



University of Zurich



OLAT 6 - Functional Survey

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OLAT 6 - Functional Survey

OLAT means "Online Learning And Training" and is a web-based Learning Management System (LMS). This software has been developed at the University of Zurich from 1999 on and is used there as a strategic LMS ever since. Given that the Apache 2.0 open-source license is respected, the software may be used at no charge and modified according to the users' needs.

OLAT has been developed with regard to its use on campus in a heterogeneous environment. As a result of this wide range of requirements OLAT offers a high-grade modular architecture that is easily adaptable as well as upgradeable. OLAT furthermore supports common e-learning standards such as IMS Content Packaging (IMS-CP), IMS-QTI or SCORM.

The LMS OLAT comprises a flexible course system in addition to various course independent features. These features include in particular a general management of learning resources such as cataloguing or the provision of editing tools for tests, questionnaires and courses.

Further important aspects of OLAT are the following:

- Support of collaborative group work
- Groupware tools such as discussion forum, chat, calendar, Wiki, e-mail forms and repositories
- Didactic freedom within the course system using flexibly the following course elements: structure, single page, external page, Wiki, IMS-CP and SCORM learning content, test, self-test, questionnaire, assessment, task, file dialog, enrolment, contact form, forum, and folder
- Notification service via e-mail or RSS
- Personalised interface that is easy to use
- Multilingual user guidance (German, French, Italian, English, and a lot more)
- Connection to external information systems such as SWITCH AAI (Shibboleth)

In this document the most important features of OLAT 6.x are introduced. The list above is not exhaustive, however, it serves to provide an insight into the functionality of the LMS OLAT.

1. Administration

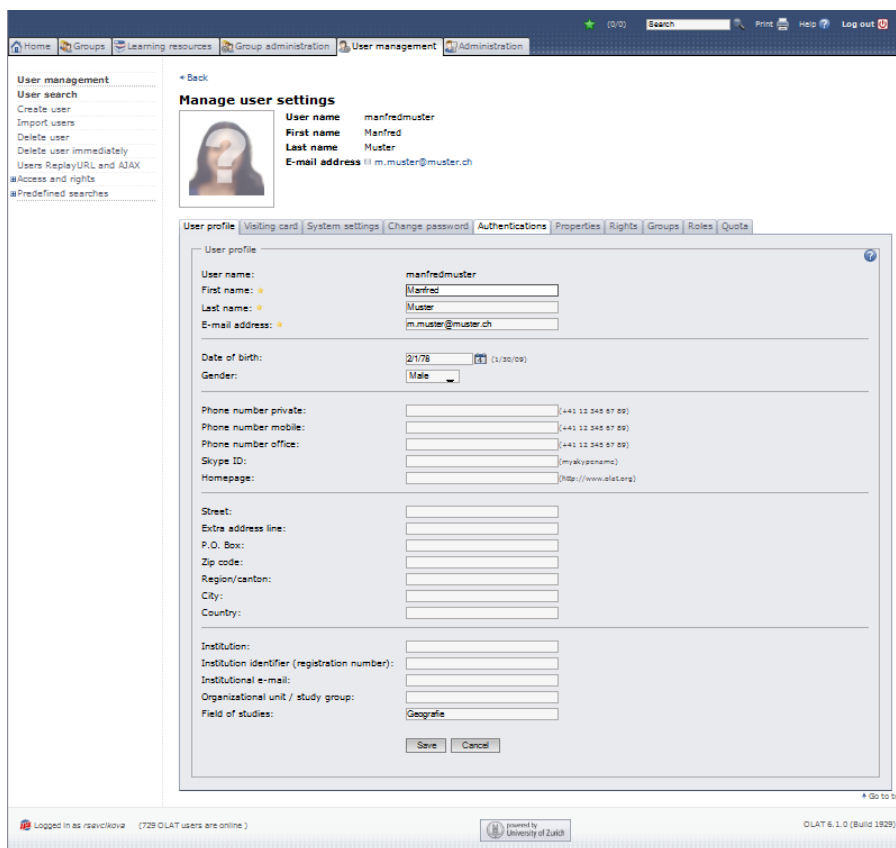
1.1. User Management

User Registration

Authorised persons may register either a single user manually or more users at once by means of Excel files import. If a connection to external systems via Shibboleth protocol (an Internet2 standard regarding shared authentication and authorisation) is used, users do not have to be enrolled manually. Instead they will be registered automatically during their first login. Further integration possibilities such as LDAP are easily implemented.

