^{edu}WEAVER:

A Web-based Instructor Management Tool
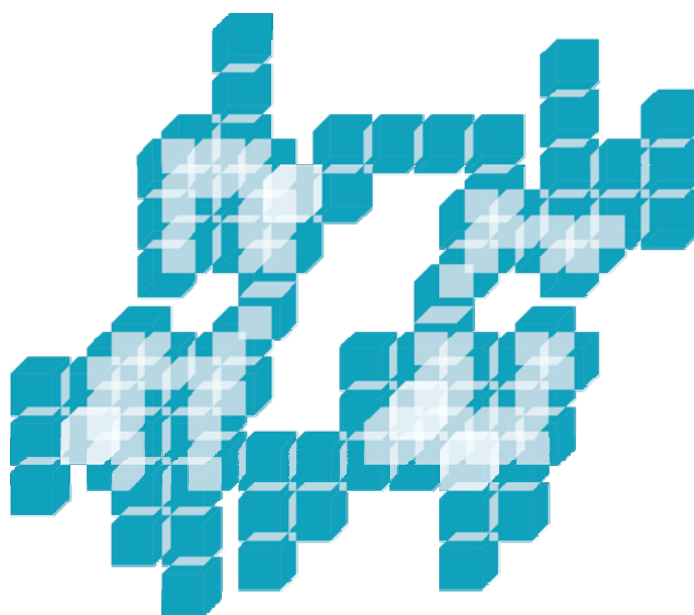
Task of Contents

1 Introduction

^{edu}WEAVER supports you from the first concept over the planning, building, organisation up to the presentation of your content of teaching. This guideline aims to get you in touch with the tool and gives you an overview about functions and benefits of potential applications of ^{edu}WEAVER.

1.1   What is ^{edu}WEAVER?

^{edu}WEAVER is a web-based tool, which supports the management of courses. Its target group are all people engaged in the field of teaching, such as employees at Universities or schools and advanced training teachers. The tool has been developed in 2002 and was co-funded by the Austrian Federal Ministry of Science and Research. ^{edu}WEAVER was developed in context of the project ^{edu}BITE [1] under the initiative "Neue Medien in der Lehre[2]" (which means new media in teaching). The main objective of the project is to support you on your way of producing your didactical teaching and learning processes and also to make e-learning materials and contents reusable. You can use your self-created courses and contents but it is also possible to get access to other user creations, if the original creator agrees. This knowledge pool is also a platform for learning materials and enables this frequent knowledge transfer between lecturers. Here, it is possible for every user to get access to created and available courses. ^{edu}WEAVER supports you also when publishing your courses for making contents of teaching and course schedules online available for your course participants. With the aid of standardized export functions it is possible to embed your modelled courses in e-learning platforms, or also to generate a HTML document for publication on the Internet.

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[1] www.edubite.dke.univie.ac.at

[2] www.nml.at

The commitment to learning management systems and learning platforms has increased during the previous years. Learning platforms permit the administration of user data and learning materials, chats and forums, which are often already integrated in learning management systems and enable thus an interaction and communication between students and lecturers. Learning contents is procured on learning platforms. However this step often requires technical know how. Also the design of course structures is linked with larger difficulties, because they have to be designed within the learning platform. That is exactly the point where ^{edu}WEAVER produces relief as it offers you a graphical and interactive user interface for modelling your courses.

1.2   What is ^{edu}BITE?

In 2002 several Austrian Universities and Universities of Applied Sciences launched the project ^{edu}BITE. The name ^{edu}BITE stands for *Educating Business and Information Technologies*. The development of e-teaching and e-learning contents, in the form of reusable learning objects and their development was one of the major goals of this project. Another priority goal was assisting the lecturers to teach their electronic documents and create one of the first exchange platforms for lecturers. The project itself is adapted according to the need of Austrian academic teachers' interests of innovative and didactically useful commitment of new teaching and learning technologies using multimedia teaching materials.

In the course of the ^{edu}BITE project the association *AKIT*[3] has been founded, which serves as an exchange platform between academic professors. The association made it to its duty to discuss and promote the exchange and common use of teaching materials. It became possible to create learning materials under equal conditions, standards and eventually to share them

^{edu}WEAVER is as well as the AKIT association part of the ^{edu}BITE project

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[3] Akademische IT Lehr- und Lernplattform (this means academic IT teaching and learning platform , www.akit.ac.at

with other academic lecturers. With this efforts the work for creating such courses that follow the same educational goals, can be minimized and at the same time the quality can be maximized, as the lecturer can use the learning materials of some colleagues if he or she agrees.

1.3 ᵉᵈᵘWEAVER for lecturers

The most important benefits:

- ᵉᵈᵘWEAVER offers you the possibility to publish your learning objects (for e-learning or for presentations), you can share them with other lecturers and at the same time you have access to a constantly growing pool of learning objects.

- ᵉᵈᵘWEAVER offers a hierarchically arranged modelling interface that allows modelling your courses graphically. You have the possibility to create a new course or you can take existing courses, if the lecturer who designed the course agrees. The existing course can be reused or be changed.

- ᵉᵈᵘWEAVER offers you several possibilities of the course presentation. You can generate a valid HTML document with the HTML export, which includes the structure and all embedded learning objects of your course. This can be made available for your students. If there is already a learning platform in use at your institute, you can choose between several different XML-export standards for example SCORM[4], IMS[5] Content Package, which is usually supported by several platforms (like Moodle[6], Blackboard Vista[7], Ilias[8], and others). With ᵉᵈᵘWEAVER you are absolutely independent with the presentation of your courses.

3 of the most important benefits of ᵉᵈᵘWEAVER

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[4] Sharable Content Object Reference Model; eduWEAVER supports SCORM 1.2 and SCORM 2004 3rd Edition, look at www.adlnet.gov

[5] Innovation Adoption Learning, look at www.imsproject.org

[6] Moodle Course Management System, www.moodle.org

[7] Blackboard Learning System, www.blackboard.com

[8] Ilias Learning Management, www.ilias.de

2 The tool ^eduWEAVER

The most important function of ^eduWEAVER concerns the modelling of courses. The graphical modelling interface of ^eduWEAVER allows you to create courses on four different levels that are connected by appropriate correlations. The structure and expiration of the courses are specified, whereby the respective course is defined more exactly from one level to another. Every modelling level is different in its granularity. With this structure it is left to the course modeller, how detailed the course will be designed.

The conceptual model - the four model levels and the learning object pool

2.1   The different model levels in ^eduWEAVER

Figure 1 shows a first overview of the different model levels. As you can see in figure 1, all levels are based on each other and this is what makes modularity.
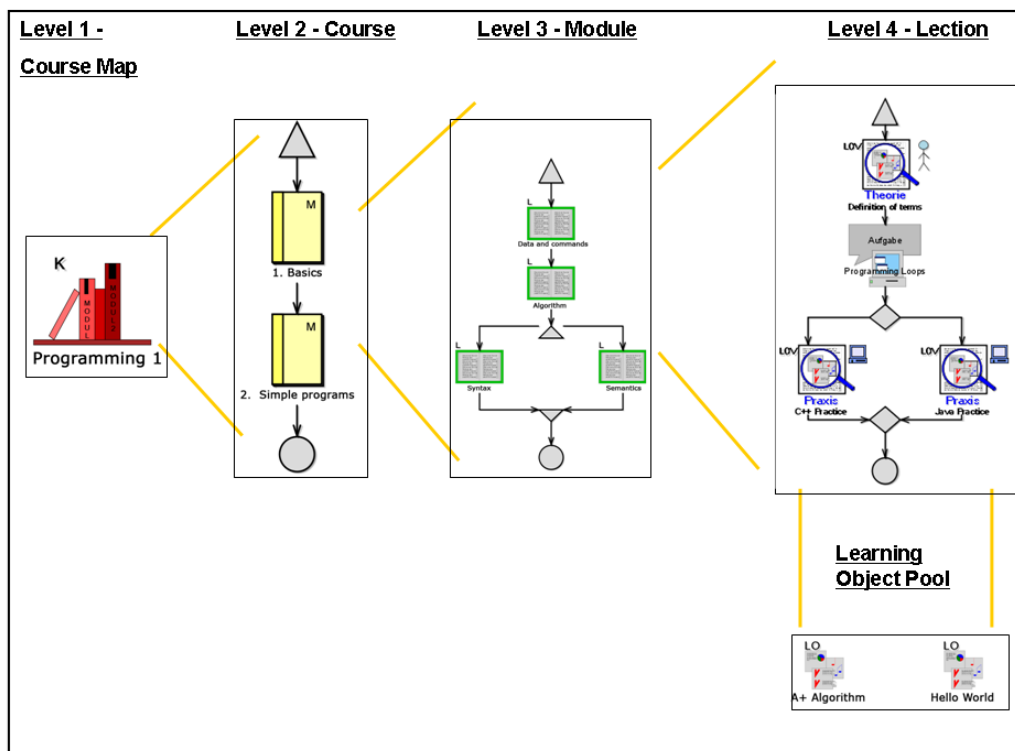

Figure 1 – Structure of the model levels

Course map

The course map is the first level in the whole picture and gives a graphical view over all offered courses within the course map. In this level the granularity is at its smallest point. There are no sequences or connections between the individual courses, so all of the displayed courses are independent. For the course designer it can be a starting point within the activity of course planning, if for example operational sequence is not certain yet.

Course

The second level in ^{edu}WEAVER consists of individual modules. In this level the course from the first level is split up into thematically connected modules. In figure 1 the learning process is already modelled; there is a chronological sequence of the modules and the presented modules are connected.

Module

In this level a module is split up into different lections. A lection covers a unit that lasts about 45 – 90 minutes. The big difference between this level and the other two preceding levels is that the person, who models the course, has not to retain the chronological way of modelling. In the third level, it is possible to model loops and parallel paths. This means that several alternative course solutions are possible, which have not to be designed at this moment. How the course will be designed is left to the course designer. In addiction to the contents and structure, the final model of the course depends on the previous knowledge of the students.

