

# SEMINARS

## A Pedagogical Pattern Language on how to teach seminars effectively

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### Why and for who did we write this pattern language

This pattern language is intended for those instructors in the industry, who are not studied educators. We wrote it especially for those, who feel that something is going wrong with their seminars – perhaps they are even frustrated and don't know what to change or what the reasons could be. This pattern language gives some hints how the situation can be improved, i.e. how you can run better seminars.

After each seminar, whether successful or not, a teacher do some kind of debrief, asking himself (or herself) the following question: „Did the seminar run as I expected it?“ Try to find out about the reasons why it went this way. The following bullets might help if it was not as good as expected:

- External Factors that are out of my control, such as daily condition of the participants or the teacher, or an unplanned change of the room, a construction site in front of the window creating loud noise, etc. What could I have done to react flexibly to such a situation?
- I think they did not understand the topics. I had the impression that my talking did not reach them. Was it because the seminar was overly complicated for the participants, were the participants less qualified than I expected, or were they simply not interested?
- The participants were bored all the time, they did not ask questions, and they did not collaborate. Didn't I manage to present the topics in an interesting and easily understandable way?

On the other hand, if the seminar was good, you also should try to find out why and use the successful techniques again in the upcoming seminars. Once again, some points that might help:

- Was it good because the participants were extraordinarily interested and motivated?
- Was it a small group that facilitated effective teaching?
- Was it simply the good atmosphere in the group?

In general, teaching is about flexibility. Every teacher should have a set of techniques how he personally can run a good seminar. A teacher should collect these effective techniques over time, perhaps creating his or her own personal pattern language.

This pattern language gives some proven techniques for running a good seminar. For professional educators, these things might appear trivial, for the typical industry instructor, some of them might not.

However, there are no „magic techniques“. That’s why this pattern language does not give recipes that say „Do this, and everything is fine!“. It only hints at proven techniques and describes them as a pattern language. For experts in the field, this language might not provide much new information.

To apply the pattern language, every reader must decide for himself if a pattern is useful in his particular situation. It is important that you create a homogenous seminar. The participants should not think „Oh, look, now he’s trying to use pattern XY!“. Be sure that you, the teacher, are honest and that you do not try to do things you don’t like or that don’t suit to you.

In addition to describing the patterns themselves, the pattern language also tries to explain some of the biological, anthropologic and pedagogic background. It covers all aspects of a seminar from preparation till exams.

## Introduction to Patterns and Pattern Languages

As mentioned above, this pattern language is intended for instructors in the industry. They will probably not be familiar with patterns and pattern languages. That’s why we include a small sections on this topic. If you are familiar with patterns and pattern languages you can skip this section.

The first pattern language was a called „A Pattern Language - Towns, Buidlings, Constructions“ and was published in 1977 by the architect Christopher Alexander et. al. [CA+77]. He defines a pattern as follows:

*Each pattern describes a problem that occurs over and over again in our environment, and then describes the core of the solution to that problem, in such a way that you can use this solution a million times over, without ever doing it the same way twice.*

That means, patterns are not recipes that say „Do X, and everything is fine!“. They provide hints along which lines a proven solution can be found to the problem, ideally with advantages, disadvantages and consequences of using the solution.

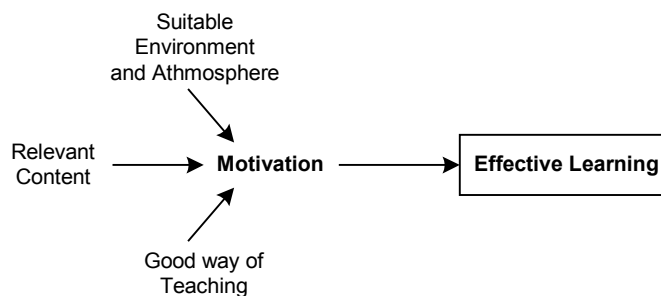
In his book, he introduces 253 patterns in the architecture domain. He presents patterns for everything from designing independent regions, to cities, to buildings and even to designing single rooms. By connecting these patterns with common forces and other relations he transforms this collection of patterns to a pattern language. It provides a consistent way to create a comfortable environment for people to live in.

At the beginning of the nineties the software community started using Alexander’s technique to capture and communicate expert knowledge in software development. The movement started in universities and on the major programming conferences, such as OOPSLA. The first book that was publicly available was „Design Patterns“ by Gamma, Helm, Johnson, and Vlissides called the Gang of Four (GoF). It was published in 1994, and they presented a catalog of 23 patterns on how to design software systems. In the meantime, domain specific patterns and pattern languages have been created, and the pattern movement has its own set of conferences, namely the PLOP, EuroPLOP, ChiliPLOP and KoalaPLOP (PLOP stands for Pattern Languages of Programming). Many of the patterns presented at these conferences can be found in [PLOP1, PLOP2, PLOP3, PLOP4]

In the more recent past the scope of the pattern languages expanded once again, now including patterns of group working, designing software in groups, and pedagogic patterns, that deal with the problem of how to teach (especially IT topics). This pattern language is intended as another addition to the pedagogic pattern movement, which can be found on the internet at [PP].

## Prerequisites

People are the central focus of teaching. Therefore, the patterns have to deal with biological and social basics that cannot be ignored. Taking these basics into account results in motivated participants, which in turn leads to successful learning. This section highlights some of them.

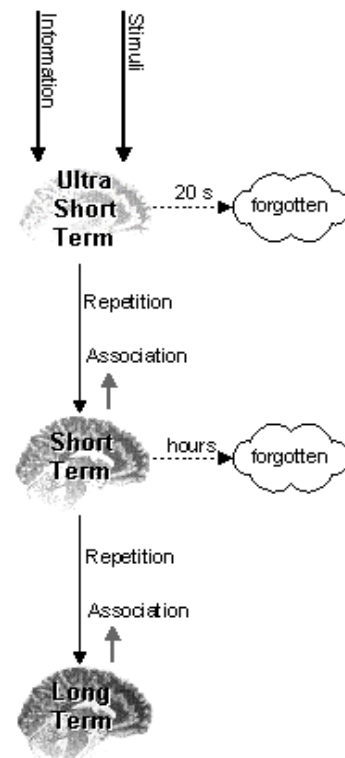


## Biological fundamentals

The human being is a result of thousands of years of evolution. Although ignored by modern society, there are still some aspects in a human being, that result from the time when we were animals, primarily following our basic instincts instead of thinking and planning as we usually do today.

One of these instincts is „fight or flight“. That means, a creature runs away if it feels uncomfortable, stressed, or even threatened. Experiences during such a situation are not considered worth learning and are forgotten by the brain, thus not allowing the animal to override its instincts with possibly fatal thoughts. Mapping this behaviour to humans means, that people have to feel comfortable if they want to learn. This includes their physical environment as well as the social well-being during a seminar.

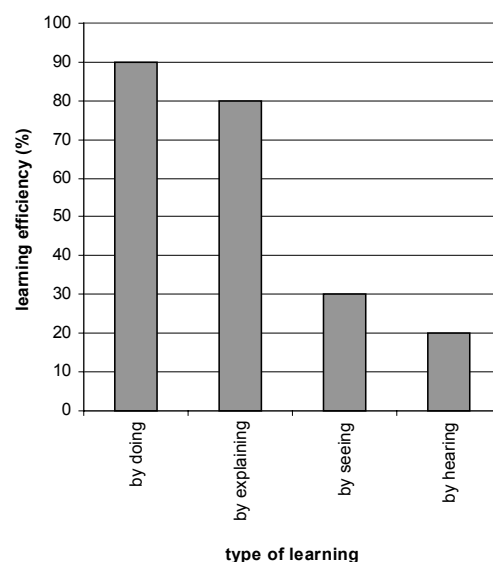
Another biological fact you cannot ignore is the way our brain works, in particular how it stores and remembers information. The brain is divided into three sections, receiving information in order. The first stage is the ultra-short term memory. It receives every information or stimulus from all the organs in the body. It can remember things for 10 to 20 seconds. In the literature [FV] it is often described as a kind of oscillation that abates after 10 to 20 seconds. During this time, the information has to be transported to the short term memory, where it can be stored for a couple of



hours. The transfer from ultra-short term to short term memory takes place, if the particular piece of information is either repeated, or if it can be associated with other information available in the brain – otherwise the information is irretrievably lost. This way, the ultra-short term brain serves as a filter that reduces the huge amount of information reaching the brain. The third stage is the long term brain. As you know, it can store information forever, some of them unconsciously. Information is transferred to the long term brain, if the brain thinks, it is worth storing it for a long time. Information or techniques that are repeated again and again over a long period of time or can be associated with other information in the long term brain are transferred to this part of the brain. Consequence: repetition and association to other topics is absolutely essential in teaching.

