Didactic Design Pattern „Highlights"

a pattern for peer-review.

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Abstract: The core intention of the pattern is to enrich the learner's perspectives by giving and receiving feedback through peer-review.

1. Introduction

The Design Pattern „Highlight" has been developed and used within a the master study course of Educational Leadership at the University of Education Ludwigsburg, Germany. The course is embedded into a blended learning architecture. The Pattern focuses on the E-Teaching aspects of the learning scenario and aims at capturing the *didactic* knowledge on how to use this method within an E-Teaching setting.

Feedback is often provided by the lecturer without referring to other students' works. Further more students are not used to give feedback on other students' results. This pattern captures a best practice on using a specific, didactic driven method within a learning environment and is therefore particularly useful for the following audience:

- □ *Teachers and lecturers* who want their students to gain a different perspective on a solution/topic.

- □ *Teachers and lecturers* who want to implement a formative assessment of their students.

Depending on the discipline lecturers are more or less used to enrich their teaching with digital media. In order to reach a broad audience of lecturers of all kinds of disciplines this pattern contains two parts each with a specific focus and level of abstraction:

On the one hand it focuses on a very technical and abstract perspective following the common pattern structure to submit the core intension (part 1).

On the other hand part 2 emphasizes a pedagogic view upon this topic to submit information which is needed for planning and using learning scenarios (Siebert 2006).

Special thanks to my shepherd Michael who encouraged me to merge both structures and gave brilliant feedback for improving this pattern. We had good discussions opening up new perspectives on this pattern. Thanks a lot!

2. The Pattern Language

This pattern is part of a pattern language which will include the following related patterns:
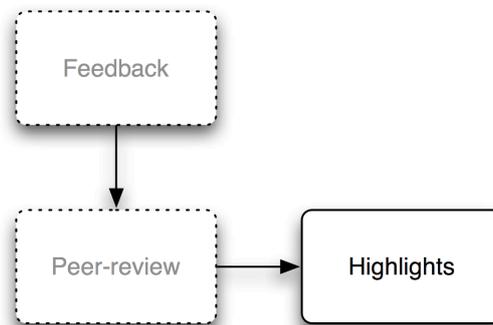

Figure 1: pattern language

3. Didactic Design Pattern „Highlights" (part 1)

Context

This pattern is effectively implemented within the master study course of Educational Leadership at the University of Education in Ludwigsburg, Germany. Within the module "personal management" this pattern provides a blended learning environment supporting the continuation of learning from the first face-to-face meeting. The students work on assigned tasks with the aim of exploring different points-of-view and a deeper level of inquiry into the subject matter. Following this broad and deep study, individuals create solutions and share them with their peers for reflection and comment. This interactive method fosters new views of the topic by exposure to a variety of understandings.

Problem

How can students gain different perspectives on solutions/tasks by providing feedback to one another?

Forces

Feedback plays an important role in regard to evaluating students' work, because it contains both positive elements and aspects that need to be improved in order to support the students' personal or academic development. Feedback is often provided by the teacher without referring to other students' works. Annotating students' work and giving feedback also increases the workload for teachers immensely.

Creating solutions, reviewing others' work, and receiving peer feedback allows students to explore new ideas and to gain a deeper and broader understanding of a given topic. Peer review provides the opportunity to learn from other students' work. Using this method teachers' workload is also significantly reduced.

Solution

In order to achieve this, **each student annotates the work of another student and returns it to the author who then picks one highlight to forward to the lecturer at a defined time.** He/she collects all highlights and publishes them to a learning management system.

A highlight in this sense is a concise portion of a solution that offers new insights into the given topic to reviewer. Due to the fact that every reviewer has a specific knowledge and point of view on the topic each highlight is very individual.