Lection

In the fourth level the granularity is at the highest point. Now the individual lessons are split up into learning objects. Learning objects are modelled in this level and so they become part of the learning process. In the lection level there is also the reference to the learning object pool that allows direct linking with the learning contents.

Each level has a special function and varies its detailedness

Course structure is independent from course contents – keyword: modularity

The learning objects of the lecturer are located in the learning object pool. These objects are connected with physical learning materials, like external learning resources as e.g. PowerPoint slides, different text documents, Internet pages and similar materials. The learning object pool represents the data base of all learning objects and is visible and available for each user, if the user has the necessary access rights. Consequently, the idea of common exchange of learning objects is supported and can thus be reused with the next transformation or production of new courses. This means that in the learning object pool are learning objects that contain learning materials.

2.2 Separation from contents and structure

Because of the strict separation from contents and structure, the following benefits can be achieved: reuse, integration of several people covering production and overview. These goals will be attend, if all course documents are available as learning objects and thus the modelling levels can be used to commit the course schedule. All users are subject to the same modelling conditions and this is the reason why there is the possibility of exchanging learning objects as well as available course structure between lecturers. If learning objects are referenced to a modelled course, there will be the connection between several learning objects and the course structure. Beyond, it is just possible to reuse parts of such learning objects or courses. So there will be a reduction of time and costs because courses will be available in their structure and it is possible to share and trade them. Therefore, the aim of modularity is to adequately exchange course structures and learning objects.[9]

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[9] Compare e.g. Derntl, M., Motschnig-Pitrik, R. (2003): Conceptual Modeling of Reusable Learning Scenarios for Person-Centered e-Learning. In this paper the authors recommend a conceptual modelling for learning design.

2.3   Sequence

The course structure should not only be reused but also be didactically well prepared. By the partition of the course structure in one of the four levels with their different granularity, a learning process can be designed optimally. Different possibilities of modelling, like parallel structures and decisions, ensure an optimal didactical editing of training and learning process for courses. Additionally, the aforementioned learning object pool is available, which allows integrating learning objects. These objects are linked to the actual course materials.
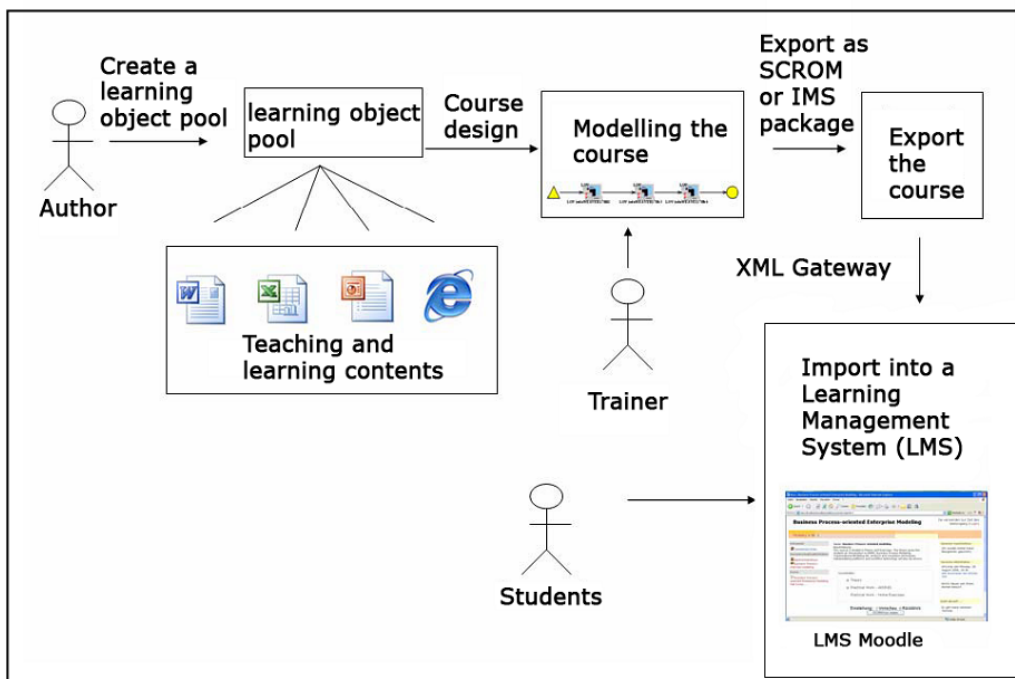

Figure 2 - The method eduWEAVER

This setting is shown in figure 2 represents several processes and roles when using ^{edu}WEAVER. The building sequence can be arranged in three parts: learning objects, modelling the course, and exporting the course to available learning management systems.

Building learning objects

A lecturer provides e-contents if he creates learning objects and thus he also expands automatically the learning object pool. In this case training and learning contents represent the external resources and in the model

Individual levels are connected by references

these resources are distinguished as learning objects. Of course, it is possible to reuse already created learning objects or parts of learning objects.

Course modelling

At this point the sequence and structure of courses are designed. The levels are connected and it is possible to use the learning object pool for connecting the course materials with a course model. The reusability of the modelled course structure is also given- so the amount of work for lecturers in the lead time can be minimized. The lecturer can design a course in the aforementioned four different levels, which offer different granularities (as shown in figure 3).
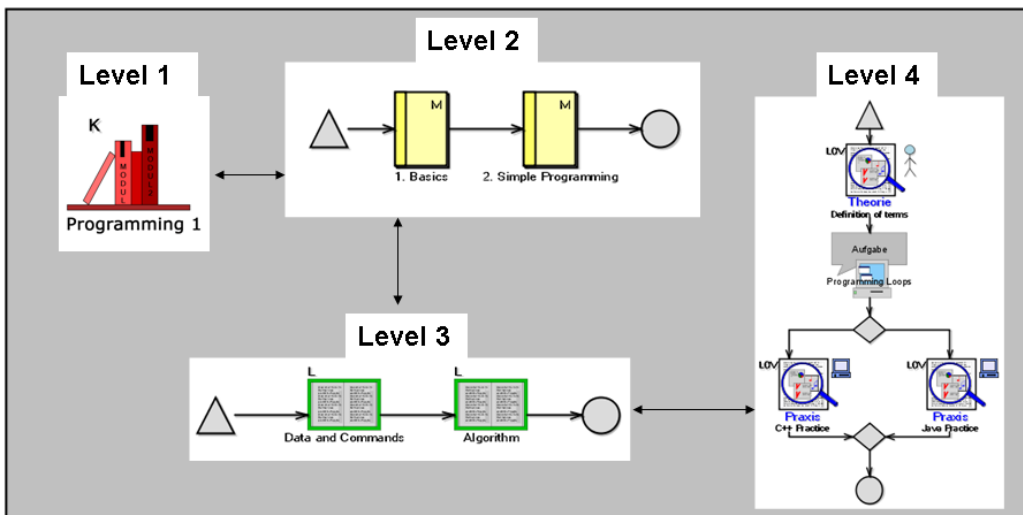

Figure 3 - Four course levels

Course export

Another important point that is also supported by ^{edu}WEAVER concerns the preparation of course presentations. A course with its contents is made available online for interested students. If you use a web based e-learning platform like Moodle, Blackboard Vista, Ilias, or similar, it is very easy exporting your course with for instance the SCORM standard and transfer eventually the course to the used platform. In case you do not use any of these platforms, you can also export your course in HTML format. This HTML export also accepts publication of courses without referring to a learning management system and can easily be generated in a web page based on

Choose between export in certain standards or HTML / XML

HTML source code. If you just want to export the used learning objects, you can simply refer to the file-export functionality. Hence, ^{edu}WEAVER is absolutely independent and can be used completely detached from a learning management system.

3 The idea of ^{edu}WEAVER

The most important attributes are structure, reusability, independency, flexibility and the possibility of personalised approach. These benefits exist during the whole building process of a course and guaranties high modularity for later usage.

3.1 Structure and modularity

All project partners of the project ^{edu}BITE act in the teaching area. During the development of the project the participants realised that the fields of interest covers nearly the same subjects. Thus, the idea of reusing or common use of learning objects has been settled. The idea of reusage and common use of several learning objects including teaching contents has been eventually realised in order to avoid a high preparation time for teaching materials.

In order to model didactically valuable learning and teaching processes, it is very important to focus on structure and building. The building of courses in ^{edu}WEAVER happens on four different levels. These levels predominantly differ by their granularity. The first level, the course map, has the lowest granularity and acts as a first overview. In this section courses are roughly arranged to get a first structure. On the second level, course level, the course will be split up in different modules and is composed together of lections of the third level. The time component helps us to get a first rough time sequence modelled. This means that each module consists of lections of similar subjects and themes. Respectively these lections are building upon each other or provide the basis for the next course. A lection consists of learning contents of approximately 45-90 minutes. Like in the other levels, it is possible to define a correct sequence. On the fourth and last level lections will be defined as learning objects. A learning object is the smallest unit in ^{edu}WEAVER and represents the contents of a course unit in

Courses can be reused as a sample for new courses

form of electronic materials. The granularity of this level is at the highest point and so the lection level is the most detailed. Because of splitting the course in four levels, a constant structuring of the course can be achieved, which ensures the support of a highly didactical formatted learning process. The modelling of a whole course, which matches with all rules, is very time consuming and work intensive. Lecturers, who teach more than one course and want to make courses available through the Internet, must invest a lot of time in the creation of the online courses. If you want to change something after creating learning materials, working time will increase. This is the reason why the reusage of already modelled courses is so important. It is possible to reuse the whole model or just pick several parts of the model to reuse them. It is well known that the respective contents will be changed more often than the structure, but ^eduWEAVER supports you in both cases. The tool is able to support you in changes from structure and contents.
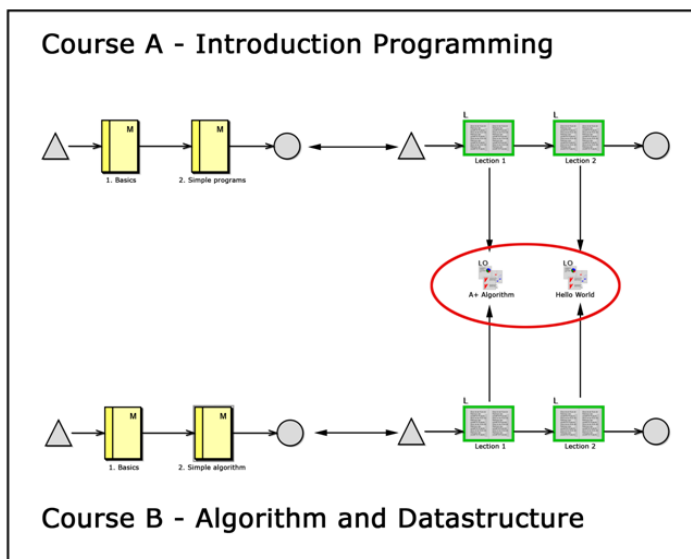

Figure 4 – Reusage from learning objects in two different courses

Figure 4 shows you a possibility of how two learning objects (course A and course B) can be reused. These two courses use the same two learning objects and so there are two big benefits: (1) it is possible to reuse the same learning object several times and (2) if the contents should change, every linked course uses the adapted contents. In figure 4 you can see that

All modul levels and learning objects can be reused

the reduction of the working time is not only a result of the reusage of learning materials, but also due to the reusage of parts of the structure.