There is another interesting information that relates to how people learn. As the following diagram shows, the learning efficiency depends on the way the people deal with the contents.

The diagram shows, that the participants should work on a topic on their own or explain the topic to somebody else. Just watching or listening to the teacher is significantly less efficient. „Learning by doing“ is the most effective way of teaching. However, this diagram shows the average. Specific people might have different efficiencies.



It is also important that you plan your schedule in accordance with the daily rhythm of humans. Late afternoon and directly after lunch are times, when people are generally less capable. Including breaks and arranging the topics in a suitable way is important.

## Social fundamentals

The social basis for our pattern language is mutual respect among the teacher and the participants and among the participants. Every single person is accepted as a human with equal rights and equals duties. This means that everybody sticks to the basic rules of politeness. For example, everybody lets another persons finish what he/she wants to say before he or she starts talking. The opinion of the other participants and the teacher are respected. If the teacher tries to explain something, the participants are quiet. They don't just leave the room whenever they would like to.

On the other hand, the teacher does not try to be an authority, regarding the participants as subordinates. He respects their opinion and qualification. He tries to teach the contents as effectively as possible and cares about „his“ participants by including breaks, etc.

During a seminar, especially during longer ones, the group of participants and teacher(s) has to merely live together. They form a group. This group should work well, i.e. people should trust each other and be honest. However, everybody should accept the minimum social distance that other persons might need. Don't be obtrusive.

In general, the atmosphere is at least as important as the methodical and technical content. The seminar should be held in a good atmosphere, humour is important and the teacher should be relaxed, honest and competent.

You should also keep in mind, that for some participants, the seminar is a way to escape from everyday business live. You should respect this, and not try to overstrain the participants.

## The Pattern Language

### Pattern Form

The patterns in this pattern language use a form similar to the one used by Alexander. All patterns are written in the you-form, thus directly talking to you, the teacher. In addition to the pattern name, each pattern is divided into three sections. The first section describes the problem and the forces (bold font). The second section (below the \*\*\*) outlines the solution to the described problem as well as the consequences, limitations and disadvantages. The third section provides examples and additional information (italic font). References to other patterns in this language are highlighted by using CAPITAL LETTERS.

#### 1. PATTERN NAME

##### Problem Description

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Solution outline,  
consequences, drawbacks

*Exaples and additional  
information*

### Structure

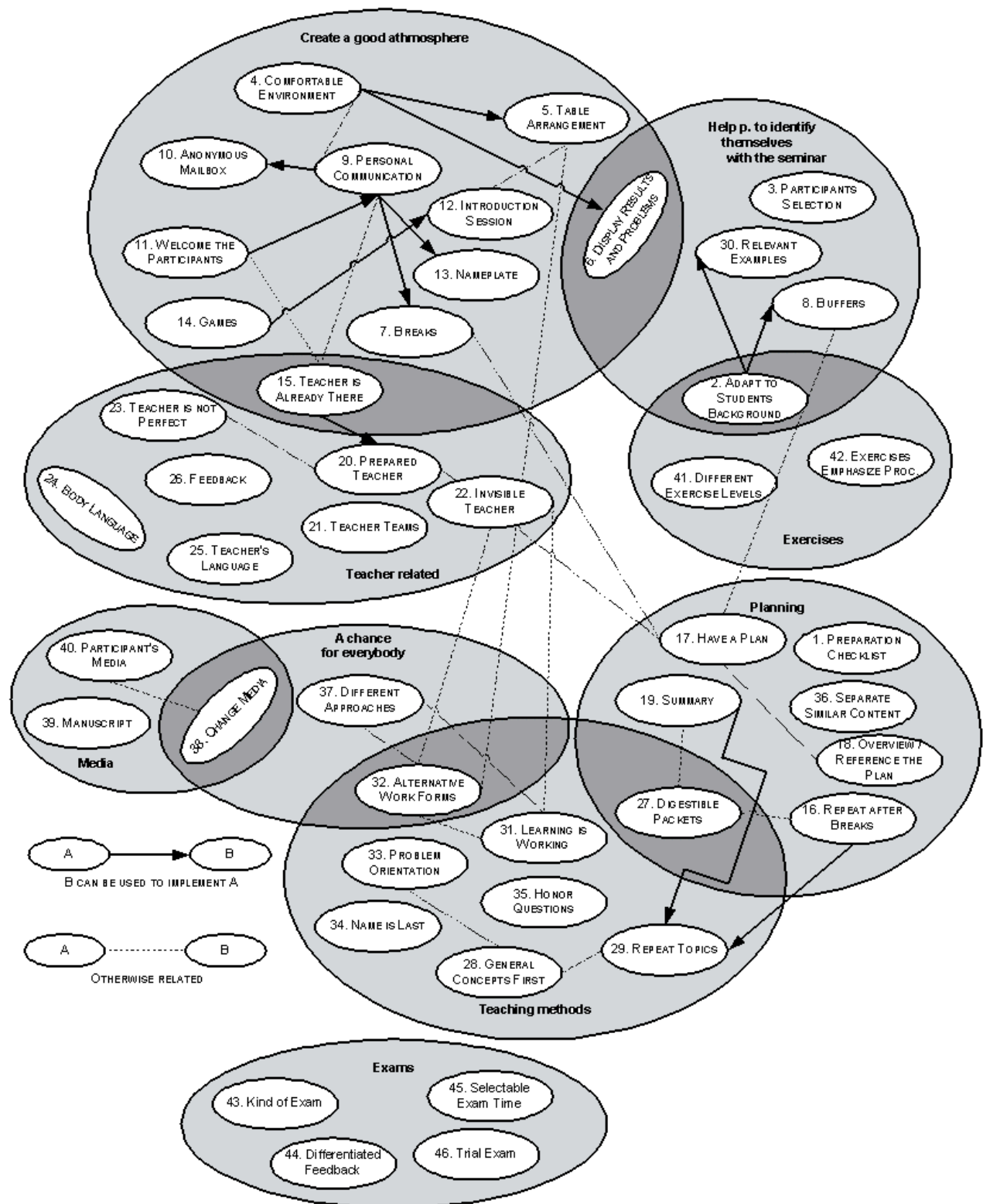
This section organizes the patterns regarding different aspects to form the actual pattern language.

The first aspect is temporal. Running a seminar consists of several phases. The following illustration provides an overview of the phases, their temporal order and the patterns that can be used during these phases.

Temporal ordering of the patterns

Preparing the Seminar	The seminar begins	The sessions	The Teacher	Teaching	Exams
1. PREPARATION CHECKLIST 2. ADAPT TO PARTICIPANTS' BACKGROUND 3. PARTICIPANT SELECTION 4. COMFORTABLE ENVIRONMENT 5. TABLE ARRANGEMENT 6. DISPLAY RESULTS AND PROBLEMS 7. BREAKS 8. BUFFERS 9. PERSONAL COMMUNICATION 10. ANONYMOUS MAILBOX	11. WELCOME THE PARTICIPANTS 12. INTRODUCTION SESSION 13. NAMEPLATE 14. GAMES	15. TEACHER IS ALREADY THERE 16. REPEAT AFTER BREAKS 17. HAVE A PLAN 18. OVERVIEW / REFERENCE THE PLAN 19. SUMMARY	20. PREPARED TEACHER 21. TEACHER TEAMS 22. INVISIBLE TEACHER 23. TEACHER IS NOT PERFECT 24. BODY LANGUAGE 25. TEACHER'S LANGUAGE 26. FEEDBACK	27. DIGESTIBLE PACKETS 28. GENERAL CONCEPTS FIRST 29. REPEAT TOPICS 30. RELEVANT EXAMPLES 31. LEARNING IS WORKING 32. ALTERNATIVE WORK FORMS 33. PROBLEM ORIENTATION 34. NAME IS LAST 35. HONOR QUESTIONS 36. SEPARATE SIMILAR CONTENT 37. DIFFERENT APPROACHES 38. CHANGE MEDIA 39. MANUSCRIPT 40. PARTICIPANT'S MEDIA 41. DIFFERENT EXERCISE LEVELS 42. EXERCISES EMPHASIZE PROCESS	43. KIND OF EXAM 44. DIFFERENTIATED FEEDBACK 45. SELECTABLE EXAM TIME 46. TRIAL EXAM

It is also possible to consider another aspect: The problem it intends to provide a solution to. Of course, each pattern solves its own specific problem, that's why there are separate patterns. But the problems can be generalized and grouped, resulting in the next illustration. In addition, some patterns can be used as a way to implement another pattern, thus resulting in a „can be used to implement“-relation among the patterns.



## Quick Access Table

The following table lists some typical problems and names the patterns in this language that can be used to address these problems.

