember it and had to be trained again. What was the reason behind this? Councillors carry out their Council work in different ways. For instance it was not usual for everyone to write proposals themselves or to work them out together with their colleagues. Even the research and exchange of information was done to a different extent and manner. Therefore the structure and the possibilities for using the Cuparla-System were not obvious to them, even when these were quite clearly presented. It could then be seen that co-operation between the Councillors within the parties varied greatly. For example there was one party where almost nothing was worked out together. Therefore the idea of tele-co-operation was incomprehensible to them. This proved that it would be necessary to work out rules and schemes for its use for individual groups within the Council i.e. political parties (see similar [Pankoke-Babatz 1998]). For example, that minutes and papers at the electronic meeting place for political parties are only meant for the next party meeting.

A further problem was to obtain enough users and information to meet the required numbers and amounts for its acceptance. Again Councillors were very quickly demotivated if their colleagues did not answer their emails and they then stopped using this media themselves. This resulted in the creation of a special arrangement of the procedures in the introduction. First of all this gave individuals the incentive for personnel usage of the notebook independent from others and then the following stages of the introduction increased the dependence upon others using it. The result of this can be seen below.



**Figure 1: Steps of groupware introduction (aus [Schwabe 1998, S. 479])**

The first step was to present possibilities for individual usage, especially the research into information but also the writing and printing of texts and documents. The second step was communication where we

practised writing and sending emails. The third step consisted of the presentation of possibilities for co-operation and co-ordination such as a shared appointments diary and the production of shared documents.

It became increasingly clear during the course of the training that the trainer had increasingly to change his understanding of his role as a trainer and adopt that of a counsellor and facilitator for co-operation. The problem still remained for them to "unlearn" their old habits and to learn and accept new working methods.

The following incentives were offered to the Councillors to encourage them to accept the software and to attend training sessions:

1. Each session should enable them to gain something from its usage.
2. There was a certain competitiveness among the Councillors with regard to council work which grew due to the improved accessibility of information [Schwabe&Krcmar 1998].
3. An artificially competitive situation was created in puncto use of notebooks where for example mobile phones or personal digital assistants were only made available to power users.

Different methods of training and start-up points for the trainer's explanations still remained a critical point within the training sessions. Not all trainers had understood the „spirit“ of the Cuparla software. Therefore the manner in which its use was recommended and the way it was explained differed from trainer to trainer. Often the user became confused since they could not relate to the explanations or else they found them to be contradictory.

The manner of training changed from imparting knowledge during initial one-day-sessions into 2 to 3 hour workshops. The training method mutated into a user-orientated facilitatory method. The content of a workshop was determined by the pupils who brought along their problems, requests, and difficulties, to be worked out together.

## **5 Phase-3: Didactic Concept for Trainers**

The way of training and the way it was carried out was fully developed during the second phase. In the course of the project the trainers had become experts in the introduction of Groupware in Stuttgart and Kornwestheim City Councils. Indeed, it is to be assumed that this training experience described above will also be useful for the introduction of Groupware to other City Councils. However, without further reflection and abstraction of this experience no general didactic concept can be developed which would be suitable for a trainer. We will consider this in phase-3. The starting point for this will be the so-called „Theme-centred Interaction“ (TCI).

Theme-centred Interaction is a concept created for groups and developed by Ruth Cohn. This concept allows an active, creative, and exploratory teaching and learning so-called „Living-Learning“ (see [Sielert 1994, S. 409]). It is based on the experience and knowledge gained from psycho-analysis, humanistic psychology as well as therapy. Two aspects lent their names to this concept. On the one hand groups assemble with a definite theme, on the other hand they work this out interactively. In addition the personal feelings of the individual (I), of the group (We) and their surroundings (Globe) are taken into consideration. The aim is to be aware of people in their entirety, their interactive actions, the theme and the Globe as equals and to treat them as such. TCI creates structures in the group process to achieve a dynamic balance between the

varying needs of the individual, the interaction of the group and the tasks (I-We-It-balance) and the given surroundings (Globe) in both the narrowest and broadest sense.