The solution invokes the following core activities (referring activities are explained within the implementation section, see part 2):
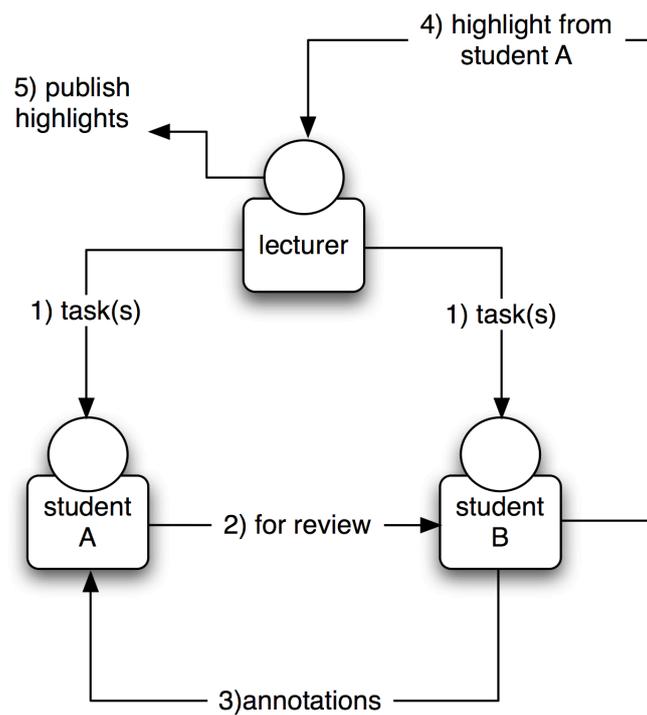

Figure 2: activities

Students work on the tasks they receive from the lecturer (1). The results of their work is forwarded to another student (student B) who acts as a reviewer (2). He/she annotates the work and returns it to the original author, student A (3). The reviewer also selects his/her highlight of the author's results and forwards it to the lecturer (4). The lecturer collects all highlights and publishes them (5).

The *teacher* acts as a coach, supporting the students in finding solutions to the given tasks. The *students* play the most active role within this phase by attending to the given tasks.

These activities are intended to make the students become aware of different approaches to the solutions, thus increasing their understanding and knowledge. These new understandings are brought about through the act of reviewing and annotating another students solution and viewing yet another peers' comments on their own solution.

Consequences

The benefits using this pattern are the following: Creating solutions, reviewing others' work, and receiving peer feedback allows students to explore new ideas and to gain a deeper and broader understanding of a given topic. Furthermore the students become aware of different perspectives by annotating their peer's work. Finally with peer reviewing being the primary mechanism of feed-back, lecturers can devote more time to observing and fine-tuning the learning process.

The liabilities using this pattern include the following aspects: The pattern is centered on students creating their own solutions as well as reviewing and commenting upon other students' work -- which, in turn, is then evaluated by the lecturer (primarily through "highlights"). The addition step of peer review adds time to the process. Also students depend on one-another to complete tasks on-time. Thus, all students must respect the time-frame of each task in order to complete the pattern on schedule. Another liability can be found in the dependency on technical resources, especially the Learning Management System.

Discussion

Alternative usage may focus on two levels. In regard to an organizational level it is possible to hand the tasks to the students in a face-to-face environment with the advantage that questions can be answered directly, in plenum. In addition to that aspect assigning a single task to the students (instead of clustering many tasks), reduces the student workload for creating and annotating the solutions.
In regard to the activity level the highlights may also be sent to all students via email or in a face-to-face learning situation instead of publishing them within a learning management system. Finally the lecturer may skip adding to student annotations in the event that student annotations and highlights cover the target learning goals.

Known uses

This pattern is effectively implemented within the master study course of educational leadership at the University of Education in Ludwigsburg, Germany. Within the module "personal management" this pattern provides a blended learning environment supporting the continuation of learning from

the first face-to-face meeting. All tasks are clustered. From the complete set, students choose five tasks to complete utilizing the pattern.

This pattern also works within the pattern writing workshops. An author submits his/her pattern to peers who review it and give highlights to the author who explores new ideas of what he/she can keep or improve and also gains a deeper and broader understanding of how his work is interpreted.

In other educational contexts such as discussing a paper, students read through the text, highlight their key aspects and contribute their individual perspectives to the peers.

Related Patterns

Feedback loop (T. Schümmer)

References

Reich, K. (2002). Konstruktivistische Didaktik : Lehren und Lernen aus interaktionistischer Sicht. Neuwied [u.a.]: Luchterhand.

Siebert, H. (2006). Didaktisches Handeln in der Erwachsenenbildung : Didaktik aus konstruktivistischer Sicht (5. ed.). Augsburg: Ziel-Verlag.

Wippermann, S. (2008). Didaktische Design Patterns zur Dokumentation und Systematisierung didaktischen Wissens und als Grundlage einer Community of Practice. Saarbrücken: vdm.