<b>After the seminar, people say they didn't understand the topics.</b>	DIGESTIBLE PACKETS, GENERAL CONCEPTS FIRST, LEARNING IS WORKING, SEPARATE SIMILAR CONTENT, DIFFERENT APPROACHES, REPEAT AFTER BREAKS
<b>Participants say, they don't know how to apply the newly learned topics to their own domains.</b>	ADAPT TO PARTICIPANTS' BACKGROUND, RELEVANT EXAMPLES, BUFFERS, PARTICIPANT SELECTION
<b>People are bored during the seminar.</b>	ADAPT TO PARTICIPANTS' BACKGROUND, RELEVANT EXAMPLES, LEARNING IS WORKING, ALTERNATIVE WORK FORMS, CHANGE MEDIA, FEEDBACK, INVISIBLE TEACHER
<b>The participants say, the seminar was too stressful.</b>	BREAKS , PARTICIPANT'S MEDIA, COMFORTABLE ENVIRONMENT
<b>The participants leave the room often during the seminar.</b>	BREAKS
<b>Participants ask questions about topics that will be taught later.</b>	HAVE A PLAN, OVERVIEW / REFERENCE THE PLAN, DISPLAY RESULTS AND PROBLEMS
<b>The atmosphere is very sterile.</b>	DISPLAY RESULTS AND PROBLEMS, COMFORTABLE ENVIRONMENT, TABLE ARRANGEMENT, PERSONAL COMMUNICATION, GAMES, NAMEPLATE, BODY LANGUAGE, TEACHER'S LANGUAGE, TEACHER IS NOT PERFECT, TEACHER IS ALREADY THERE
<b>My sessions are boring, I don't feel I can fascinate the participants.</b>	CHANGE MEDIA, BODY LANGUAGE, PROBLEM ORIENTATION, RELEVANT EXAMPLES, ADAPT TO PARTICIPANTS' BACKGROUND, OVERVIEW / REFERENCE THE PLAN
<b>The participants are afraid of the exams.</b>	KIND OF EXAM, SELECTABLE EXAM TIME, HONOR QUESTIONS, TEACHER IS NOT PERFECT
<b>The participants don't want to do exercises.</b>	EXERCISES EMPHASIZE PROCESS, DIFFERENT EXERCISE LEVELS
<b>I don't know whether the problems are on my side or on the participants side.</b>	TEACHER TEAMS, ANONYMOUS MAILBOX, PERSONAL COMMUNICATION



<b>The participants don't ask questions during the sessions.</b>	HONOR QUESTIONS, ADAPT TO PARTICIPANTS' BACKGROUND, TEACHER IS NOT PERFECT
<b>I talk and show transparencies all day long, and I think the participants are not able to follow me. Other possibilities?</b>	LEARNING IS WORKING, ALTERNATIVE WORK FORMS, CHANGE MEDIA, MANUSCRIPT
<b>I feel I don't get in touch with the participants.</b>	PERSONAL COMMUNICATION, BREAKS, INTRODUCTION SESSION, WELCOME THE PARTICIPANTS, NAMEPLATE, GAMES, TEACHER IS NOT PERFECT
<b>I feel the participants cannot get the big picture, they don't see context.</b>	OVERVIEW / REFERENCE THE PLAN, SUMMARY, PROBLEM ORIENTATION, GENERAL CONCEPTS FIRST
<b>They don't know how to prepare the exam.</b>	EXAMPLES, TRIAL EXAM

## The Patterns

### 1. PREPARATION CHECKLIST

**Before beginning a seminar, it must be thoroughly prepared. You should be aware of how skilled the participants are, which contents you want to teach, how you want to teach these contents, etc. You should know the environment in which you are going to teach the seminar.**

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Therefore, use a preparation checklist that contains all the necessary elements that have to be prepared before you start to plan the seminar in detail.

*Examples for the contents of such a checklist might be the following:*

- *What is the background / domain of the participants?*
- *What is the overall content the session should teach?*
- *Is there a concrete goal you want to reach with the session?*
- *What materials and media are available for this topic?*
- *How many participants will be in the seminar?*
- *Which is the best way to teach the contents? This depends very much on the participants!*
- *You should inspect the room, and check about the table arrangement, the available media types, etc*

## 2. ADAPT TO PARTICIPANTS BACKGROUND

**The participants should feel that the seminar is relevant to their problems. When the seminar is over, they should have learned something they can use in their day-to-day work. It is important that they never lose this feeling during the seminar, because it is directly related to the participants' motivation.**

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Therefore, assure that in general, the contents of the seminar are as near as possible to the participants' background or domain. Avoid the use of examples from domains with which the participants are unfamiliar. If all participants are from the same company or from companies in the same domain, use examples and wordings from this domain. If the participants work in different domains, try to use well-known domains in your examples (such as banking, vehicles, persons...).

Of course, this imposes more work on you, the teacher, because you have to learn the intricacies of a perhaps foreign domain. But this is a lot better than forcing the participants to learn your domain, in addition to the seminar's core contents. If you think it is too much work to get into the participants' domain, you should consider not teaching the seminar.

Using this pattern results in a much more effective seminar, because the participants can ask relevant, realistic questions, and they can see directly how the newly learned topics help them in their everyday work.

*Use RELEVANT EXAMPLES or exercises from the participants' domain. Try to use the participants' wording. E.g. teach a tool with the help of a realistic project from their domain or even company. We know of a guy who teaches project management to employees of a company that manufactures hydroturbines. He told us that since he uses real turbine projects in his seminars (he knows them because he has done quite a lot of these seminars), the participants are much more satisfied with the seminars.*

## 3. PARTICIPANTS SELECTION

**You should always try to run a seminar in a way that suits to the participants. This is true for the contents, as well as for the schedule and the methodology. It is not always easy to find out about the preferences of the participants.**

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Therefore, involve the participants in the planning of the seminar, or at least, give them some alternatives to choose from at the beginning of the seminar. The participants will feel better and the seminar will be more relevant to them, because they were involved in the decision what will be the content of the seminar.

*For example, you could ask them how often they want to include breaks, which examples they want to do (selection from a set of possible examples), or you could ask them whether they would prefer a more active involvement (exercises, group work) or whether they would like you to do a more presentation-style seminar.*

## 4. COMFORTABLE ENVIRONMENT

**The environment in which the sessions take place should support the learning process. Learning is only possible in an environment where a person feels well. In a situation where a person feels stressed or otherwise uncomfortable, our brain blocks learning (see introduction).**

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Therefore, the seminar should be held in a comfortable environment that facilitates learning. That does not mean that you have to create a living room atmosphere. But the room should be large enough, it should be painted in friendly colors, it should be quiet, etc. Of course, often it is not possible to modify the room until it suits your needs, but it is still possible to make it somewhat better.

*Some ways to improve the atmosphere in a classroom without renovating it could be the following: it is important that the room is tidied up, there should be only those things in the room that are relevant to the seminar. A wardrobe for the participants to put their jacket and bags is also a good idea. A very important aspect of the comfortable environment is TABLE ARRANGEMENT (see below).*

*During the seminar, work results and other related information could be attached to the wall, thereby making the room a part of the seminar (DISPLAY RESULTS AND PROBLEMS) . Cork strips can be attached to the walls of the seminar room to facilitate this.*

*If you are building a new classroom try to find a room with many and big windows, because daylight is better for work than artificial lighting. If you need lighting regularly, be sure not to use neon lamps because they create a very artificial kind of light, use pleasant lighting. Consider placing some planting in the room. Don't make the room look like a hospital by using white walls, white tables, etc. Use wooden or other friendly interior, and add curtains to the windows. Also take care of the infrastructure. Make sure that there are enough power outlets, also for the students. The same is true for LAN plug sockets, if computers should be used. A good projection surface for the overhead projector or beamer is also important, it should be large enough that the contents can be read from the back of the room.*

*It is also a good idea to add shelves for related books and material. Don't use cupboards to lock the books away. Make them available to the participants.*