Users dispose of different configuration options, a profile as well as the allocation to system roles. A search form allows to look for users within the system and edit their data afterwards.

Users who have not logged in for a predefined period of time can be deleted automatically.



User management: administration of users

OLAT System Roles

OLAT is a system based on rights and provided with several hierarchy levels. Users have those functions at their disposal they are authorised to in a given context. In OLAT the following system roles are distinguished:

Guests: They are anonymous users with only limited rights. Guests can neither adapt their user interface nor take a test nor contribute a forum entry.

Users: OLAT users can adapt their user interface according to their personal needs as well as create work groups or start a course as participant.

Authors: They can create, copy, archive or delete learning resources in addition to the rights ordinary users have.

Group Administrators: In addition to the rights of ordinary users, members of this system role can manage learning or right groups.

User Administrators: They can generate or import new users and allocate roles.

Administrators: They are entitled to implement administrative activities regarding the entire OLAT system in addition to the rights of all other system roles.

1.2. System Administration

System Information

Administrators have access to all technical information regarding the system; they have access to the list of users online along with their precise session data; they can also consult problem reports.

System reports can easily be communicated within the entire system, e.g., in order to inform users of an upcoming server maintenance or to point to new features.

Quota Management

The OLAT folder concept used throughout the system holds limited storage capacity (quota). Administrators can modify this quota for each folder according to the users' needs.

Translation Tool

By means of the Online Translation Tool texts of the OLAT user interface can be modified easily. Furthermore, new languages may be added to that tool.

Notifications

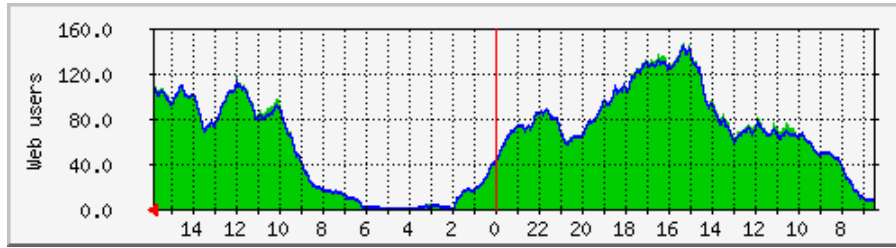
Every night OLAT sends an e-mail with event and news notifications to the subscribers. Administrators can also send such notifications individually.

Full-Text Search

The administration page of the full-text search gives information on the current state as well as on parameters such as index size, indexing interval or amount of queries. Usually the index is automatically updated within a predefined interval that is configurable. It may, however, be also updated manually any time.

Monitoring

The so-called monitoring serves to check critical values within the system such as number of users online, CPU load, memory within the Java VM, memory regarding the operating system, number of users and courses, number of queries processed simultaneously or network availability. If predefined limits are exceeded, an alarm e-mail is triggered.



Display of how many users are currently logged in

Monitoring is not a feature of OLAT itself but an external tool to be installed on the server.

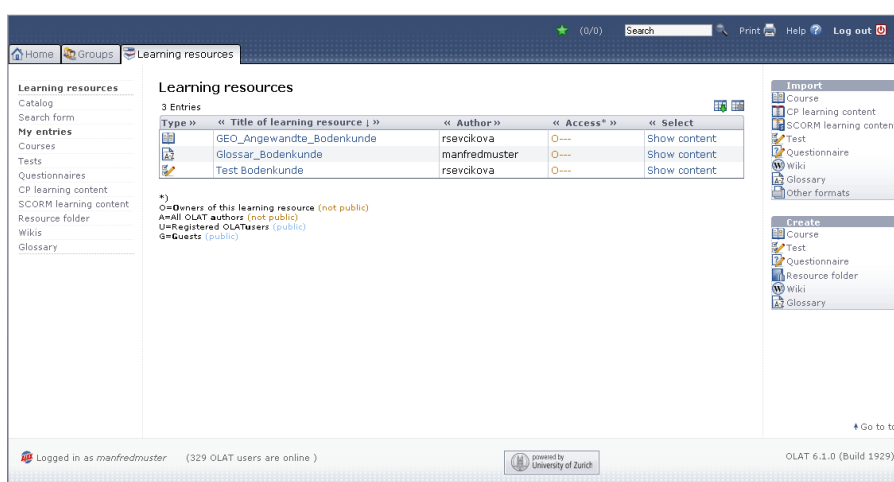
2. Learning Resources

2.1. Repository

In the repository of learning resources authors create courses, tests or questionnaires. Moreover, they can upload standardised learning contents (e.g. IMS Content Packaging or SCORM). Other learning resources are wikis, glossaries and resource folders for documents which can be integrated in several courses.