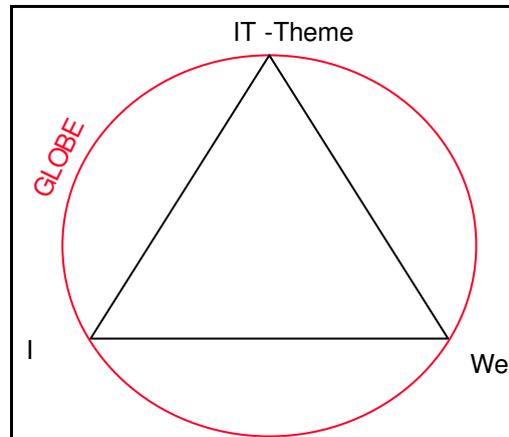


Figure-2: TCI-triangle

TCI is made up of generally accepted principals (axioms), initial premises (postulates), methods and auxiliary rules as the theoretical basis and practical procedures during training sessions i.e. Groupwork. The axioms form the basis. The other elements were developed for its establishment. Thus, the whole is a complete concept on several levels.

Why has TCI be chosen as a starting point for a Groupware didactic? In didactics for adult education and computer didactics [Döring, Klaus W. (1990), Gerbig, Christoph; Gerbig-Calcagni, Irene (1998); Meier, Rolf (1990); Schröder-Naef, Regula (1999)] the pupils are treated as individuals, the aim (intention), theme, content, media, teaching methods, background and role of the trainer are all considered. They do not consider the group (We), their relationship to one another nor the way in which they co-operate with each other. Since a Groupware System does not aim to support individuals in a group but only to support co-operation within the group (see fig. 1), in our view the general didactic therefore lacks an important element.

**Result 1: Within the introductory training of Groupware it is recommended that the elements of the adult didactic should be combined with those of TCI in order to take equal account of the individual, the group, the theme, and the globe.**

Therefore we will explain how TCI can be used to plan and carry out Groupware training. The value of TCI lies in the simplicity of its structure which is manageable and easy to communicate.

## 5.2 Planning

How can Groupware training be planned with the help of TCI?

The TCI-Triangle can assist the trainer to analyse the circumstances. Firstly, he should work out for himself the following steps.

- Theme (It): the tele-co-operation system together with its „spirit“ [DeSanctis&Poole 1994], its possibilities

and limits

- We: the style of the co-operation within the group
- I: the individual as a single unit

as well as the relationship between the elements.

By carrying out these steps all the trainers will gain enough knowledge necessary for the training session and the individual trainer will avoid working out the theme merely within his own limited training unit. Should all trainers not be able to work out the first step for themselves because of lack of time, then they should at least be able to get the result to plan their training units.

The following table shows how the TCI-triangle (see fig. 2) can be used as an instrument for analysis and planning. This table shows first of all the corners e.g. „We“, then the links between the corners and finally the relation to the surroundings (globe).

<b>We</b>	Analysis of interactions and co-operation (Formation of the whole group? The atmosphere within the group? How does the group interact? Does the group co-operate? And how does the group co-operate?)
<b>I</b>	Analysis of the targeted group (e.g. What is the personal background of the individuals?)
<b>It (Theme)</b>	What are the components of the tele-co-operation system? Which tasks can be supported by it? What are its limits? Where are the opportunities? What are the possibilities for creativity offered to the group by the tele-co-operation system?
<b>I - We</b>	The position of the individual within the group? Hierarchical order within the group?
<b>I - It (Theme)</b>	Which convictions/methods of work/places of work does the individual have relative to the theme? Which working tools and materials do they use? What is the logical sequence of the subordinate themes?
<b>Globe</b>	What is the framework? Which rules apply?
<b>Globe - It (Theme)</b>	How is the tele-co-operation system embedded in the Globe (other IT-Systems, interfaces,...)? What are the relative points?
<b>Globe - I - (It) Theme - We</b>	How does the Globe influence Me-Theme-Group? What limitations and possibilities result from the Globe?
<b>Globe - Me</b>	What is the position of the individual within the Globe? What connections and relationships arise?
<b>Globe - We</b>	What is the position of the group within the Globe? What connections and relationships arise?