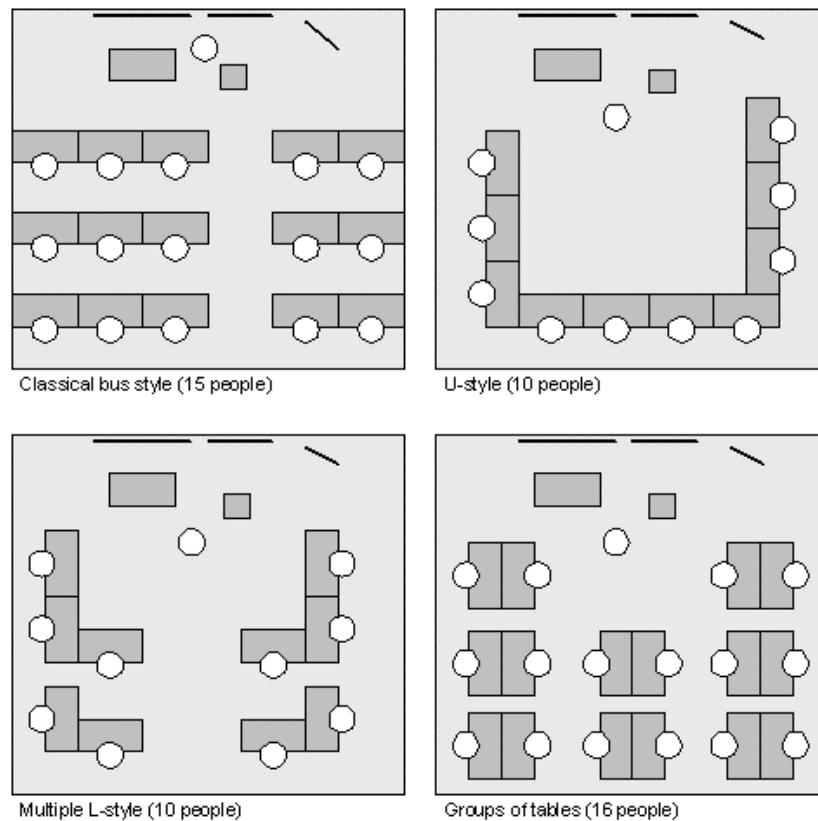
## 5. TABLE ARRANGEMENT

**A very important aspect of the COMFORTABLE ENVIRONMENT is the arrangement of the tables in the classroom. Selecting a suitable arrangement of the tables depending on the methodology used (see ALTERNATIVE WORK FORMS) can have a significant effect on the overall success of the seminar. Arrangement of tables can also have significant practical consequences.**

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Therefore, arrange tables in a way that makes the group of participants feel well from a social point of view. Ideally, everybody should be able to look everybody else in the eye. Another aspect of choosing the arrangement of the tables is the presentation style used during the session (for details, see examples). Depending on the type of presentation, different arrangements of tables should be selected.

Be sure to respect the minimum spacial and social distance that everybody needs. Otherwise the situation might be considered obtrusive and as a consequence, people won't feel comfortable.



Of course, rearranging the tables might not be possible in a classroom where a significant infrastructure is installed, such as computers and networks. Some of the possible arrangements are quite wasteful regarding space, and might therefore be impractical.

There are different possible table arrangements. The most generally usable one is the U-Form, where people sit on the outside, looking inward. It can be used if a presentational style is used by the teacher, because everybody can look to the front. It is also well suited for discussions and collaborative work, because everybody can look everybody in the eye (including you, the teacher). This arrangement has the additional advantage that you can easily walk to every participant. A last point is, that it is not possible for some participants to sit in the last row, or: those who arrive last do not have to sit in the unpopular first row. The U-Form has the disadvantage that it wastes a lot of space.

Rearranging the tables during a seminar or even a session can be a good relief. People have to move and it can be good fun (see GAMES). During such rearrangement people have to talk to each other, making a good possibility for PERSONAL COMMUNICATION.

*For pure presentations, the traditional bus style can be used: people sit in rows, everybody looking forward. This arrangement uses the available space very effectively. The most significant drawback is that people cannot look other people in the eyes, discussions and other forms of collaborative work are difficult. In addition, it is hard for you to walk to the participants, because usually the rows are quite narrow (and filled with bags, coats, etc).*

*For pure discussions it might make sense to sit in a circle using only chairs and no tables at all. This creates a more informal setting and can break psychological barriers. The U-Form is a quite good approximation of a circle and can often be used alternatively.*

*For group work, arranging the tables in groups is most suitable. A good compromise for presentation style and group work is the Multiple-L-Form. People are naturally grouped and can still look to the front.*

## 6. DISPLAY RESULTS AND PROBLEMS

**A kind of „we-feeling“ should arise during the seminar. The participants should be able to identify themselves with the seminar. They should see that the seminar produces usable and visible results. Everybody should be aware of work products and open points.**

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Therefore, make results and problems visible and obvious to all participants by using lists, posters, etc.. Every participant should be allowed to add open points or work products (in a structured way). Everybody can write down important topics and problems. As a consequence, participants will be able to recognize what the group has achieved, and which points are still open. Questions don't have to be asked again and again, and the participants can see that the questions are not forgotten. Using this pattern can help build a COMFORTABLE ENVIRONMENT.

*Put the problems and achieved results on a poster on the wall for everybody to see. A pinnwand (does anybody know the english word???) can be used to collect questions and open points. If it is not possible to „decorate the room“ this way, use sheets of paper that can be edited by everybody and keep them in a publicly accessible place. Copy these papers for everybody on a daily basis. Modern technologies like the WWW, news and email offer additional possibilities.*



## 7. BREAKS

**The brain can only concentrate on a topic for a limited period of time. After this period, the participants are not able to understand anything anymore. Often, this is the reason why participants leave the room during sessions. This creates an atmosphere of noise and hectic.**

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Therefore, include sufficient breaks. Even five minutes of fresh air during a session can help significantly. The breaks should be included at regular intervals in each session. You should try to stick to the planned break times. If it is unsuitable to make a break at the planned time, tell the participants about it and ask them to continue for another five or ten minutes. This shows that you didn't forget the break. Breaks also help to improve the quality of the group by providing room for PERSONAL COMMUNICATION.

*Include many, possibly small breaks. People can go to smoke, have a little talk, go to the toilet or just go to the window and breathe fresh air. Try to keep the breaks short, and try to keep them in the schedule. Be sure that they are long enough that people have realistic chance to go to the toilet or smoke a cigarette without returning late! During these breaks, coffee and other drinks*

*(tea, juices) could be served. You should consider planning more breaks in the afternoon, because in the afternoon people are usually more tired than in the morning. Longer breaks for (second) breakfast and lunch should be included, of course.*

*During my time at the university, the sessions were usually 90 minutes. One professor included a 5 minute break after 45 minutes. This enabled the participants to walk around and breathe fresh air, allowing them to stay awake for the second half of the chemistry lessons.*

## 8. BUFFERS

**During a course, unforeseen problems and topics will arise, the participants might have important questions, etc. You should be able to incorporate these additional topics into the course, at least to some extent. This helps to ADAPT (THE SEMINAR) TO THE PARTICIPANTS BACKGROUND.**

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Therefore, create your timetable/schedule with these unforeseen time requirements in mind. Create buffer times. You should not ask the participants to „add an extra hour/day“ to include an additional topic or to answer a participant’s question, because they might have planned their time differently. Because such unforeseen topics will always arise, it is safe to incorporate these time buffers from the beginning. However, be sure not to drift too far away, you should stick to the seminar’s planned content.

*The schedule can explicitly contain periods marked as buffers, or, alternatively, some parts of the content could be marked as „optional“, these parts can then be replaced by one of the unplanned problems. Sometimes the unplanned topic is similar to a planned example; consider replacing the example with the unplanned topic.*

*During a seminar on Design Patterns, we had enough time to discuss patterns in the context in the participants’ company’s product (which is written in their own OO language, making the discussion even more interesting). This had a very positive effect on the overall success of the seminar.*

## 9. PERSONAL COMMUNICATION

**Also in the course of the seminar, it is important that the participants have time to talk to each other informally. This is especially true if they work in the same domain and come from different companies, they will want to talk shop with each other. If you don’t give them the time explicitly, they will do it during the sessions.**

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Therefore, create spare times where all participants are together in an informal setting. These spare times should not be filled with seminar content. It is important that the teacher is also present during these spare times, but not playing the teacher’s role, he should be „on the same level“ as the participants. The teacher should avoid doing other things during



this time, such as organizing the next sessions or making additional copies. It is also important that during these times the teacher avoids talking about the seminar or about topics from the seminar. This is also the time when problems among the participants or between teacher and participants can be solved. To facilitate personal communication be sure to use NAMEPLATE.

*The group could go to lunch together or visit a pub in the evening. The COMFORTABLE ENVIRONMENT can offer small tables, where people can stand, drink coffee and talk to each other. This pattern is especially important if the teacher has worked (or works) in the same domain or even company as the participants before he started teaching seminars. It is important that there are times where the distinction between teacher and participant becomes less important.*

## **10. ANONYMOUS MAILBOX**

**There are people who are not able to solve problems by talking freely with each other or the teacher. You should still give these people a chance to communicate their concerns. And sometimes, real problems have risen in the group that cannot be solved just by talking while having a cup of coffee.**

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Therefore, create an official way for participants to communicate to you anonymously. Important information might be communicated to the teacher via this path that would otherwise not reach the teacher. If the group works well, PERSONAL COMMUNICATION will suffice to solve problems. If this pattern gets used heavily, this indicates that there are serious problems within the group or in the relationship participants/teacher.