The idea of splitting up contents in smaller units, like learning objects, should be performed due to the following example:

A mathematics lecturer teaches two different classes at a high school. One of the two is a third class and the other is a fifth class. The teacher wants to use some learning contents from the fifth class in the third class. The mathematical knowledge between the two classes is different and so the lower class can not capture all knowledge to be transferred in the higher class. So the teacher just wants to reuse a part of the learning objects from the fifth class. If he models the learning process with ^{edu}WEAVER, the whole focused contents is split up in learning objects and thus he can choose contents according to requirements. Learning objects are very detailed units and are used in the learning process of the fifth class. Same focused contents, split up in learning objects, may be taken over for the third class. So some learning objects could be multiply used in different classes.

In ^{edu}WEAVER the reusability has been attained through the development of a learning object pool. The learning object pool includes all available learning objects, which were generated by a group of lecturers by following the ^{edu}WEAVER modelling standards. These standards were fixed by the ^{edu}BITE Project and the Austrian metadata specification for e-teaching and learning resources, to ensure platform independency. Figure 5 represents such a learning object that has been generated according to the above named standards.
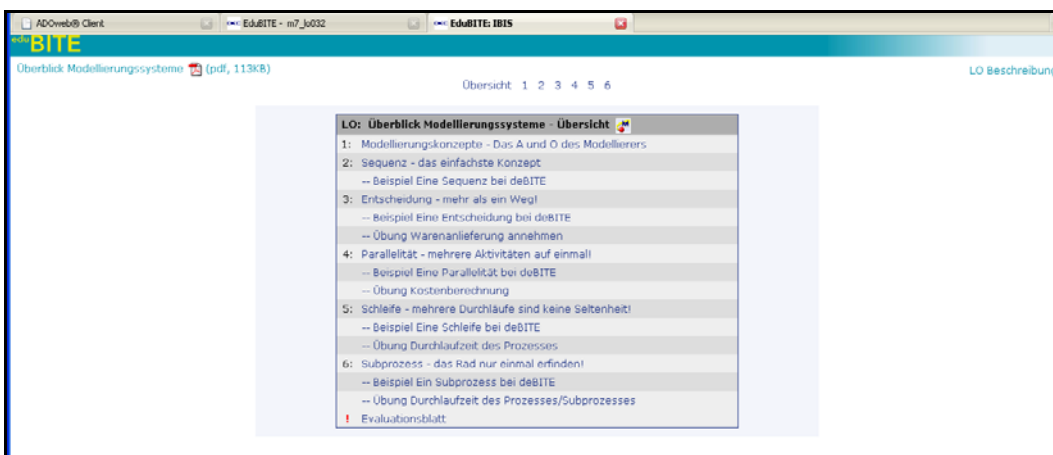
Figure 5 - eduWEAVER learning objects (this picture is just in German available)

Learning objects can be slides that have been created with PowerPoint, or they may also be simple PDF files. The learning object pool represents a repository, which is nothing else then a storage space for all learning objects and their learning contents. Users have the possibility to choose learning objects out of a pool for their own courses and so a high rate of reusage of learning objects can be achieved.

3.2   Independency

Independency is another important idea realised in ^{edu}WEAVER. This tool takes the role of an intermediary between contents (HTML, PDF, PowerPoint, audio or video files) and learning management systems (LMS). Contents that is generated outside from ^{edu}WEAVER, can be merged in the tool and eventually be exported for example in a LMS (as shown in figure 6). The teaching and learning contents can be generated with editors (a learning object, shown in figure 5) or be imported and used as several files. All teaching and learning contents is stored in the learning object pool and is available anytime for ensuring an efficient use of the tool, it was very important for the developers to keep ^{edu}WEAVER completely independent from any platform. Only if the created course is published afterwards, it reaches the desired audience. To ensure that all teachers are able to use this tool, the HTML export was developed. So it is also possible to publish your course in the Internet, if you do not have access to a LMS.
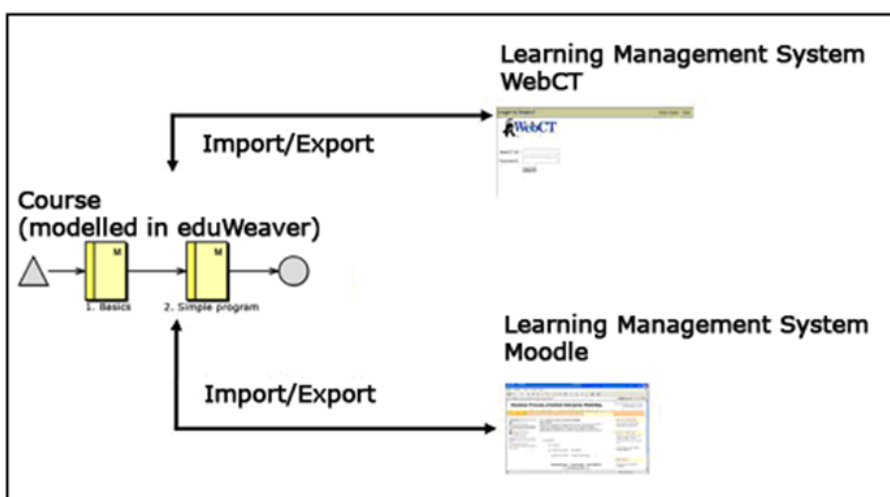

Is it possible to use a course on several learning platforms? Yes, due to the export possibility in ^{edu}WEAVER this is no problem!

Figure 6 - Import of a course in a learning management system

Figure 6 shows the export / import of a course in two different LMS (Moodle and Blackboard (WebCT) Vista). This course was modelled in ^{edu}WEAVER. Both LMS support the standard SCORM. In figure 6 it is clarified that ^{edu}WEAVER is able to export courses in both or even more LMS. Why is the independency from LMS so important for ^{edu}WEAVER? The following scenario should give an answer to this question and reflects the motivation of the developers of ^{edu}WEAVER:

A University acquired the license for a commercial LMS and teachers and lecturers used this system to offer courses for their students. The number of students has constantly risen and so the use of learning management systems is essential. The lecturers began to structure their courses for offering prepared didactical learning materials available and to give an additional motivation for studying. After three years the license of the LMS expired and the responsible persons decided to change to another platform. Now lecturers have to handle the new challenge to transfer existing courses into the new platform. Unfortunately, the generated courses have got no standard and so there is no possibility to transfer existing courses into the new system. Because of the change to another learning platform, lecturers have to create and design new courses for making them available in the new learning management system.

This example underlines the importance of the independency from learning platforms. If lecturers have had the possibility to create their courses in ^{edu}WEAVER, it would have been possible to export them as SCORM packages and import them in the new learning management system. So it would have been possible to publish the course with a minimum on investment.

3.3   *The personalised approach*

The course structure and the learning object pool in ^{edu}WEAVER are potentially available and useable for all users from ^{edu}WEAVER. The basis for the development of a pool of learning objects, which are available for everyone, was the idea of sharing learning objects and the corresponding course structures. So it is possible to save time during the planning and modelling of teaching and learning processes and eventually also during the creation of learning objects.

You want to change the expiration of your course, but have no idea how to do it? Just look what your colleagues do
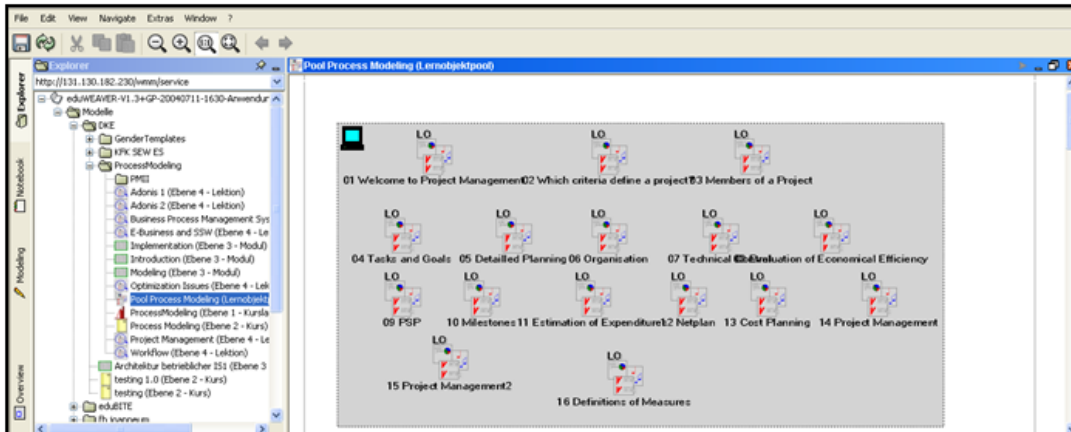
Figure 7 - eduWEAVER surface of a learning object pool

Figure 7 shows the surface in ^{edu}WEAVER, how it is seen by every user. This figure shows a learning object pool. Each user has access to the learning object pool with the explorer on the left side. Learning objects can be used by everyone after the agreement of the creator. Just the original designer is able to accomplish changes on learning objects. The same applies to modelled course structures.