4. Introduction to part 2

The second part of the pattern emphasizes a pedagogic view to submit information which is needed for arranging and using learning scenarios (Siebert 2006). It aims at supporting those lecturers who are not used to enrich their teaching with digital media and those who only have a weak affinity to such media usage by presenting essential pedagogical aspects.

5. Structure of Didactic Design Patterns

Theoretical Background

These aspects refer the constructivistic didactic (Reich 2002). It contains the most holistic processes for arranging learning scenarios under a pedagogic perspective and is therefore essential for the Didactic Design Patterns (Wippermann 2008).

Meta-Pattern - new structure

The pedagogical elements are integrated into a new pattern structure (meta-pattern). The structure of each *Didactic Design Pattern* follows four main sections (Wippermann 2008):

metadata
didaktische motivation
implementation
reflection
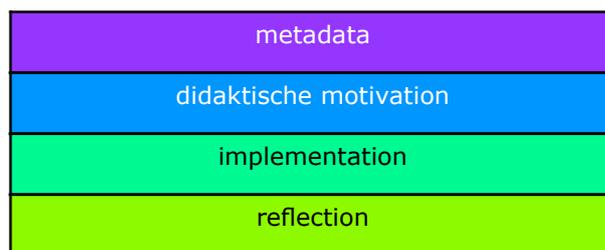
A specific color represents each section on the right hand border of the pattern in order to help the reader navigation through it.

Each sections contains specific items to structure the knowledge within each pattern:

1. metadata

- name,
- date,
- status,
  - *draft version,*
  - *work in progress,*
  - *final version,*
- author,
- characteristics of E-Learning,
  - *communication vs. content centered,*
  - *synchronous vs. asynchronous,*
  - *independent on vs. dependent on special location.*

2. didactic motivation

- abstract,
- didactic motivation,
- hints for implementation,
  - *amount of learners,*
  - *social learning aspects,*
  - *state of learning,*
  - *time needed for implementation,*
  - *degree of competencies,*
  - *instruction vs. construction*

3. implementation

- didactic steps
  - planning and preparation,
  - information and instruction,
  - activities,
  - implementation,
  - evaluation,
- drama ,
  - *roles,*
  - learning activities,
- *tasks,*
- embedding,
  - *learning activities before pattern usage,*
  - *learning activities after pattern usage,*
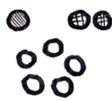- technical preconditions,
  - tools.

4. reflection

- problems,
- discussion,
  - *advantages,*
  - *disadvantages,*
  - *alternatives,*
- examples,
- references,
- related patterns.

Meta-Pattern - Characteristics at a glance

To provide an overview at the glance regarding didactic aspects each pattern starts with a visualization showing the characteristics of seven didactic items (see 2. didactic motivation).

The following table shows the variety of each item linked to a specific icon that allows a faster understanding (Wippermann 2008):

icon	name	characteristics
	e-learning	▪ synchronous vs. asynchronous, ▪ communication centered vs. content centered ▪ dependent on vs. independent on special location.
	amount of learners	▪ small, ▪ middle, ▪ huge.
	social aspects	▪ individual work, ▪ team work, ▪ group work, ▪ plenum.
	state of teaching/learning	▪ to start off, ▪ to work, ▪ to integrate, ▪ to evaluate.
	amount of time needed	▪ days, ▪ weeks, ▪ months.
	teacher's competencies (in realizing the pattern)	▪ few, ▪ some, ▪ many.
	instruction vs. construction	▪ instruction, ▪ construction.

The characteristics of all items are gathered and visualized in order to provide selective knowledge of the pattern (see 6.).

Additional information about a pattern (version number, status, ratings) are also provided next to the characteristics stated above (see 6. and Wippermann 2008).