*An example for this pattern pattern might be a real mailbox somewhere in the class room where participants can put notes. Email and web technology offers other possibilities, of course. At the end of the seminar, offer feedback forms that can be filled by the participants anonymously. Of course, if the groups works well, PERSONAL COMMUNICATION can help to avoid problems that make this pattern necessary.*

## **11. WELCOME THE PARTICIPANTS**

**The beginning of a seminar is one of the most important phases. It is at that time when social contacts are created or blocked. It is a perfect time for the first informal talks.**

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Therefore, welcome the participants. You should be already there when the participants arrive. You should talk to them informally. When the participants arrive, they should not be left standing around somewhere, not knowing who's the teacher, who are the other participants, and who is just accidentally around. If a suitable atmosphere is created, the participants will get in touch with each other and the group starts to form. This makes room for PERSONAL COMMUNICATION among the participants and with you. However, it is important that you are not obtrusive, you have to keep each person's minimum distance.

*You could show them the room, perhaps introduce them to the other participants, etc. You could place tables in front of the classroom, offer coffee (and other drinks, because not everybody likes coffee!). Ask the participants about their professional background and their expectations*

*towards the seminar. The participants feel that their opinion is important. However, be sure not to drift away into private contents.*

## **12. INTRODUCTION SESSION**

**Once again, it is important that the participants form a harmonious group. To make this a reality, the participants need to know each other and the teacher, at least from a professional point of view.**

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Therefore, take the time at the beginning of the seminar to let everybody introduce him-/herself to the others. The participants should be given a chance to state their expectations towards the seminar and tell the others about their professional background, their company, etc. This session should be held in an informal context, which can be achieved by using a suitable TABLE ARRANGEMENT. It is also possible to use GAMES at the beginning of such a session. To make a start, you should begin the session by introducing yourself. Be sure to introduce yourself, not the seminar.

*There are different ways how this introduction session can be held. The most common form is that everybody introduces himself to the others, including his name, employer, his field of activity, etc. In general, the contents depend heavily on the clientele (imaging the difference between programmers and pedagogists). It is a good idea to let the participants decide what they want to include in their introduction. An alternative form is to let one person interview another person and introduce this other person to the group. The introduction session usually ends with everybody attaching a NAMEPLATE to himself.*

## **13. NAMEPLATE**

**If you want to create a good atmosphere and facilitate personal communication, you should give the participants and the teacher a way to call everybody else by name.**

\*\*\*

Therefore, be sure that everybody wears a nameplate on his shirt, so that everybody's name is present all the time. Nameplates on the table are not so well suited, because during breaks and other informal times where the names are most important, they are not available. Be sure to find a consensus whether to use first or last names.

*An ideal and simple way to create nameplates is to use Tesa Krepp and write the name on it with a thick pen.*

## **14. GAMES**

**At the beginning of a course, an atmosphere of trust must be created among the participants. Productive work is only possible in a harmonious group. Between sessions the participants should really relax and, ideally, move!**

\*\*\*

Therefore, consider playing games in the group. The games should emphasize achieving things together. Games that aim at distinguishing winners and losers are not suitable. You have to decide if games are suitable to the participants. Games improve group quality, and they are usually not very demanding, from an intellectual point of view, serving as a good way to relax. However, games can be dangerous if the participants



don't like them or consider them childish or otherwise useless. Never use games if the participants don't want it.

*The positive effects of playing games in a group can be observed at the EuroPLOP conferences. A dedicated person (George) is there who just organizes and coordinates games. Real mature people play them, and this is one of the reasons why the EuroPLOP is so special. It is reported that games are also successfully used in some management seminars.*



## 15. TEACHER IS ALREADY THERE

**It does not make a very good impression if the teacher drops into the classroom two minutes after the session should have begun, and quickly prepares his "show" while saying hello to the participants.**

\*\*\*

Therefore, the teacher should be there well before the participants arrive, so he has time to prepare the stage. He can then WELCOME THE PARTICIPANTS, as they arrive. The participants have the impression that the teacher considers the course important. When the participants arrive, they have time to talk to you and ask short questions (PERSONAL COMMUNICATION).

*You should prepare all necessary materials, prepare all the necessary transparencies in the correct order, clean the blackboard, etc. Be sure to use this pattern in conjunction with PREPARED TEACHER.*

## 16. REPEAT AFTER BREAKS

**The teacher often forgets that the participants do not learn the topics as quickly as he explains them. Especially after a break, the participants have to be brought back in line. The teacher has to give the participants a chance to find their way back to where they were left before the break.**

\*\*\*

Therefore, after a break, repeat the topics that were covered before the break. Focus on the important aspects, don't get lost in details. The participants can distinguish the important information from the more unimportant things. Take these times into account when you create the schedule.

*There are different methods how this repetition can be achieved. Either the teacher simply repeats the important topics, or he quickly revisits the important transparencies, etc. In a well-working group it is even better if one of the participants repeats the important topics perhaps by using the teacher's transparencies.*

*As always, it is best if the participants are active instead of passive. In this context that means, that the repetition can be achieved by letting every participant write down the important topics on a paper on his own, or by discussing the important topics with his neighbour. To simplify such a discussion, you can prepare cards with important topics.*

## 17. HAVE A PLAN

**You should try to follow a systematic approach teaching the contents in your seminar and in each of the sessions. It is not desirable to admit things like „Oh, what I forgot last session when we were talking about XY....“.**

\*\*\*

Therefore, create a plan, or an agenda. Create one for the whole seminar and for each session. It should contain the contents, a schedule including breaks, etc. Try to stick to the plan. Be sure to have a look at BREAKS and BUFFERS while you create the plan! If the atmosphere gets bad or if people try to disturb the session, be flexible to diverge from the plan. This plan is a more detailed version of the the PREPARATION CHECKLIST.

*A good plan also contains a lot of experience and requires experience to create. So be sure to adapt the plan from seminar to seminar, to incorporate your new experience. During a seminar you should continuously check whether the plan is still current and whether you are still in the schedule. If not, the plan has to be adapted. Doing this regularly means, that you can adapt it in a sensible way, and not just leave away the last chapter, because time gets short at the end.*

## 18. OVERVIEW / REFERENCE THE PLAN

**The participants should always know where in the overall agenda the seminar currently is. Usually it is clear from a temporal point of view (everybody knows the time and everybody knows, how long the seminar is going to last). From a contents point of view it not always as obvious, but it is very important. The participants should never be surprised and they should be able to embed the current topics into a greater context.**

\*\*\*

Therefore begin each session with an overview. Tell the participants quickly what will be covered in the current session and show them on the plan where in the overall context the seminar currently is. For this pattern to work, you need to HAVE A PLAN.

*As always, there are different possibilities. You could show the table of contents, and show where the course is currently, or you could just tell what's going to come. Another alternative is to put up the table of contents on the wall, and always have a pointer pointing at the current topic. If there is not too much content in a seminar, you could add a simplified version of the TOC on each transparency, highlighting the current section. Be sure to use short names for each section, so that they can easily be referenced. REPEAT AFTER BREAKS is also a good way to REFERENCE THE PLAN.*

## 19. SUMMARY

**The participants should leave after a session (or a seminar day) with a feeling of accomplishment. They should be sure that they have learned something (useful) and they should know exactly what they have learned and what they can do with that knowledge. Sometimes these things get drowned in the details that have been discussed in a seminar.**

\*\*\*

Therefore, at the end of each day, provide a summary session which repeats the important topics that have been discussed in the sessions. Set these topics into relations with things learned during other session and perhaps show a final example that makes use of the contents of the session/day. Be sure to repeat only the essential topics and

emphasize the greater scope. In addition, give an outlook of what will come next, and show them, how the learned things fit together with the future topics. To make the pattern work effectively, use DIGESTIBLE PACKETS. If the seminar lasts for several days, ask the participants at the end of the first day, if the seminar is like they expect it to be, and eventually, take corrective action.

*It is not important that you once again tell the participants what you have told already three times during the day! The important aspect is, that they are confronted with the important topics once again. That means, that this summary session can also be „implemented“ by letting them do an additional exercise, discussing with their neighbors, writing a small summary, etc.*

## 20. PREPARED TEACHER

**It is very important that the participants feel that the teacher takes the seminar seriously. The teacher is the person who should send out an aura of rest. Every action should be avoided that creates anxiety. The course of a session is disturbed if the teacher has to leave the room for some reason. Especially in the early sessions of a seminar it leaves a bad impression!**

\*\*\*

Therefore, the teacher should be prepared! This especially means, that the sessions can proceed without the teacher leaving the room, looking for transparencies, etc. Once again it is important that you HAVE A PLAN for a session, otherwise you cannot prepare! A good MANUSCRIPT can simplify the preparation significantly, i.e. a good MANUSCRIPT is a good preparation.