3.4 Flexibility

Flexibility in ^{edu}WEAVER is ensured through the above mentioned points, like structure, reusability, independency and the personalised approach. Due to these features, ^{edu}WEAVER is able to ensure flexibility to the user (within the addressed areas). If it is needed, teaching and learning materials can be split up into learning objects and can offer different file formats. The user has many possibilities in the course of the design of learning objects. The addressed reusability enables a high measure of flexibility in the selection of the learning management system. With one and the same course you can use several LMS or a change can be done without hurdles. The fact that the majority of LMS supports the SCORM standard and that ^{edu}WEAVER exports its files in a SCORM-package makes this tool so flexible.

^{edu}WEAVER is a web-based tool and this means that it is available through a web-service. So the Internet is the only requirement, in order to work with ^{edu}WEAVER. Users are independent in terms of time and place as long as they have got access to the Internet.

Flexibility in applications together with the change of your courses

4 Approach and methodology

Instructional Design is a concept that stems originally from American sciences literature and is engaged with production of teaching and learning process as far as ^{edu}WEAVER supports it [Klein00]. Planning, concept, performance and evaluation are important points in the instructional design of teaching and learning processes. The support of ^{edu}WEAVER in terms of didactical formats of learning materials in form of learning objects and the course structures in form of different models makes didactical design possible. This is very important for motivating students to use the Internet as a medium. If the didactical component is missing, the learning success can not be achieved [Klein00].
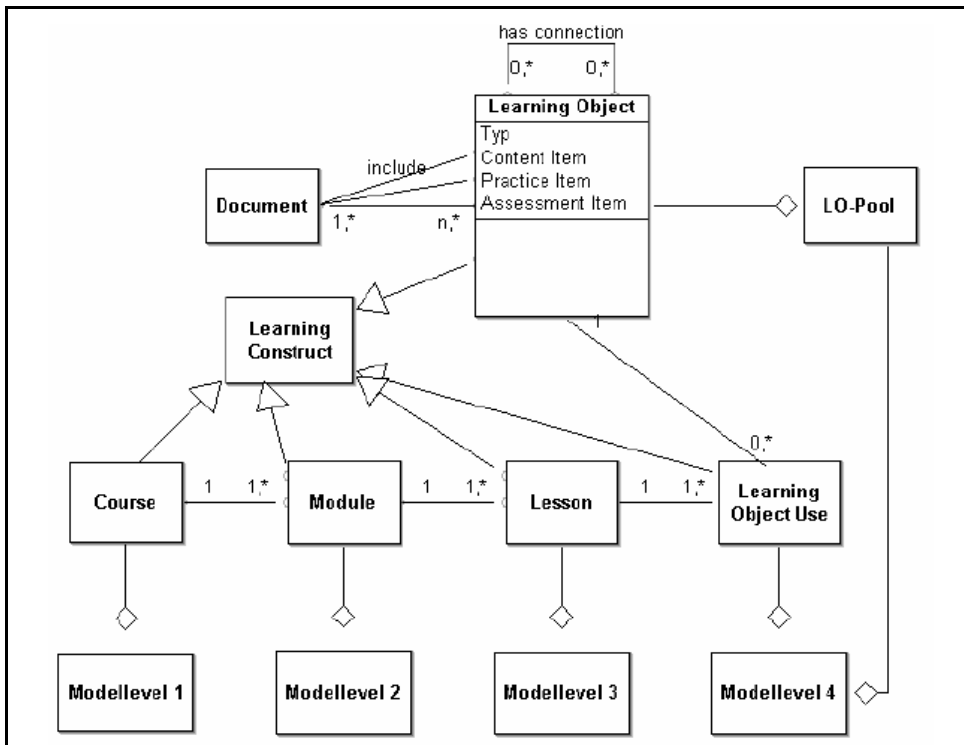
Figure 8 – Simplified metamodel from eduWEAVER

The method used here is based on the metamodelling platform ADVISOR®
[BOC]. Metamodelling means describing a scenario with the end of a
common valid language or modelling approach. Thus metamodels describe
how models are build up[10]. In figure 8 you can see a simplified metamodel
that represents the basis of ^{edu}WEAVER. Each created model includes
learning activities that correspond to the respective level. The model types
are connected through references. From the fourth level the designer is able
to directly access the learning object pool, where all multimedia learning
materials are stored[11].
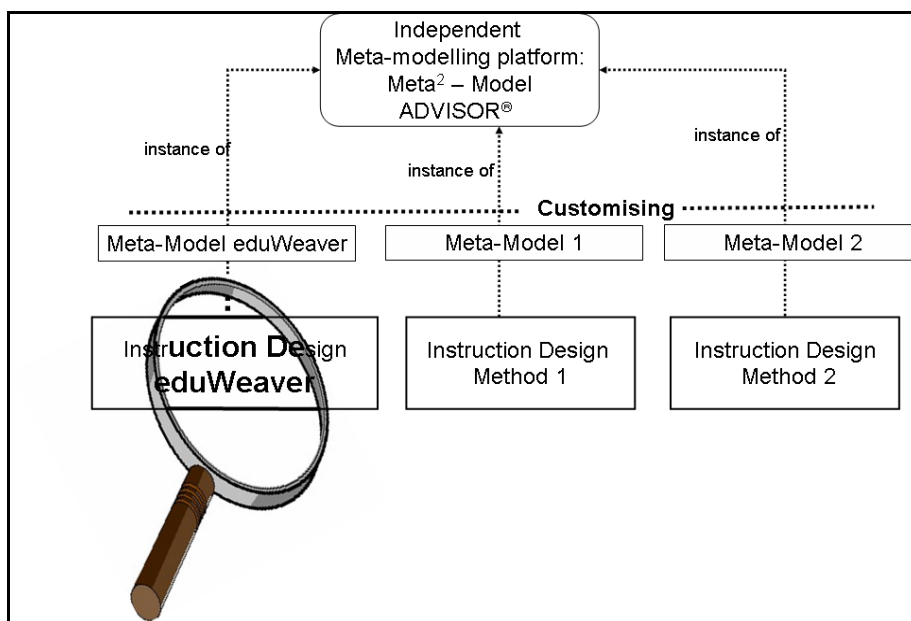
Figure 9 – Advisor® and eduWEAVER

ADVISOR® is a process modelling platform that supports the usage of
common or newly defined modelling methods. Figure 9 shows that
^{edu}WEAVER builds up on ADVISOR® and makes it possible for the user to
apply functions of the corresponding metamodel on a graphical surface.

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[10] Prof. Karagiannis documents

[11] Karagiannis, D., Kühn, H. (2002): Metamodelling Platforms

5 The ᵉᵈᵘWEAVER standard operating procedure

ᵉᵈᵘWEAVER offers you three possibilities of modelling described in the following chapters:

5.1 Top down modelling

If you want to

- design completely new courses,
- but have a detailed structure (for example curriculum, term planning, …)
- and have all your learning materials (slides, scripts, online-resources, …),

then the best modelling type will be the *Top down modelling*.
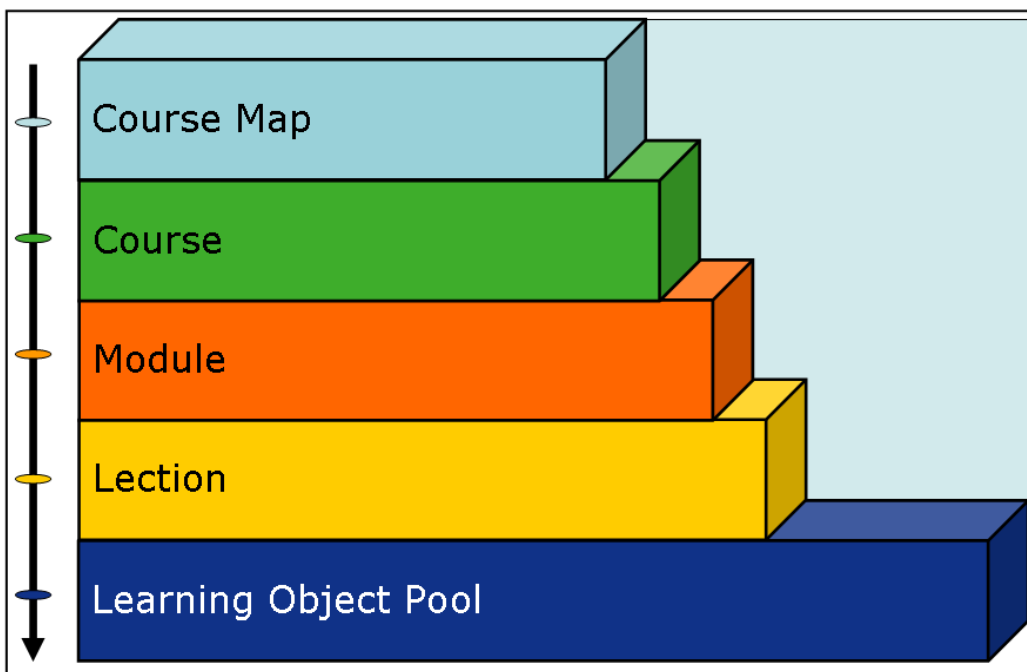
Figure 10 – Top down modelling

At first you build your course map with all courses. After that you decide how the courses are structured. The next step is structuring together models on the time level (weekly lectures, deadlines for seminars, etc.) and to create separate lections. The last step is to graphically design which learning objects (slides, scripts, online-resources, etc.) will be used in the

several lections. After finishing the modelling you simply put the corresponding resources into the learning object pool.