The access to learning resources is controlled by access rights. Depending on the chosen settings, either owners of the resource or system authors or all registered users can get access. Another option is unlimited access--even for guests.

All learning resources contain meta data (such as name, author, description, type) that can be searched for specifically.



Repository of learning resources: display of My Entries

Learning resources that have not been used for a predefined period of time can be deleted by administrators.

2.2. Catalogue

The catalogue displays the given organisational structure. Authors integrate those learning resources to which users have access into the catalogue's structure at the adequate place.

A well built and tended catalogue mirrors the courses offered on campus and can therefore substitute an ordinary university calendar or site map. It can also be used to represent a syllabus or curriculum.

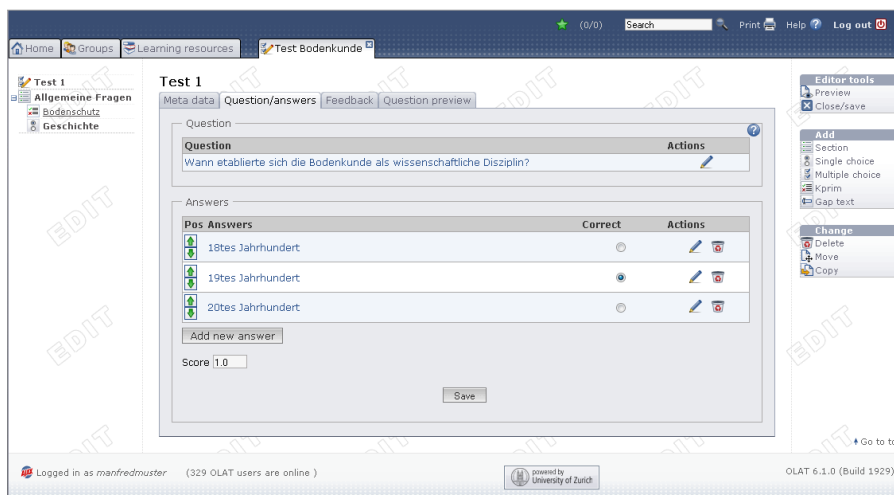
2.3. Import/Export

Learning resources can be exported and re-imported into another OLAT installation. This mechanism allows for the creation of general course templates that can be exchanged among course authors.

2.4. Test Editor

With the integrated test editor even complex tests or self-tests can be created. Because these tests and self-tests are saved in the standardised IMS-QTI format, they can be exported and used on other learning platforms. It is also possible to create tests by means of external tools or other learning platforms and import and use them in OLAT. Those other systems have to support the IMS-QTI standard version 1.2.1.

The internal editor allows the creation of questions such as single choice, multiple choice, gap text, and K-Prim along with feedback and hints. There are several options to configure repeatability, time limit and score. Questions and predefined answers can consist of text as well as of media files such as images or movies.



Editing single-choice questions within the test editor

Tests are created in the repository of the learning resources and can therefore be used in one or more courses as tests or self-tests. The detailed results are saved as text files and can be accessed by means of SPSS or Excel for further analysis.

2.5. Questionnaire Editor

The questionnaire editor is based on the test editor's technology. It allows you to create questions such as single choice, multiple choice, gap text and free text.

Questionnaires are created in the learning resources too and can thus be used in several courses. Their results will be saved as text files and can be accessed by means of SPSS or Excel for further analysis.

3. Course System

3.1. Course Editor

Concept

The course editor is based on modularity. A course author builds his/her hierarchical course structure on so-called course elements as well as on visibility and access restrictions; that structure should mirror the preferred didactic concept. By means of the given elements basic courses including some HTML pages, a few PDF files and a discussion forum are prepared as easily as complex courses to which, for instance, the access is depending on the reached score of a previously taken test. Further examples are role-playing, problem-based learning or group puzzles.