All of these information is essential for arranging learning scenarios and especially support lecturers who do not have a strong affinity to digital media in gaining an idea of the patterns' potential.
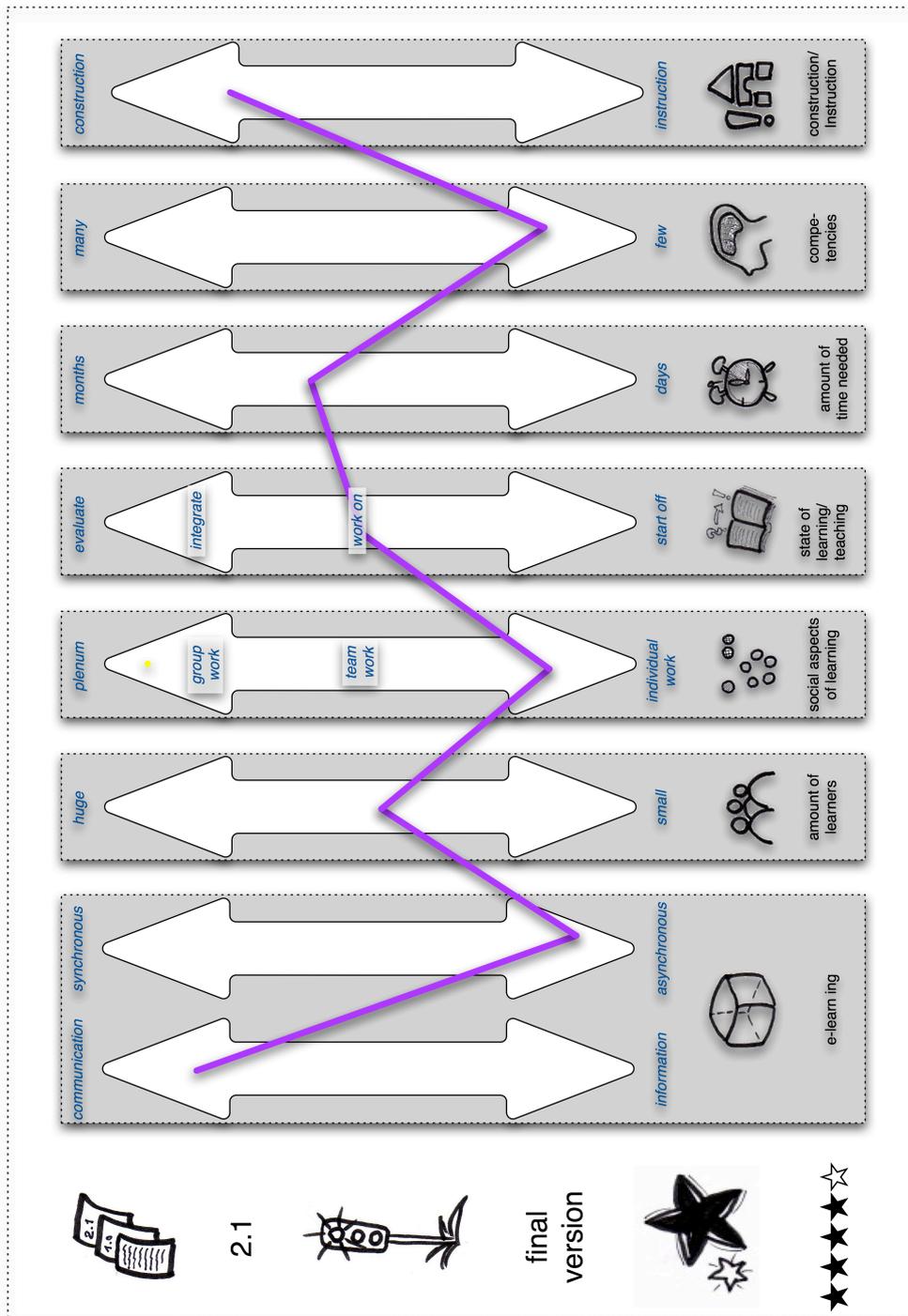
6. Didactic Design Pattern „Highlights „

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12.08.2004 - 12.02.2008

construction		instruction	construction/ Instruction
many		few	compe-tencies
months		days	amount of time needed
evaluate	integrate · work on	start off	state of learning/ teaching
plenum	group work · team work	individual work	social aspects of learning
huge		small	amount of learners
synchronous / communication		asynchronous / information	e-learn ing

2.1   final version

Didactic Motivation

The students work on assigned tasks with the aim of exploring different points-of-view and a deeper level of inquiry into the subject matter. Following this broad and deep study, individuals create solutions and share them with their peers for reflection and comment. This interactive method fosters new views of the topic by exposure to a variety of understandings.