5.2 Bottom up modelling

If you want to

• design completely new courses,

• but do not have a detailed structure and relating content (for example design a new course),

• but your learning resources are already available (slides, online-resources, etc.),

then the *Bottom up modelling* is the best method for you.
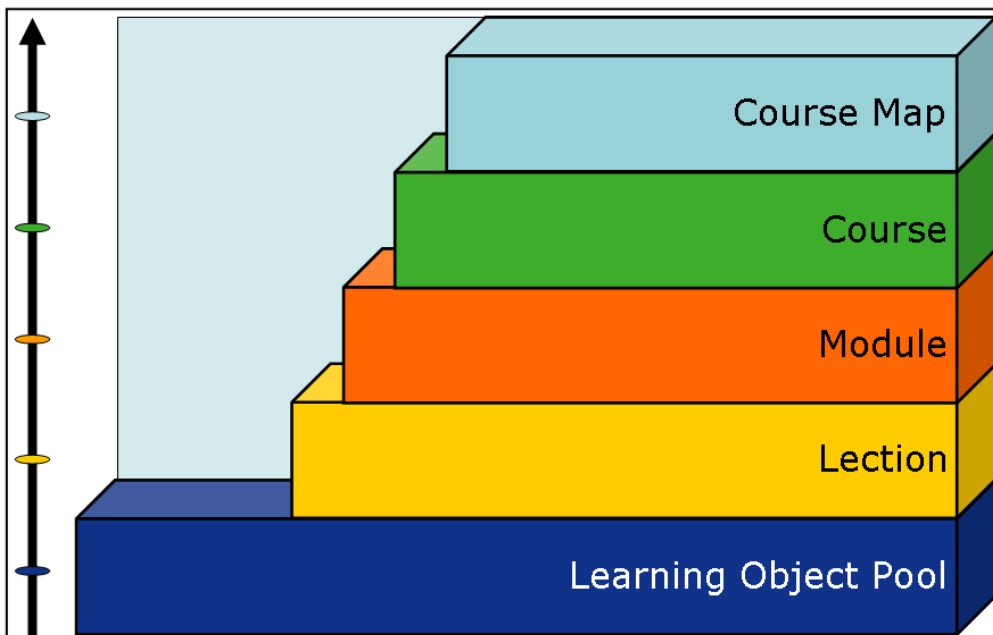
Figure 11 – Bottom up modelling

The first step is to put your learning objects (slides, scripts, online-resources, etc.) into the learning object pool. The next step is to merge multiple learning objects by creating a lection (a course unit). This lection has a certain subject and will be supported by the learning materials. This step should be repeated until all required learning materials are embedded. Finally, it is possible to merge all belonging lections to a module. A module describes a big part inside your course. You can repeat this step until all lections are embedded in modules. After finishing this working step, it is

possible to combine modules into a course and thus your course is finished. You can repeat those three steps (lection, module, course), until you have designed all required courses. The last step is then to merge your courses into a course map.

5.3 Achieving with modelling

If you want to

- design a new course,
- but you do not have a detailed structure
- and/or have no learning materials (slides, scripts, online-resources, etc.)
- and you roughly know, what will happen during your course,
- and you want to hark back on the knowledge of another academy,

then the procedure "model of reusage" is the best for you.

Now you start on the course map level, where you define your course. The next step is then to decide how much you want to create from scratch and how much you want to hark back on course parts from other academies.[12]

Figure 12 - Reusage

Applying released courses from your colleagues

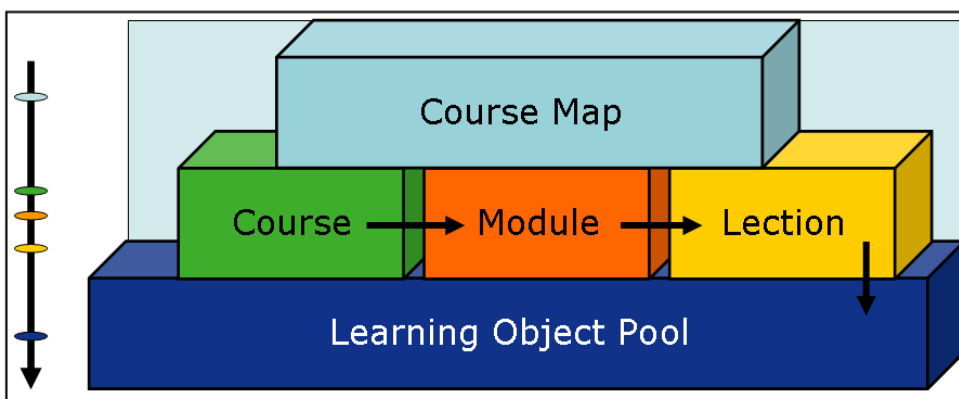[12] Compare for example with Motschnig-Pitrik (2006): Web-Technologie begegnet personzentriertem Lernen

• If you want to reuse whole courses, you just have to look for them and embed them into your course map. For this possibility all models, lections and learning objects are reused like they were built.

• If you want to thematically structure your course on your own, then you have to do it on the course level. After that you can look for adequate modules and reuse them within the created lection and learning objects.

• If you also want to design the structure of several courses (splitting up a thematically module in a learning unit), then you can do that on the module level. There you have the possibility to search for adequate lections.

• If you want to design the whole course and the lections on your own, you have the possibility to search learning objects in the learning object pool and integrate them into your course.

With the user manual[13] on our web page you can read step by step how to put these modelling steps into practice with ^{edu}WEAVER. In the following tutorial, you may get an overview of the practical procedure in terms of the creation of courses.

6 Tutorial

^{edu}WEAVER is a web-based Courseware Design Tool that can be reached easily over the Internet. All you need is an Internet browser. If you type in http://tool.eduweaver.net into you address line in your browser, you are directly redirected to ^{edu}WEAVER. Automatically, a dialogue box pops up, where you should enter both your user name as well as your password (if you have not received both yet, please contact support@eduweaver.net, where the ^{edu}WEAVER support team will gladly set up a user account for you). For approving your user account, please click on the button "OK". If your user name and password are correct, you will be directed to the ^{edu}WEAVER user interface.

If you have no access, please contact us and you will get an absolutely free access

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[13] http://www.eduweaver.net/eduWeaver_Benutzerhandbuch.pdf
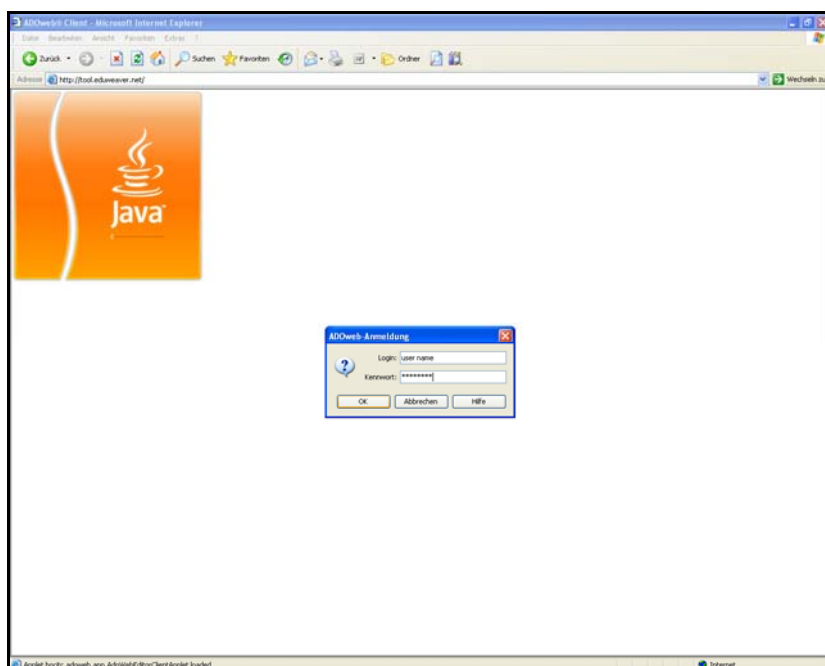
Figure 13 – Startpage on tool.eduweaver.net

The Userinterface of ^{edu}WEAVER

The user interface of ^{edu}WEAVER is splitted into four main areas:

• The menu area at the top of the page containing general Windows-like menu points, such as "Data", "Extras", or the like,

• the components menu at the very left of your screen covering the three available components in ^{edu}WEAVER, "Explorer", "Notebook", and "Modeling",

• the action menu, where per default the file system is depics/picted, whereas this changes according to your current selection in the components menu, and finally,