*Some of the aspects that should be prepared are media (it is very embarrassing if the teacher mumbles something like „Last time the transparency was there, ....“. The scripts should be available in adequate numbers. The overhead projector should work, flip chart pens should be available, the teacher should know how to darken the room, etc. It is a good idea to create a checklist for this purpose!*

## 21. TEACHER TEAMS

**Teaching is not easy and it can be a lot of work. It is especially hard for a teacher to find out about his personal weak points. It is hard to find problems (and their reasons) in your own sessions. If a teacher is very unproductive with a class, he might not realize what the problems are.**

\*\*\*

Therefore, join up in teams with fellow teachers. You can occasionally sit into each others sessions and criticize him and talk about his problems after the session. In addition, teacher teams can prepare seminars together, they can share materials, examples etc.

*Other colleagues might already have taught a seminar you have to do now, and they know about problems, time consumption for certain topics, etc. They probably have examples you can reuse in your seminar. Of course, they won't give you these things for free, they will probably want to have materials from you as a compensation, so be sure not to become a cadger. For some very sophisticated examples that require special domain knowledge, you could even invite a colleague to hold a session for you...*

## 22. INVISIBLE TEACHER

**In a seminar, the most important people are the participants, not the teacher. The participants learn most effectively when they work on their own, passive listening or reading while following the teacher's show is not as good.**

\*\*\*

Your job as a teacher is to help the participants for learn themselves. So the best teaching method is not to teach at all, but to let the participants work on the content on their own. You should offer the participants help whenever they have problems. Sometimes teacher presentations are necessary, but you should keep the „show“ part of your sessions to a minimum.

It is also important that you do not show off with your skill. The participants do not attend a seminar to learn how skilled their teacher is, but to learn as much of the content as possible (with as few work and as much fun as possible). This „show off“ problem is especially critical with very skilled teachers, gurus. A guru in a certain domain is not necessarily the best teacher, there is more to good teaching than good domain knowledge.

*This pattern has consequences on how sessions are organized (see ALTERNATIVE WORK FORMS). The active part of a teacher should be minimized by utilizing group work, exercises, discussions, etc.*

## 23. TEACHER IS NOT PERFECT

**Nobody is perfect. This is also true for teachers. This is even true for teachers regarding the contents they teach. If you try to seem perfect, nobody will believe it. If you try to seem perfect, you will have a problem if you cannot answer a question.**

\*\*\*

Therefore, do not try to be perfect. In particular, if you cannot answer a question, admit it! Tell the participants that you don't know the answer. Tell them that you'll look it up for them, or explicitly ask the fellow participants whether one of them can answer the question. You can also try to work out the solution together with the participants. Be sure not to create the impression, that the question is overly difficult, and that everybody who tries to answer it cannot possibly know it because you, the teacher do not know it, otherwise, nobody will answer such questions!

However, if it happens to often, you should think about whether you are a PREPARED TEACHER, or not. A teacher who tries to be perfect is not very credible. Try to be honest.

*You should avoid searching you transparencies / books, mumbling things like „I'll find it in a moment...“ unless you really know it is there. Often such „searches“ are used to think about a more or less acceptable answer, although the teacher definitively does not know it.*

## 24. BODY LANGUAGE

**70% of the overall information is taken up via the body language of the teacher. The body language can either support or contradict the spoken word. During the communication process, the body language always overrides the spoken word, i.e. the use (or not use) of this non verbal form of communication can significantly affect the whole teaching process.**

\*\*\*

Therefore, you should support the spoken word with the help of your body language. Gestures and facial expressions should be used intentionally.

*You should try to look the participants in the eyes, so they feel spoken to and integrated. In addition, you as the teacher get feedback about the participants condition. You should look at everybody in turn. If you use a too detailed MANUSCRIPT, there is a big risk of not looking at the participants, because you have to read the manuscript.*



*You should try to balance your movement in the room between the two extremes „Pillar in the room“ and „Tiger in the Cage“. Hectically walking around is as negative as standing around without a move or hiding behind your desk.*

*You should always try to show your full front and try to display open gestures with your hands and your arms. Never sit down or otherwise hide behind the desk.*

## 25. TEACHER'S LANGUAGE

**In addition to the technical contents, one of the most important aspects of good teaching is the medium with which the contents are transported – namely the teacher's language.**

\*\*\*

Therefore, you should use a language that suits the participants, being expressive and fascinating at the same time. Your voice should resemble the suspense that should prevail in the participants.

*Use short, simple sentences. Technical termini should only be used if they are well known. Use a verbal style. Speak slowly and insert breaks to give the listeners a chance to process complicated facts. Accentuate important topics by changing your voice, by varying your talking rate or by repeating them. Speak loud enough and don't use too much dialect.*

## 26. FEEDBACK

**During the sessions, it is important give the participants a hint on their lerning progress. To keep motivation high, it is important for the participants to be informed about there learning progress.**

\*\*\*

Therefore, give the participants feedback. The feedback should be differentiated and objective, always beginning with the positive feedback. Criticism should always help the participants to improve the criticized aspect. Be sure to give the feedback in time, later feedback is not effective. Positive feedback can significantly increase motivation.

*One form to give feedback is to let the participants work on exercises, thereby they can see their learning progress. Explicit feedback by the teacher is also possible, for example by asking questions.*

## 27. DIGESTIBLE PACKETS

**People can only concentrate for a limited period of time. If a topic spans more than this time, the participants will have difficulties in understanding the topic in its entirety. Because comprehension decreases, the motivation will decrease, too, and the seminar will be considered difficult.**

\*\*\*

You should organize the topics in such a way, that the topics remain small and understandable. Ideally, each topic should be understandable on its own and should be finished during a reasonable amount of time, ideally the time the participants are able to concentrate. If the topic takes longer, make a break, and start with a quick REPEAT AFTER BREAKS to bring them back in line. Be sure to create logically consistent packets and show the interrelations among the packets.

*Be sure that at the end of each session (or at least of each day) the topic is finished, usable, and complete. The participants will leave with a feeling of accomplishment and satisfaction. You can use a SUMMARY to augment this feeling. As a consequence, you should also avoid to organize a seminar that only covers „dry, unimportant“ theory for the first three days, until at the fourth day, practically usable topics are taught. After at most two days, the participants will be disappointed and frustrated.*

## 28. GENERAL CONCEPTS FIRST

**The brain learns by associating new topics with already stored topics. The more associations the brain can create for each new topic, the better it remember the new topics.**

\*\*\*

Therefore, teach general concepts first. When teaching details, or other topics that are based on the general topics taught before, this has two positive consequences: The new topic can be remembered more easily, because it can be associated with the general concepts. And the general concepts are stored more thoroughly, because they become REPEATED TOPICS as new topics are introduced.

*For example, teach the concepts of defining logical interfaces first. Explain the advantages of pure interface definitions. Then introduce pure abstract classes (C++, Java) and interfaces (Java, IDL) and show how they implement the general concept of an interface.*

## 29. REPEAT TOPICS

**The ultimate goal of a seminar is that the participants learn something. There are some biological preconditions. The brain can remember things easier, if it can connect new topics to old ones, and it considers those topics important, that it comes across repeatedly.**

\*\*\*

Therefore, repeat important topics throughout a session and in other sessions. Create cross links to allow the participants to connect new topics to older ones. Be sure to repeat the important topics, and not more or less unimportant details. The participants' brains will interpret a repetition as „this is important“. Using older facts as a basis for new things is also a means of repeating topics, this is facilitated by teaching GENERAL CONCEPTS FIRST. Additional repetitions are of course provided by REPEATING AFTER BREAKS, or by recalling them in a SUMMARY session.

*There are different ways how things can be repeated. For example, exercises can be used. Or you could discuss and relate the three most important topics let the participants.*

### 30. RELEVANT EXAMPLES

**Examples serve two purposes: They should illustrate an abstract concept, and, perhaps more importantly, they should show that the newly learned concepts are relevant for the participants' work.**

\*\*\*

Therefore, always use examples from the participants' domain, thereby ADAPTING TO THE PARTICIPANTS BACKGROUND. They will be able to understand the examples and the underlying topics more easily because they are familiar with the domain. In addition, they can see that the newly learned concepts are relevant to them. Never introduce new topics in examples.

*Ideally, you should use examples that have really been (or currently are) a problem in the participants domain. Perhaps, the participants have already tried to solve the problem with other, unsuitable tools or techniques. Then, the participants can directly see, how their problems can be solved with the new knowledge.*

*In general, it is also important, that you use up-to-date examples. It is your job to gather such examples. It is also very bad to use examples that have already been solved with another, even more suitable technique.*

### 31. LEARNING IS WORKING

**Effective learning is only possible for the participants if they actively work on the topic. Passively listening to the teacher is very ineffective.**

\*\*\*

Therefore, be sure that participants work themselves. Learning by doing and trial and error are still worthwhile techniques. You should let them work out solutions to problems on their own. Be sure that the majority of the participants will find the intended solution, otherwise they will get frustrated. The teacher should be available to help and to answer questions and provide material for the participants to use.