Abstract

This pattern describes the handling of individual students' work results within a given time-frame: At a defined time each student sends his solution to another student who annotates the work and returns it to the author who then picks one highlight to forward to the lecturer. He/she collects all highlights and publishes them to a learning management system.

Implementation

1. **Planning and preparation:**

a. Conceptual design of tasks
    The lecturer designs different tasks in regard to a specific learning topic and lso states his requests for the solutions (e.g. complexity of results etc.). He/she has to bear in mind that the student's results have to be composed on a computer in order to send them to another student quickly and easily -- and to be published within a learning management system.

b. Clustering of tasks
    The lecturer unites the designed tasks (see above) to thematic clusters and defines the number of tasks within each cluster.

c. Definition of annotation mode
    One process of assigning student reviewers is based on simple alphabetical sequence: Each student forwards his results to the student whose surname falls immediately after his/her own surname, alphabetically; the student at the end of the alphabetical list forwards the results to the first student on the list. The lecturer is responsible for the alphabetical student listing (which should include email addresses).
    Lecturers must also define the specific type of feedback that students should focus their annotations upon (e.g. correctness of results, new view/insight on topic, etc.) and how the annotations should be formatted (e.g. below the result in a different color, etc.).

d. Definition of a highlight

The lecturer defines the meaning of the term "highlight". A useful working defini-tion is "a concise portion of a solution that offers new insight into the given to-pic". Furthermore, the lecturer must also specify the number of highlights to be included with each solution. The number of highlights included with a solution should be a subset of the total comments provided (e.g., students may include as many comments as they wish, but they must select 3-5 comments to distin-guish as highlights).

e. Definition of time-frame

The implementation of this pattern is based on a specified time-frame based upon the amount of work assigned to the students (see Tasks above.). The follo-wing deadlines have to be defined:

– date on which results have to be forwarded to next student (see c.) via email.

– date on which the foreign results have to be annotated and sent back to the author.

– date on which the chosen highlights have to be sent to the lecturer.

– date on which the highlights have to be published to the learning manage-ment system.

f. Preparation of learning management system

All highlights will be published to the learning management system. The lecturer is responsible for meeting the technical requirements and for ensuring that the system works properly (it might be necessary to set up a secure learning space for the course).

g. Initiating student work

A message providing instructions for the students should be composed. This message should include all necessary instructions as defined in the Planning and Preparation phase. (see Activity Phase).

During Planning and Preparation, only the lecturer plays an active role in specifying and designing the learning activities and setting-up the learning environment.

2. **Information and Instruction:**

The lecturer sends the Instructions and all necessary materials to the students via email.

The lecturer activities within this phase are: providing instructions to students regarding learning activities and responding to student questions.

The students occupy themselves with the given activities, posing questions as desired.

3. **Activities:**

a. Individual task activities

The students work on the given tasks individually and compose their results via computer, respecting the specified deadlines.

b. Forwarding results to peers

The results are properly annotated/commented and are then forwarded to the appropriate within the specified time (follow deadline).

c. Annotation of peer results

Within the defined time-frame the results are annotated by the students following the annotation mode. Students should give special attention to potential highlights.

d. Return results with annotations to student

The annotations are sent to the author within the specified time-frame so every student receives feedback on his results.

e. Send highlights to lecturer

Following the schedule, the reviewing student choses the recommended number of highlights (among all annotations), and sends the highlights with the results and complete annotations to the lecturer.

f. Collecting highlights

The lecturer collects the highlights and arranges them according to the task clusters.

Within this phase of implementation the lecturer acts as a coach, supporting the students in finding solutions to the given tasks.

The students play the most active role within this phase by attending to the given tasks. These activities are intended to bring students into awareness of different approaches to the solutions, thus increasing their understanding and knowledge. These new understandings are brought about through the act of reviewing and annotating another students solution and viewing yet another peers' comments on their own solution.

4. **Presentation:**

a. All highlights are summarized in one digital document.

b. This document is published within a specified area within the learning management system.

Here, the lecturer is active in the role of publishing the student's highlights.

5. **Evaluation:**

The lecturer should take the opportunity to provide additional commentary on the received highlights. These annotations may be included in the electronic document (see 4.), or published separately within the learning management system.

This pattern is incorporated in a specific learning context which consists of these sections:

1. Introduction section
   Tasks focusing on special topics that have to be introduced to the student.

2. Closing section
   This pattern ends with the publication of the student highlights. However, a discussion of the highlights will also support and extend the learning process.