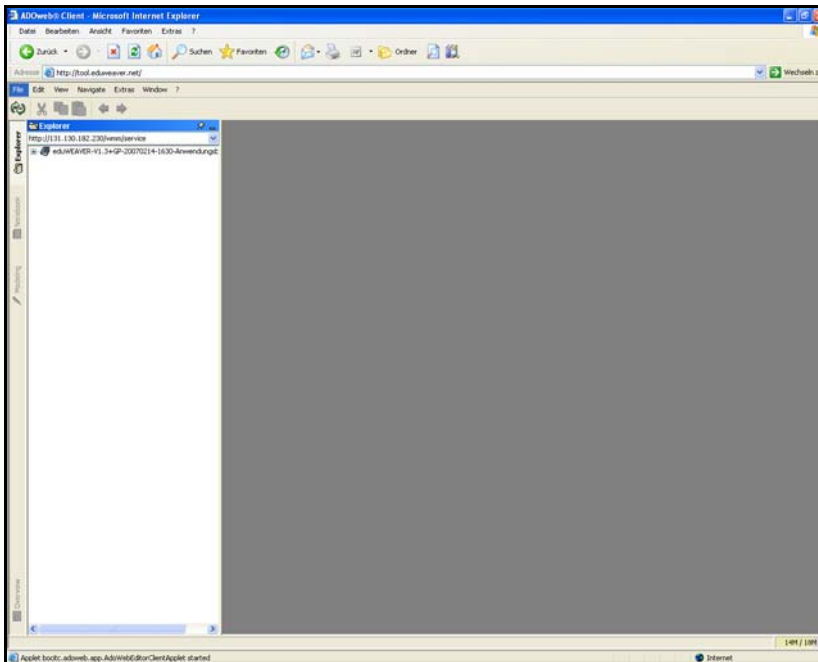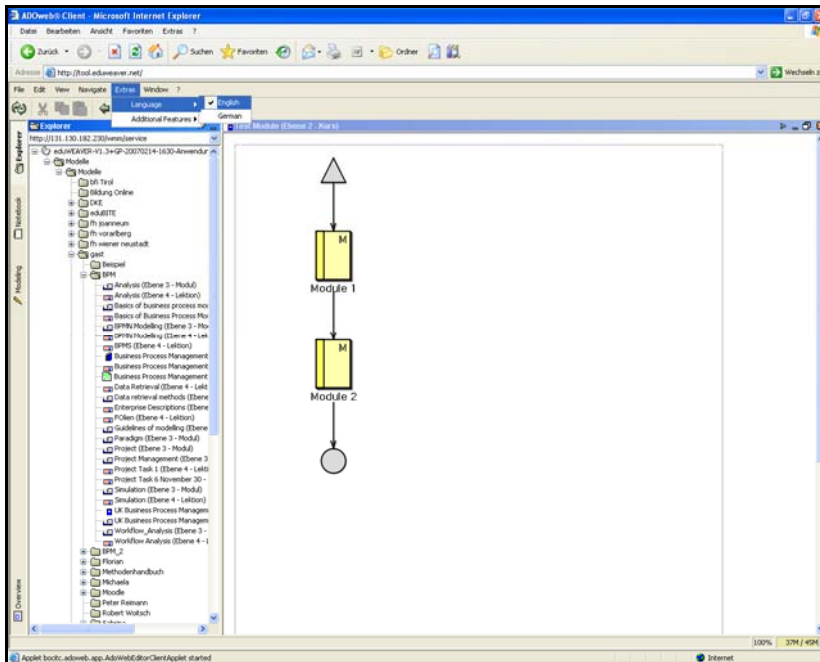• the modelling area, where you can design your courses at all levels.

Figure 14 - Userinterface

The Menu Area

Here, general settings, such as the change of language from English to German (menu point "Extras" choose "Language") can be made.

The ^eduWEAVER-menu can be displayed in German or English

Figure 15 – A cut of the menu area

The Components and Actions Menu

The components menu assists you in your current tasks. It offers you handling your course design and administration at all stages with litte effort. Depending on what you are currently working on, you should choose the correct component for your task:

• Explorer component: All your courses are displayed in the file system to the right of the component menu. By choosing the explorer component you have an overview on all your designed courses.

• Modeling component: If you plan to design a new course or to redesign one of your existing courses, please select the modeling component. The afore-mentioned view on the file system is replaced by the available modeling objects for your current design task.

• Notebook component: As soon as you want to enter data into one of your existing courses or also in the course of the design of a new course, please

choose the notebook component. Depending on what design object within your course you have pointed to, diverse input fields are visualised, where you may enter your desired values.
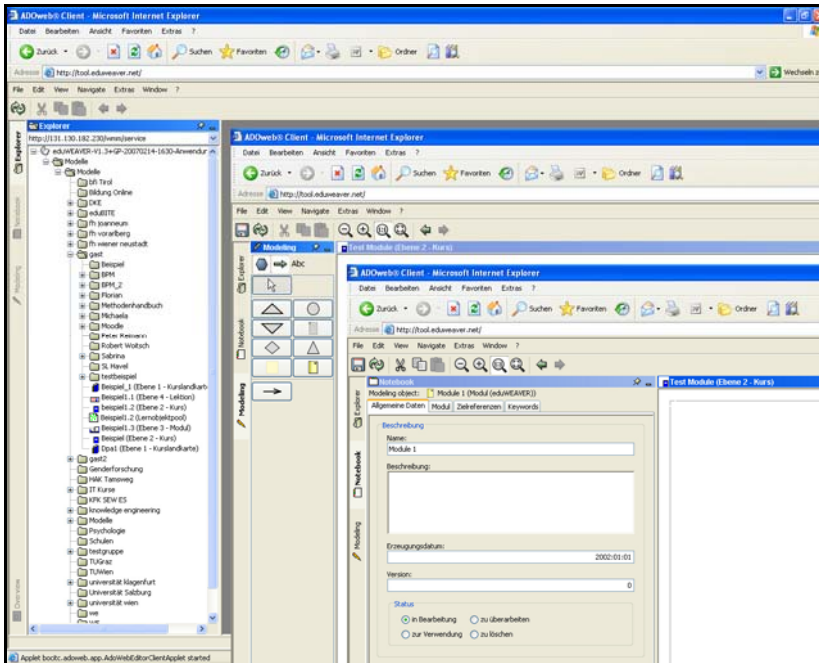

Figure 16 – Function area

The Modeling Area

This is the drawing area where you can design and redesign your courses. By choosing an object from the modeling component you may easily drag and drop the object's symbol into the modeling area. Additionally, you can change the structure and flow of your existing courses by simply clicking on the desired object and eventually moving it to a new place in the modeling area.
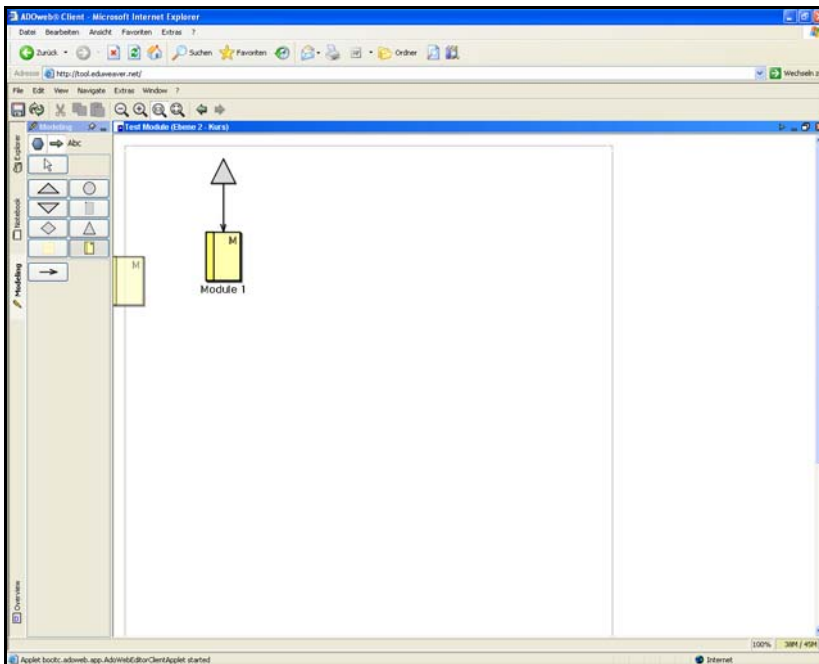

Figure 17 – The modelling area

The Model Levels in ^{edu}WEAVER

^{edu}WEAVER provides a five level system for course design that allows both an intuitive design and redesign of courses and also a multiple usage of existing parts of courses in diverse course settings. These five levels are:

Modularity is attained by strictly separated levels

- Level 1 - Course Map,
- Level 2 - Course Model,
- Level 3 - Module Model,
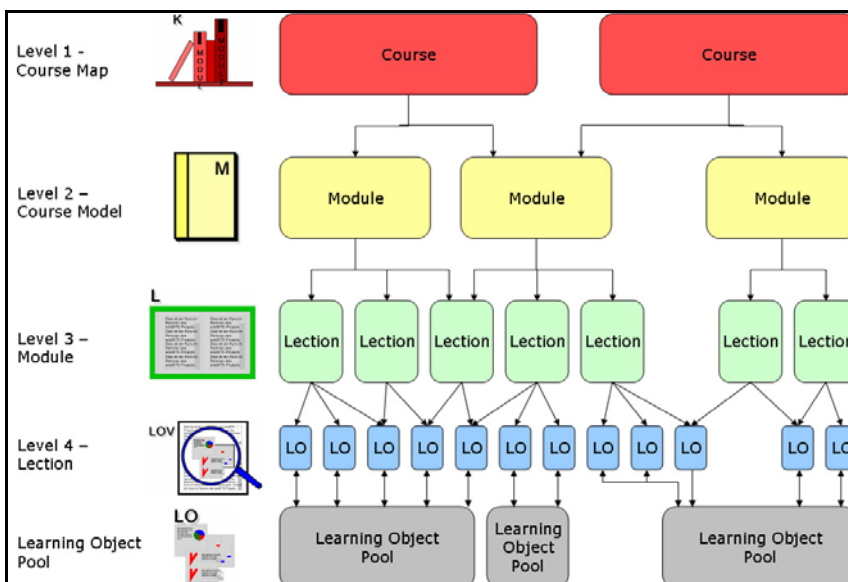- Level 4 - Lection Model, and a
- Learning Object Pool.

Figure 18 – The five model levels

Level 1 - Course Map

The Course Map provides an overview of your offered courses.

For creating a course map, please click on your directory with the right mouse button in the file system. A menu opens, where you should select "New" and "Model". In the pop up window, you eventually may choose the model type you are intending to create. In this case, you should go for "Kurslandkarte" (Course Map). Now you can model your courses, by clicking on "Modeling" in the components menu.

Please place one course item per offered course on the modeling area. Additonally, you can name your course and add detailed information to all your courses (by double-clicking on a specified course item, the notebook opens in the actions menu). Furthermore, by using the aggregation object (the rectangular grey modeling object), you can group specific course items to one larger cluster, as for example all courses that you give at a certain school, or all courses of complexity level 2, and so forth.

Finally, by double-clicking on a certain course item and choosing course in the notebook, you may reference directly to a course model, where you can specify your course according to the construct of modules.