Letting the participants explain a topics to a fellow participant can also be a very effective way of learning. One participants learns by explaining (see introduction) and the other on learns by closely observing whether his colleague explains it correctly. Running a seminar using these techniques requires significantly more time for the preparation. This pattern is related to ALTERNATIVE WORK FORMS and INVISIBLE TEACHER as well as DIFFERENT APPROACHES.

*During a seminar on Design Patterns, we formed small groups of participants who discussed about how the newly learned patterns could be used in their system, or which patterns are already used (without explicitly having identified the pattern). The teacher just helped to identify patterns if the situation was unclear.*

## 32. ALTERNATIVE WORK FORMS

Depending on the taught topics, there are different suitable work forms that can be employed. It is usually not the best approach to have the teacher stand in the front and present new topics to the passive participants. For many topics there are better approaches that actively involve the participants, they take part in the learning process more actively.

\*\*\*

Therefore, adapt the work form to the taught topics. There are many alternatives to the traditional presentations style. Learning works much better, if the participants actively work on a topic! Of course, there are other forces when you decide which work form is best, like time and space requirements, and the motivation of the participants. Always try to let the participants take part actively! If presentation is necessary, be sure to alternate the presentation phases (where the participants are passive) and the work phases (where the participants are active). This pattern is strongly related to INVISIBLE TEACHER and DIFFERENT APPROACHES.

*There are several ways how to involve the participants into the seminar. The most commonly used are group work, partner work, working alone, and discussions involving all participants. Especially for exercises, group and partner work is interesting and often more effective than working alone. It has the additional advantage of improving the cooperation of the group. It is ideal to alternate these forms, then there is also space for presentation style phases.*

*The presentation style should only be used if you intend to transport a lot of information in a short time. The emphasis is on information: Only use it for fact-style information. Do not use it for topics that have to be understood by the participants or for building up skill. Be sure not to get blinded by colorful, animated presentations that can be created with today's tools. They are a lot better than plain talking, but the participants are still passive!*

## 33. PROBLEM ORIENTATION

**It is very difficult for the participants to get a start on new topics. The introduction to a new topic must be as easy as possible for the participants. The participants should be motivated to learn the new topic.**

\*\*\*

Therefore, first introduce the context of the topic. Show the problem you want to solve. It is important for the participants to know where you will lead them, they must know the goal (solving a certain problem!). Relate new topics to previously learned topics. Teach the details of the solution, only in a second step, after the fundamentals are well understood. Always start with the overview, use a top-down approach and teach GENERAL CONCEPTS FIRST.

*You should discuss problems from the participants background, problems which they have already understood well. The seminar should give them the tools needed to solve this problem. Reference this problem repeatedly in the course of the seminar.*

## 34. NAME IS LAST

**The brain can only remember things that it understands well. Understanding means, connecting it to already known topics, creating associations. It is hard to remove**



**false associations. If you give new items names before participants have made the „right“ associations, it becomes harder to remove these false connections.**

\*\*\*

Therefore, always make sure the participants understand the topic, before you give it a name! If you mention a name before you explain it, participants might know some (possibly) wrong things about the name, creating wrong associations.

*A good example from the programming languages domain is teaching the use of the static keyword in C++. If the participants already know C, they might immediately associate the word static with their present knowledge. It is hard to work out the subtle differences. If you first explain what you want to achieve, and then give it a name, the chances are better that they understand the differences.*

## **35. HONOR QUESTIONS**

**You should make the participants think about what you teach them. Thinking also sometimes results in false assumptions.**

\*\*\*

Therefore motivate the participants to ask questions, also if they seem silly or if they show that a participant does not fully understand the topic. Always honour questions, not bright answers. If you have a working group of participants and if they accept you as a partner, the courage to ask „risky“ questions raises.

*This pattern was inspired by Prof. Joseph Bergin at EuroPLOP `99. He gives „tokens of approval“ to „participants who reveal that they are struggling with new concepts“ [PP].*

## **36. SEPARATE SIMILAR CONTENT**

**If a participant does not understand a topic in full detail, it is very difficult for him to see the fine differences to another, similar topic.**

\*\*\*

Therefore, be sure not to present similar, but slightly different topics in sequence. Separate similar contents in time and explain clearly, when one is used, and when the other one. Be sure that the participants did understand a topic before you introduce another, similar concept. Comparisons of two similar topics should only be done if the two topics are understood thoroughly. Never try to show the differences to not yet covered topics when explaining a specific topic.

*You should not teach the use of static in C and C++ in sequence.*

## **37. DIFFERENT APPROACHES**

**Every person has other channels through which he or she can obtain knowledge most effectively. You should always give the participants the chance to learn this way. In addition, it is important that every participant can use the learning channels that are most effective for himself. Not every participant learns the same way as the you do!**

\*\*\*

Therefore, provide different approaches to the same topic. Some possibilities include: Working with the hands, listening, reading, or explaining. If this is not possible, then at

least use different approaches for different topics, so that each participant has the chance to learn something. An average human being takes up over 83% of the overall knowledge with the eyes. So be sure to visualize important topics. ALTERNATIVE WORK FORMS can help here.

*It is also a good idea to use a combination of several channels, e.g. when explaining something verbally, you could show transparencies in addition. For the visualization of important topics, you can use transparencies, posters, models... You could let the participants draw a diagram that sums up your explanations.*

## **38. CHANGE MEDIA**

**It is boring for the participants to stare at the blackboard all the time and copy the things they read there. For every kind of topic, different media are most appropriate.**

\*\*\*

Therefore, you should change media during the sessions from time to time, ideally the medium used is always suitable to the taught content. Several different media are available: blackboard, overhead projector, slides or films, flipchart, beamer, and script. However, be sure not to create a „media battle“ using every possible medium in every session. By changing the media in the course of a seminar, the sessions are more diversified.

*The blackboard is well suited to explain processes or build up something because the creation process can be observed by the participants. The overhead projector can be used to show complicated diagrams or drawings, that have more informing character. Slides or films can be used to show real world applications of a topic, and they serve as a kind relaxation phase during a session. The flipchart is well suited to explain questions or to make notes. A beamer can be used together with the suitable animation software to illustrate a process. Of course it can be used as a replacement for transparencies by using a presentation software such as MS Powerpoint.*

*If you create and use transparencies, be sure to keep the following aspects in mind:*

- Give the participants time to look at the transparencies
- Use a font size that can also be read from the back rows (try it!)
- Use colours and different fonts to facilitate reading
- Don't overload them with too much detail (especially a problem when copying things from books)
- If more than one topics is displayed on a transparency, hide the topics that are not currently explained.

*If you want to explain a process, be sure to use a medium that reflects this process. Suitable media are animations, the blackboard or stacked transparencies. Do not present the full solution (e.g. on a transparency or in the script) and then verbally explain the process how to come to this illustration.*

## **39. MANUSCRIPT**

**A good manuscript is already half the way to a good seminar. A too detailed manuscripts ties the teacher too tight to itself, which has negative implications on BODY LANGUAGE. In addition, if the teacher only recites the words of the manuscript the teacher is redundant, and for the participants it is boring.**

\*\*\*

Therefore, a good manuscript should be built along the following lines: It should provide a good organization of the contents, including timelines. It should also contain hints on the use of media and other notes for you, the teacher. Very important facts should be stated explicitly, so that they can be cited during the seminar. Last but not least, everyone must find his own ideal form for the manuscript.

*The manuscript is not the same as the transparencies. The transparencies should contain only the important facts and leave the teacher enough freedom to explain things verbally. In contrast, the manuscript should be self-explaining and complete.*

## **40. PARTICIPANT'S MEDIA**

**The participants usually have to do two things at once: Understand the new topics and copy the text from a blackboard/transparency/slide. This is a very challenging task. You as the teacher should make this as easy as possible for the participants.**

\*\*\*

Therefore, create „equal chances“ for everybody. The teacher should use the same kind of media as the participants do, so the participants can copy things as fast as the teacher writes them. Keep in mind, that the participants should be given the chance to understand the topics they copy. Otherwise, they don't know whether they did understand it or not, and they cannot ask important questions.

*If you show complex drawings, give the participants hardcopies, don't ask them to copy the drawings manually while you explain them. If the participants have to copy things manually (which is good from a learning efficiency perspective), write them on the blackboard or on transparencies during the session. It is very frustrating for participants to enter the room and see a completely filled blackboard and hear the teacher saying „You can already start copying that...”*

## **41. DIFFERENT EXERCISE LEVELS**

**The most important aspect of exercises is to allow the participants to improve their skill by working on a topic on their own. To improve their skills, the exercise must be located at the upper edge of the participant's current skill level. Because this is usually not the case, there are some participants who consider the exercises overly simple (and don't learn anything) and some, that consider the exercises too difficult (and are frustrated, because they don't get them done; they don't learn anything, either).**

\*\*\*

Therefore, provide exercises of different difficulty levels, different approaches, different topics etc. Allow every participant to choose from these exercises, and solve those that he thinks are important, and suitable for his skill level. Doing this, everybody is successful.