By carrying out the analysis the trainer gains insight and understanding into the structures, the interdependency and the points for possible alterations in all the above areas.

**Result 2: TCI used as an instrument for analysis grants the trainer knowledge and cognisance for his macro- and micro-didactic.**

The next step includes the analysis of the contents (How can the theme be organised? What connections are there between the subordinate themes? Where are the interdependent links between the subordinate themes?... ) and the didactic reduction (Which of the contents can be dealt with quickly? What are the definite needs of the individual or the group?) to crystallise the different training units.

If the trainer observes the corners and sides of the TCI triangle closely while putting the learning sequence together it will be obvious whether the learning sequence makes sense in the intended order or not. For

example: if it is found that the Councillors are not co-operating, then a further teaching unit headed „Working Together“ must be placed before the teaching unit headed „Working Together with the Tele-Co-operation System“ so that the group realises where they can co-operate.

From looking at It (Theme)-We it will become clear whether commitments on co-operation must be made during the training units. For example: if the Councillors learn to work with emails, then it is only sensible that they should communicate in this way in the future. To make things clear the group can immediately agree on what occasions in the future emails will be used by everyone.

**Result 3: The TCI-triangle helps the trainer to recognise interdependent subordinate themes and therefore to decide upon the sequence of the training units and their content and form.**

The TCI-triangle can again be used to plan the individual training units in order to examine the different subordinate themes found in relation to the We, I and the Globe.

<b>It (Theme)</b>	What are the contents of the teaching unit? How does it relate to other units? Which knowledge/skills/abilities are required to work on the theme and which have to be acquired?
<b>I</b>	Which members of the targeted group will attend the training unit? Which characteristics/attitudes/opinions/wishes/needs do they bring along?
<b>We</b>	What is the make-up of the participating group? Are they all members of the targeted group or only a part? Which characteristics/ attitudes/ opinions/ wishes/ needs do they bring along?
<b>I - We</b>	Position of the individual within the group? Hierarchical order within the group?
<b>I - (It) Theme</b>	Which convictions/methods of work/places of work does the individual have relative to the theme? What is new for the individual? How can he gain by using it? How does the training influence/alter the convictions/methods of work/places of work for the individual?
<b>We - (It) Theme</b>	Which convictions/methods of work/places of work does the group have relative to the theme? What is new for the group? How can they gain by using it? How does the training influence/alter the convictions/methods of work/places of work for the group? What consequences does this have for the group?
<b>I - (It) Theme - We</b>	Will the position of the individual in the group be changed by the training? Will the individual's way of working change within the group?
<b>Globe</b>	What limitations/framework are given? How does the Globe influence I, It (Theme), We? What limitations and possibilities are offered by the Globe? What influence does the I-It-We have on the Globe?
<b>Globe - (It) Theme</b>	Whereabouts is the theme within the whole? What relative points are there between the whole system and the theme of the single training unit?
<b>Globe - I - (It) Theme - We</b>	How does the Globe influence I-It-We? What limitations and possibilities are offered by the Globe?
<b>Globe - I</b>	Where does the individual stand in the Globe? What connections and relationships arise?
<b>Globe - We</b>	Where does the group stand in the Globe? What connections and relationships arise?

If several trainers work together they will recognise from the analysis of the Globe - Theme where their single training unit belongs in the whole. The individual trainer will avoid teaching his subordinate theme merely from

the point of view of his own limited training unit.