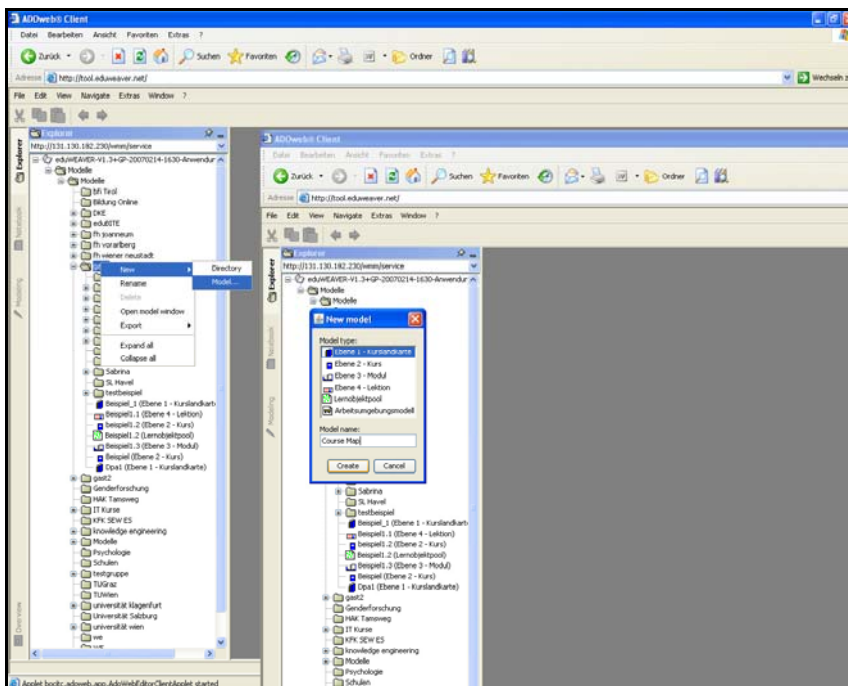*For gaining a first overview: using the course map*

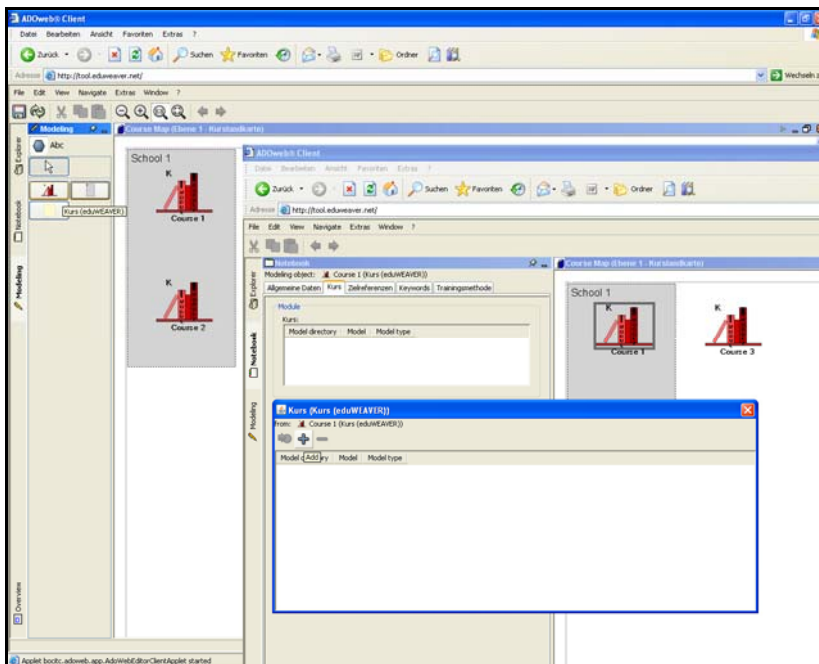**Figure 19 – Pop up window: new model level**

Figure 20 – Course definition

Level 2 - Course Model

Level 2 - the Course Model (not to be confused with the Course Map that is actually assigned to level 1) offers you the possibility of specifying your courses according to so-called modules. These are units that cover one certain topics/pic in the course of one of your courses, as for instance "Ancient World" as part of your history classes. You may place 1 up to n modules within your course, whereas you can also arrange the module objects according to your preference by starting with a start symbol (grey triangle), placing all your modules in a certain sequence, and let your course end by choosing the end symbol (grey circle). All objects should be connected with the arrow that is available in the actions menu by clicking on the modelling component. Again, by double-clicking on a certain module item and choosing module in the notebook, you may reference directly to a module model, where you can further specify your module according to the construct of lections.

Split up your roughly structured courses into thematically similar modules
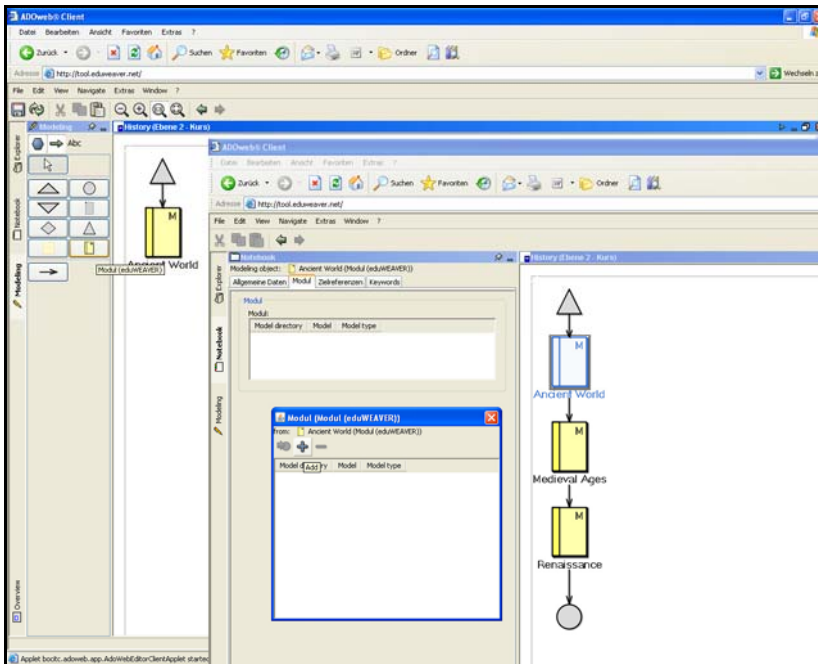
Figure 21 – Modules combined to one course

Level 3 - Module Model

Imagine you want to plan your module "Ancient World" in your course "History" even more specifically. You should then split the module into so-called "Lections", pieces that can be taught within one certain unit on a specific day (e.g. the 1.5 hours course in week 2, i.e. January 10). One module may contain 1 up to n lections, whereas the only constraint you should consider is the lections length according to a certain unit (as indicated two lines above). Hence, further imagine that you will treat the "Ancient World" section in your course "History" in three weeks, whereas every Tuesday from 6 - 7.30 p.m. you meet with your class. You could then specify three lections, as for instance "Egyptian High Culture", "Greek's Culture", and "Roman's Culture". Again, by double-clicking on a certain lection item and choosing learning object in the notebook, you may reference directly to a lection model, where you can further specify your lection according to the construct of learning objects, i.e. atomic and reusable small constructs.

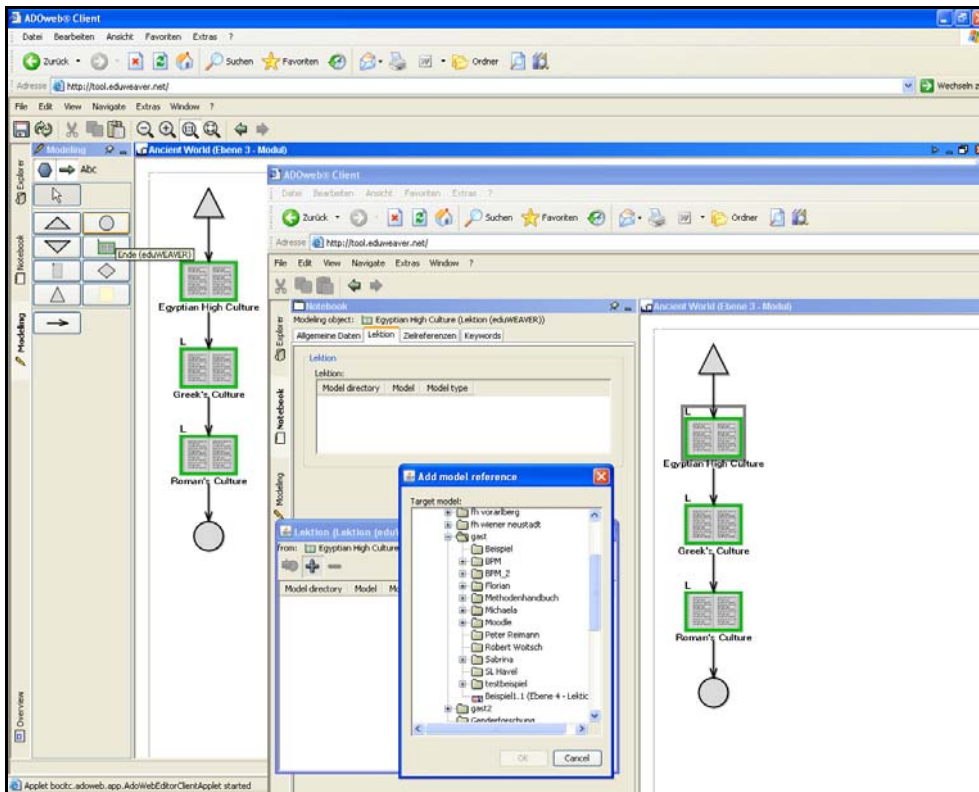*Determine here individual lections that you want to use in your module*