The implementation of this pattern is linked with specific technical preconditions and may be supported by necessary tools.

1. Technical preconditions

   a. Email account,

   b. web browser,

   c. learning management system,

   d. valid account for learning management system,

   e. text editor or word processing application.

2. Tools

   a. Email account
      Free email accounts are available from yahoo.de, web.de, gmx.de or others.

b. Email client

Most providers offer a web interface which can be used to sent mail. A free email client named thunderbird is available under this URL (http://www.mozilla.org/, retrieved 23.08.2007).

c. Web browser

A web browser is installed on almost every computer. Free browsers are also available: firefox (http://www.mozilla.org/, retrieved 23.08.2007) opera (http://www.opera.com/products/, retrieved 23.08.2007), safari (http://apple.de/, retrieved 24.11.2007).

b. Learning management system

A german version of the learning management system named moodle is available under: http://www.moodle.de/, retrieved 23.08.2007. A free trial account to BSCW (basic support for cooperative work / be smart - cooperate worldwide) may also be used as learning management system: http://public.bscw.de, retrieved 23.08.2007.

c. Valid account for learning management system

All student must have a valid account in order to access the highlights.

d. Text editor or word procession application

A free office suite is named Open Office is available here: http://de.openoffice.org/, retrieved 23.08.2007).

Reflection of the Didactic Design Pattern

1. **Potential problems**

   a. Technical problems

      1. See technical preconditions (it is advisable to save the documents in the rich text format).

      2. The tasks, results and annotation must be composed on a computer.

   b. Vague instructions

      1. The tasks must be written in clear, concise prose so that the students readily understand what to do. This is very important because --in contrast to face-to-face learning-- the lecturer has no opportunity to react directly to student's questions e.g. interpreting gestures, receiving and providing instantaneous clarification, etc.
      Questions about the structure of the pattern should be answered and forwarded to all students (such as in a Frequently Asked Questions document published to the Learning Management System).

2. The annotation mode must be specific and concise to facilitate forwarding results.

c. Management of deadlines

    2. This pattern consists of different sections with specified time-frames to be defined, communicated and followed.

2. **Reasons for not implementing this pattern**

a. Insufficient technical resources.

b. Insufficient time to allow for proper implementation.

3. **Advantages of the pattern**

a. Creating solutions, reviewing others' work, and receiving peer feedback allows students to explore new ideas and to gain a deeper and broader understanding of a given topic.

b. The students become aware of different perspectives by annotating their peer's work.

c. With peer reviewing being the primary mechanism of feedback, lecturers can devote more time to observing and fine-tuning the learning process..

4. **Disadvantages of the pattern**

a. The pattern is centered on students creating their own solutions as well as reviewing and commenting upon other students' work --which, in turn, is then evaluated by the lecturer (primarily through "highlights"). The addition step of peer review adds time to the process.

b. Students depend on one-another to complete tasks on-time. Thus, all students must respect the time-frame of each task in order to complete the pattern on schedule.

c. Dependency on technical resources, especially the Learning Management System.

5. **Alternatives**

a. Organization

    1. It is possible to hand the tasks to the students in a face-to-face environment with the advantage that questions can be answered directly, in plenum.

    2. Assigning a single task to the students (instead of clustering many tasks), reduces the student workload for creating and annotating the solutions.

b. Activities

1. The highlights may also be sent to all students via email or in a face-to-face learning situation instead of publishing them within a learning management system.

2. The lecturer may skip adding to student annotations in the event that student annotations and highlights cover the target learning goals.

The following statement clarifies the implementation of the pattern:

This pattern is effectively implemented within the master study course of educational leadership at the University of Education in Ludwigsburg, Germany. Within the module "personal management" this pattern provides a blended learning environment supporting the continuation of learning from the first face-to-face meeting. All tasks are clustered. From the complete set, students choose five tasks to complete utilizing the pattern.

References:

No specific references.

Online glossary: http://www.e-teaching.org/glossar, retrieved 30.08.2007

The Didactic Design Patterns create a network and are related to each other

Related Didactic Design Patterns

- Use of Themenweb,

- virtual collaboration,

- virtual mood barometer.

Related Support Patterns

- StudienMail,

- Introduction Page of Learning Management System.