If a course will be edited, it is modified by means of a working copy of the course already saved. All modifications will be published selectively before granting access. A course can therefore be adapted and expanded during its term.

Learning Content

Whereas the course editor helps to define the course's structure and therefore the learning progress, the proper learning content is usually not prepared in OLAT itself. A WYSIWYG editor is used to generate HTML pages (TinyMCE), however, this editor is only meant for ordinary pages such as welcome pages. Entire scripts should be composed by means of an external editor (e.g. DreamWeaver). Another possibility is the employment of an external Content Management System (CMS) or of XML formats (eLML, Docbook etc.).

Traditional learning content consisting of texts and drawings without interactive elements such as Flash or JavaScript can be put at the participant's disposal via PDF files.

Course Elements

A course author can choose between the following course elements:

Content and Structuring

- Structure: structuring element (section, chapter, step, exercise) as well as scoring
- Single Page: ordinary HTML page, e.g., used for an introduction or a syllabus, etc.
- Folder: file repository
- CP and SCORM Learning Content: HTML formatted learning content (script); based on IMS-CP or SCORM
- External Learning Content: Learning content from another server (e.g. PHP picture database)

Assessment/Score

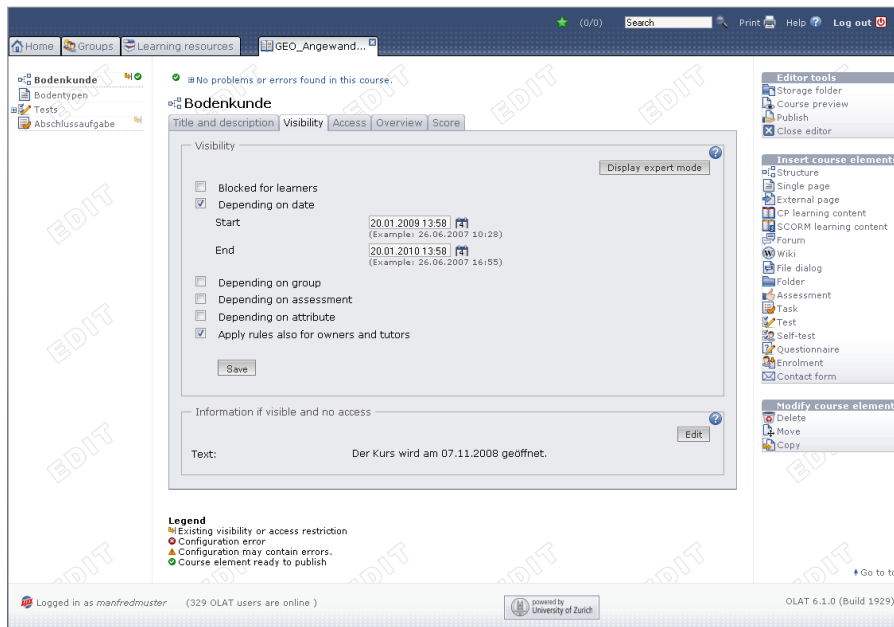
- Assessment: Manual assessment performed by coach (true/false, score, text)
- Test: Test or self-test based on the IMS-QTI format
- Questionnaire: Questionnaire based on the IMS-QTI format
- Task: Personal task combined with a drop box to hand in a participant's work along with sample solution and assessment

Collaboration

- Enrolment: self-dependent enrolment by participant along with optional wait list
- Forum: Discussion forum along with roles to be configured (read, write, moderate)
- File Dialog: Possibility to upload files and to offer a corresponding forum
- Folder: Exchange of files along with configurable roles (read, write)
- Contact Form: E-Mail form to get into contact with predefined persons
- Wiki: Collaborative tool to simplify the creation and linking of content; can be used as CMS/ knowledge management.

Visibility and Access Restrictions

By configuring restrictions regarding visibility and access the learning process can be controlled. Such restrictions can be either selective or a combined with certain dates, group membership, roles, scoring or specific user attributes.



Configuration of a visibility restriction combined with a certain date

Course Preview

In the course preview the user's view is simulated in order to be able to test the set restrictions in detail. The preview comprises the simulation of time, group membership, roles, as well as user attributes.

3.2. Course Administration

Authors have several tools at their disposal in order to manage an ongoing course and its participants. They can use these tools without any restrictions. Coaches of learning groups have access to those persons' data they are responsible for.