This pattern only works, if the participants really want to improve their skill, and not just try to survive the seminar with a few efforts as possible.

A problem with this pattern arises, if people overrate themselves and try too difficult exercises. Especially in a group there might be the temptation to try a too difficult example because the neighbor/friend also tries the more complicated one. A participant will sometimes have to admit that he has to step back.

*The pattern can be implemented by giving participants a collection of exercises to choose from marked with a „skill level“, or you could put a collection of exercise sheets on a table, and everybody can choose whatever exercise he wants to work on.*

## **42. EXERCISES EMPHASIZE PROCESS**

**Often, people are frustrated if they don't get the right solution for an exercise, whereas „right“ is defined as the solution the teacher wants to see. The real use of exercise is to have the participants work on them, thereby working on a problem, creatively applying the newly learned topics.**

\*\*\*

Therefore, honour the work on the exercise, and not whether the solution is right or wrong. Additionally, in IT technology, there is often no „right“ or „wrong“ solution, there are alternatives. Another point is, that the solution may be conceptually right, and only some minor details keep it from actually working.

*An example could be the following: Don't ask the participants to write a program for a specific problem, but ask them to document how such a program could look like, which tools could be used, etc. Then, groups of participants could discuss the solution and perhaps create the final program.*

## **43. KIND OF EXAM**

**Often, the exam is seen as a problem by the participants, some are even afraid of it. As experience shows, in many courses the kind of exam is completely unsuitable.**

\*\*\*

Therefore, think about what kind of exam is suitable. Exams can be written or they can be verbal. You can differentiate among the participants by testing the skill or by testing how fast they accomplish the exam. You can also use a project that has to be done by each participant to find out about a participant's qualification.

*If your seminar aims at improving the skill of the participants, then a project serves well as an exam. A oral exam is also good, because you can get a feeling for how the participant solves problems. The disadvantage is that it is more work for you to find an appropriate mark. And the results are not as easy to prove and compare.*

*You should also ask yourself if it is necessary to give marks. Marks always create a way for the participants to compare to each other, which can be frustrating for those who are among the best.*

*If your seminar aims at acquiring a title such as „Certified Pattern Engineer“ then a written exam, perhaps using multiple choice questions from a previously published catalog is preferable. For such seminars, it is often unnecessary to give a mark, because it is only interesting if the participant has passed or failed.*

## **44. DIFFERENTIATED FEEDBACK**

**The course is not over after the exam. The participant can also learn from the mistakes made in the exam. A well designed exam can show the participant where they have weak points and what they understood well.**

\*\*\*

Therefore, try to give every participant a differentiated feedback after the exam. Give hints on how he can learn his weak points. To motivate the participants to be interested in the mistakes they made in the exam, be sure to promote the exam as a way to learn even more, not just as a way to get a mark.

## 45. SELECTABLE EXAM TIME

**Every participant learns with a different speed. And there are different daily forms of a person.**

\*\*\*

Therefore, give participants a chance to write the exam whenever they feel ready. Be sure not to judge participants on their learning speed, if the goal of the course is to teach skills

*You can give them a couple of days to choose from, e.g. each monday in following 4 weeks. Or you could write the test via the Web.*

## 46. TRIAL EXAM

**The participants are afraid of the exam and they repeatedly ask the teacher what the scope of the exam will be. They don't know how to prepare the exam.**

\*\*\*

Give the participants a chance to prepare the exam by writing a trial exam during the seminar. Be sure to ask the same kind of questions with the same difficulty level in the real exam, otherwise you will get incredible. The trial exam should be much shorter than the real exam, but should contain all types of questions that will be asked in the real exam.

*This trial exam does not necessarily mean more work for you, because you can compile it from exercises and the participants can correct the trial exam on their own with the help of a previously prepared solution. As an additional help, you can give hints on the topics that should be repeated if a specific trial exam question could not be answered successfully.*

## Related Patterns and Pattern Languages

There is another pattern language covering the same topic by Dana L.G. Anthony, it is called *Patterns For Classroom Education* and it is published in [PLOP2]. Its focus is on teaching „difficult technical topics“ and covers patterns like *Simulation Games* and *Debrief after Activities*.

The following paragraphs relate this pattern language to some of the patterns that can be found at the homepage of the Pedagogical Pattern Project [PP].

To implement the SUMMARY pattern, the *Class Concept Map Pattern* by Jeanine Meyer can be used. This pattern proposes that the whole class jointly tries to create a concept map that relates all the different terms and concepts taught during a session.

The *CoG-PADD* pattern by Donald J. Bagert also proposes to start with a motivating problem when introducing a new topic. This is also proposed in the *PROBLEM ORIENTATION* pattern in this pattern language. Ian Chai's *Concrete to Abstraction* pattern

[PPP] proposes to start a new topic with an example, thereby describing a real world problem that the new topic can solve. Alan O’Callaghan explains that a programming should be taught as „a means to solving problems“ in his *Model and Implement Pattern*.

The *Design-Implement-Redesign-Reimplement Pattern* by Steve Houk describes its intent as the following: „Explain new concepts and methods based on old concepts“. Although he restricts its pattern to teaching OO concepts, he uses the same approach as we do in our REPEAT TOPICS pattern.

Joseph Bergin’s *Early Bird* introduces the notion of teaching important concepts first, because „Students often remember best what they learn first.“ This is basically the same as we propose in our GENERAL CONCEPTS FIRST pattern.

*Expose the Process* by Byron Weber Becker describes that the „Students can benefit by watching idea develop“. This is related to our EXERCISE EMPHASIZE PROCESS pattern.

In his *Gagné-Ausubel Pattern of Lecture* Tim DeClue describes a way how the teacher can use alternative work forms to let the participants take part in the sessions actively. His pattern is based on the writings of Robert Gagné and David Ausubel. This pattern aims at the same problem as our ALTERNATIVE WORK FORMS. Mary Lynn Manns also proposes a more hands-on approach to teaching in her *Lab-Discussion-Lecture-Lab Pattern*.

Joseph Bergin and Jeanine Meyer introduced a pattern called *Gold Stars for Confusion*. It claims that „tokens of approval“ should be given to students who „reveal that they are struggling with new concepts“. Just as our HONOUR QUESTIONS pattern, it tries to motivate the participants to think about a new topic and ask if they have problems.

An special ALTERNATIVE WORK FORM is the *Icky Poo* pattern by Joseph Bergin and Owen Astrachan. They propose to use „very vivid physical analogies“ to „make the presentation of a complex topic unforgettable“. Jutta Eckstein’s *Incremental Role Play* pattern proposes the same for teaching OO concepts by „asking the students to behave as objects“.

A central intention of our patterns is to make participants really take part in the sessions. They should be motivated to think and contribute. In their *Round Robin Pattern* Kent Beck and David Bellin propose using a round robin strategy to make everybody contribute to a session. According to them, the problem is that in every seminar, after a short period of time there is a core of listeners and speakers, while the rest does not really contribute to the sessions.

Jeanine Meyer has a *Team Teaching Pattern*, which is basically the same as our TEACHER TEAMS, although she provides a more detailed description.

As mentioned above, these patterns can be found at the homepage of the Pedagogical Pattern Project [PP].

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PREPARATION CHECKLIST PATTERN. Bernd gave many useful hints that have been incorporated in several patterns. Hartmut inspired the Quick Access Table.

## Literature and Online Resources

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|-------|--|
| FV    | Frederic Vester, <i>Denken, Lernen, Vergessen</i> , 23rd edition, dtv, 1996  |
| MH    | Hilbert Meyer, <i>Unterrichtsmethoden (Bd.1 Theorie, Bd.2 Praxis)</i> , Cornelsen, 1987  |
| PLOP1 | Coplien, Schmidt (editors), <i>Pattern Languages of Program Design</i> , Addison-Wesley 1995   |
| PLOP2 | Vlissides, Coplien, Kerth (editors), <i>Pattern Languages of Program Design 2</i> , Addison-Wesley 1996                                  |
| PLOP3 | Martin, Riehle, Buschmann (editors), <i>Pattern Languages of Program Design 3</i> , Addison-Wesley 1998                                  |
| PLOP4 | Harrisson, Foote, Rohnert (editors), <i>Pattern Languages of Program Design 4</i> , Addison-Wesley 2000                                  |
| PP    | <i>Pedagogic Patterns Project</i> home page at <a href="http://www-lifia.info.unlp.edu.ar/ppp">http://www-lifia.info.unlp.edu.ar/ppp</a> |
| WP    | Wilhelm H. Peterßen, <i>Handbuch Unterrichtsplanung</i> , 6th Edition, Ehrenwith, 1982   |