**Result 4: The TCI-triangle helps the trainer to be aware of his and the training unit's position and to recognise from which point of view he should make his explanations.**

The TCI-triangle can again be used when choosing the different training methods, media, and materials as well as formulating the aims. For example, when formulating the aims: Will the aim be too much for the individual? Will it be too much for the group? How much influence will the aim exert on the theme (It)? Does the framework fit the aim? Or, for example, choice of media: Does the media fit the theme (e.g. use of the computer as an extra teaching tool)? Is the media suitable for the group? Can the individual also work with it?

**Result5: The TCI-triangle supports the trainer as he works out the Didactic Elements (training methods and techniques, media/materials/tools, aims).**

## 5.2 Teaching

How can a trainer carry out Groupware training using TCI?

Active co-operation is right at the centre of tele-co-operation. This is not considered in traditional Computer-/IT-Didactics since teaching the individual using individual software makes up their main aim. This deficiency is covered in TCI by its postulates, methods and auxiliary rules. While teaching using TCI, co-operation becomes highly active. Not only the existing ways of co-operation are transferred to the new Groupware system but there is a demand for new participative, balanced co-operation. The pupil learns to be more carefully perceptive of himself as well as of other members of the group. This is also useful with regard to the difficulties of changing the old ways of co-operation. With this new self-perception changes in behaviour and in procedures are accepted more quickly. TCI also makes its contribution to the build-up of trust. For, by using the postulates, methods, and auxiliary rules a franker atmosphere is created thus encouraging and increasing trust and confidence. These are important factors when using Groupware. If a user doesn't trust his colleague he will not work with him, for example, in producing shared documents.

By taking into consideration the whole entirety, these aspects are also strengthened.

The trainer's aim should not be to deliver maximum knowledge in the shortest possible time: this defeats the object [Cohn, Ruth C. [1992, p. 167]]. Gaining knowledge has to be linked to character development and therefore to the widening of factual-, self- and social competence and to link them up with their daily life.

**Result6: TCI balances I-We-It and therefore supports co-operation.**

If the trainer takes on board the postulates, methods, and auxiliary rules, he mutates into a counsellor using a participant-orientated, participative style of teaching. Since active, facilitative Living-Learning was crystallised in the second phase as a requirement for teaching, TCI offers the chance of support and further development all in one. Existing didactics contribute only by method to this. They do not include any possible character-development of the trainer.

TCI supports the trainer's intuition and helps him to work out and be conscious of events, reactions etc.

during the training session.

**Result7: The trainer receives support from TCI in becoming a facilitative teacher and in sharpening his intuition.**

### 5.3 Limitations of TCI

In the introduction of Groupware, TCI alone is not enough to be the central factor for Computer Didactics.

1. TCI is a concept for running groups. The organisational background is not dealt with explicitly (except in the general meaning of globe). For example, nobody receives an idea from the TCI-triangle regarding the problem of the critical number of users needed [see Schwabe (1998, p.215ff)]. In this instance the trainer is advised to bring along his own experience and knowledge of this and to use it while planning his training units.
2. The use of the TCI-triangle at all levels is often found to be too time-consuming so that it is not readily acceptable for use.
3. Questions on the different corners and sides of the TCI-triangle do not occur to the trainer because of his lack of experience in the realms of IT and co-operation. A combination of Needs Driven Approach (NDA, a co-operation analysis) and TCI is recommended.
4. In practise it is often difficult to obtain background information on We and therefore the planning of the training sequence and the different training units either stands or falls.
5. A humanitarian education is the highest aim within the teaching systems. One of the subordinate aims is the reduction of rivalry and competition in favour of co-operation and collaboration [Cohn, Ruth C. (1992), p.176]. At first sight this contradicts the important role of competition within the group as an incentive for its use. At second glance it is, however, clear that competition and co-operation need not necessarily be antagonists but that they can work together in a productive way as long as some profit results from it.

TCI can be regarded as an important part for Groupware Didactics, because of its obvious potential, especially for the trainer, and also for pupils. Further supplements, for example, Computer Didactics and general cognisance, have to be added to make it suitable for Groupware introduction.

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