Figure 22 – Lections combined to one module

Level 4 - Lections Model

When referring to the lection "Roman's Culture" you may want to plan the unit with its length of 90 minutes (see above in section Level 3 - Module Model). In fact, what you can do is organising your course by defining so-called Learning Objects. These are atomic structures that define properly a part of a lection. In the case of the Lection "Roman's Culture" this may be for instance three learning objects, entitled "Etruscian Times", "Roman Republic", and "Roman Emperors". The only conditition when assigning learning objects to one of your lections is the time frame, as a lection is coupled in length to one unit (in the above-given example 90 minutes). The main advantage of the learning object structure is its reusability due to its modular and encapsulated structure. Thus, learning objects represent self-contained course materials that can be applied in various course settings. Imagine that for instance you are giving another history class, where a unit has got a length of 45 minutes only, but in contrast to your

first history class, you may take up to 7 units for the module "Ancient World". Hence, you may rely on some of your already existing learning objects and add some new ones or borrow some from your colleagues (certainly only, if they have agreed on the sharing). You can easily link again your learning objects from 1 to n Learning Object Pools.
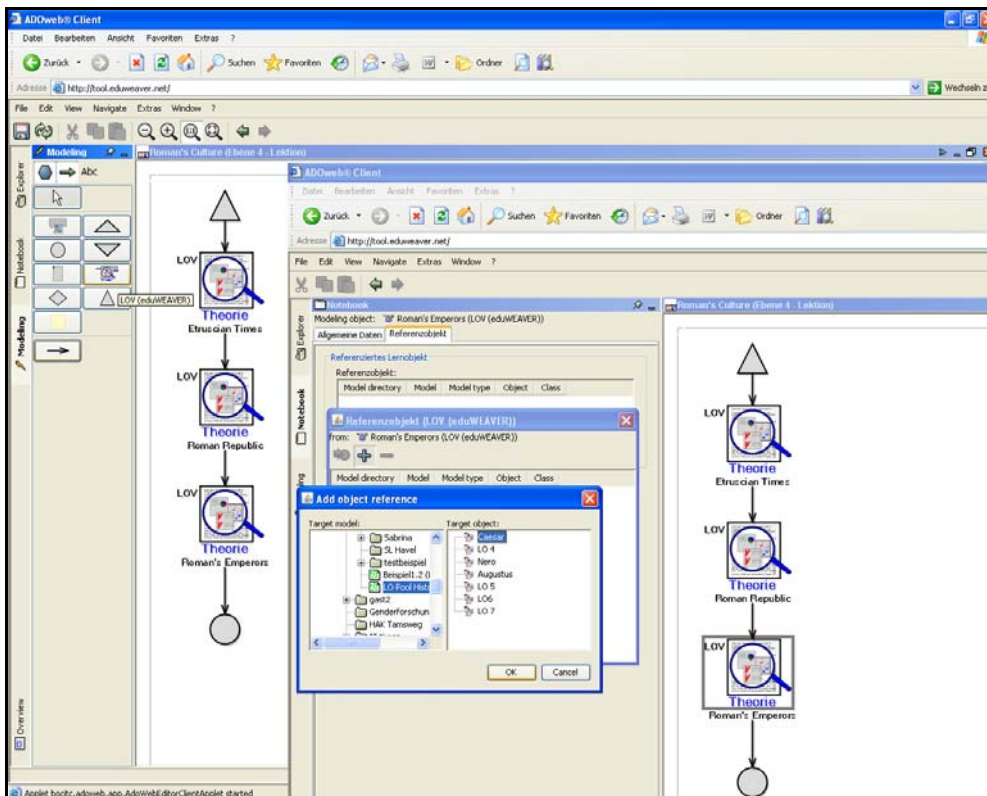

Figure 23 – Lections are made up of learning objects

Learning Object Pool

The Learning Object Pool represents the repository of your course materials. Like file cards, you can use your learning objects as often as you want - even simultaneously in diverse courses. You can also maintain your course materials as often as you want without affecting your current courses that you are giving. Additionally, and only if you wish, you could share your learning objects with other lecturers and vice versa, by allowing others to use your learning objects in their courses. Additionally, you could directly link your specific course materials to each learning object. Hence, in fact, you have your course materials everywhere you go - just log on to ᵉᵈᵘWEAVER and open your models!

Learning objects can be used in several courses
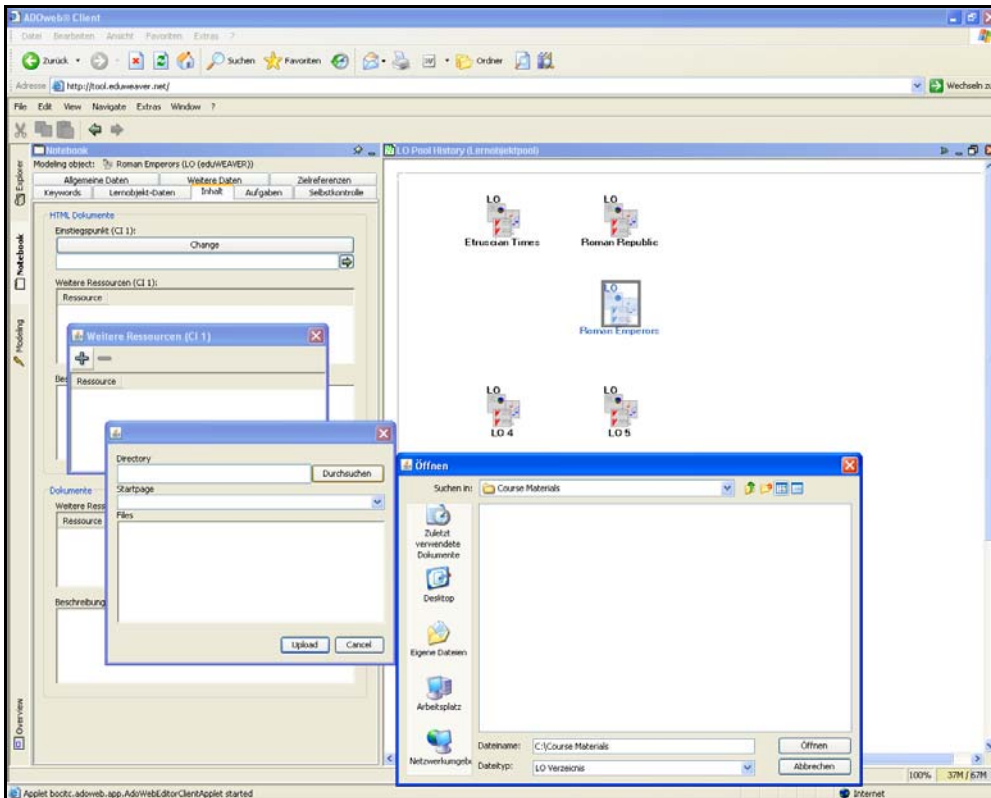
Release them for other colleagues

Figure 24 – Link course materials with learning objects

Export your Models and Course Materials to a LMS

^eduWEAVER^ is your area. Students normally cannot access your course materials. But anyway, some of your course materials may be considered for being accessible for students (slides, documents, internet links, videos, etc.). Thus, the easiest thing is to export your desired course materials to one of the various existing Learning Management Systems (LMS), platforms, where you can easily distribute the course materials to students, when, how and what you consider to be adequate. ^eduWEAVER^ supports various standards for exporting into LMS, as for instance, SCORM 1.2, SCORM 2004, XML, and so forth. The export functionality is really simple. Double-click with the right mouse button on the desired model (choose e.g. the Course Model "History") and choose "Export". You finally have to click on the desired export standard (most of all existing LMS support SCORM, hence that is the standard you normally should choose). If the export is finished, you proceed to your LMS and import the file.

As the last step you make your course available for your participants – insert your course into a LMS
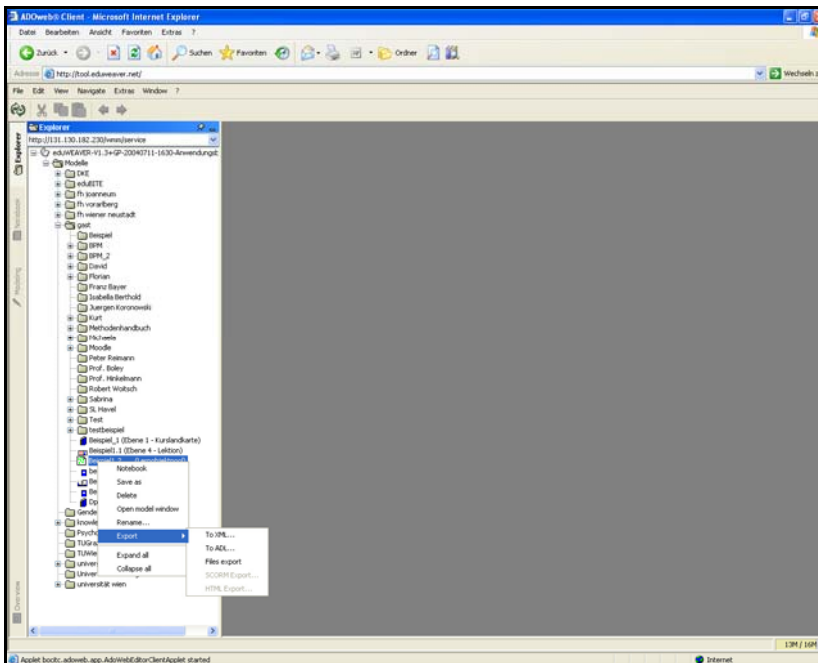

Figure 25 – Export in your chosen standard

We hope that you enjoy ^eduWEAVER^!

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8   eduBITE

Project duration: November 2002 – April 2008 (incl. maintenance phase)

The method and the web based "Instructor Management Tool" ᵉᵈᵘWEAVER were both developed and conceived in the course of the ᵉᵈᵘBITE –project. ᵉᵈᵘBITE (Project number: 43) is supported by the Federal Ministry of Science and Research in the course of the initiative "Neue Medien in der Lehre" (NML).

The goals of the ᵉᵈᵘBITE –project are:

- To support lecturers and students in the area of Business Informatics with multimedia-based teaching and learning material. This should allow procuring knowledge and skills in the area of integrated operating information systems
- To develop instruments for flexible configurations of course units based on existing learning objects
- To create an organisational framework for the use, extension, and improvement of learning objects within the subject "integrated operating information systems".

The main focus of the development of teaching and learning contents rests on the reusability and the simple extensibility of knowledge objects. These objects may be conceived after media-didactical guidelines and configured flexible to courses.

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