Group Management

The group management serves to administer learning groups within a course. Groups can be copied; all settings regarding collaborative tools will be adopted. Users can also get in touch with course participants and their coaches via e-mail.

The so-called learning areas serve to integrate groups of the same purpose, e.g., all those groups whose participants have to enrol for or all those groups whose participants have to carry out a collective task.

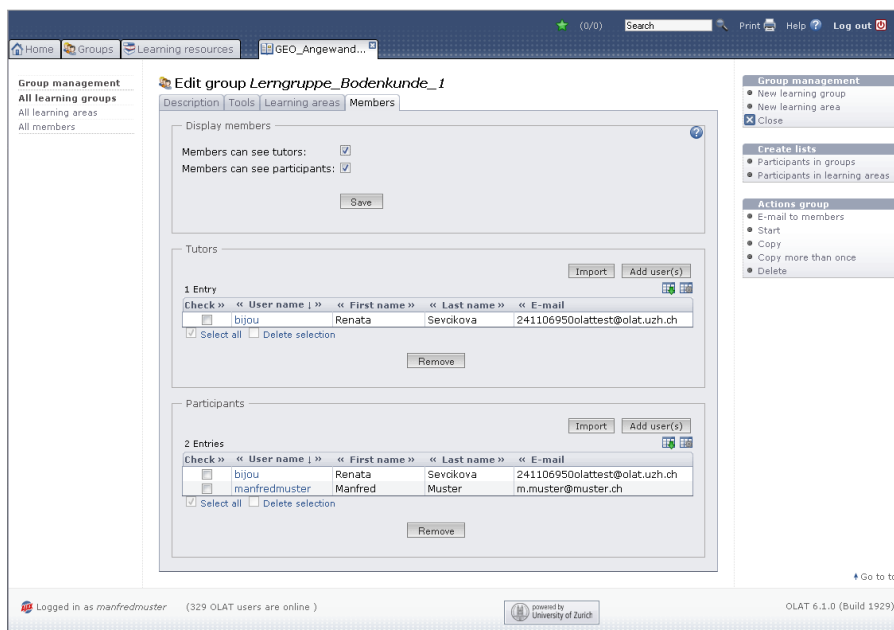
Using groups in conjunction with the course element "Enrolment" the maximum number of participants as well as an optional wait list can be configured. If a participant cancels his enrolment, the first person on the wait list will automatically be the next group member.

Within a course learning groups can be used for various reasons:

Administration: arrangement in groups or classes for administrative purposes such as participant's support, generation of attendance lists and assessment of participants by means of assessment tools.

Collaboration: arrangement in project groups with the same agenda. The main focus of collaborative processes is the learning target's promotion.

Further information regarding collaboration in groups is found in the chapter "[Collaboration](#)" [Page 14] .



Managing participants and coaches of one group

Rights Management

In order to grant certain people access to course tools authors have the option to create right groups. The appropriate course tools can be assigned to such right groups; members of that group are then able to use these tools (compare item "[Right Groups](#)" [Page 14]).

Data Archiving

Various course data can be stored in a personal folder by means of the so-called data archiving tool. These are in particular:

Test Results: Detailed data of tests in a course. These data can be analyzed further with Excel or SPSS.

Results of Self-Tests: Unlike tests these self-test data are anonymous and can be further processed by means of Excel or SPSS.

Results of Questionnaires: The detailed data of questionnaires in a course can be further processed using Excel or SPSS. The data is anonymous.

Course results: Overview of total scores per person in a course. All course elements needed to assess data (test, assessment, task) will be listed here. The gained results can be analyzed further with SPSS.

Log Files: A detailed log recording all administrative activities within a course as well as an anonymous user log is available.

Drop Box: Here all tasks of the corresponding course element that have been handed in can be uploaded as ZIP file.

Assessment Tool

The score of the course participants can be seen and edited with the assessment tool. According to the course elements' function there are additional assessment options available. When using the course element "Task", for instance, the coach will get access to the work handed in; when conducting a test the coach will get access to a detailed analysis of that test.

A log file serves to archive modifications regarding scores in order to get a high degree of transparency for coaches as well as participants; its history can be accessed any time. Assessments of an entire course can be downloaded by means of the data archiving tool.

Course Configuration

Settings regarding the entire course can be modified by means of course configurations:

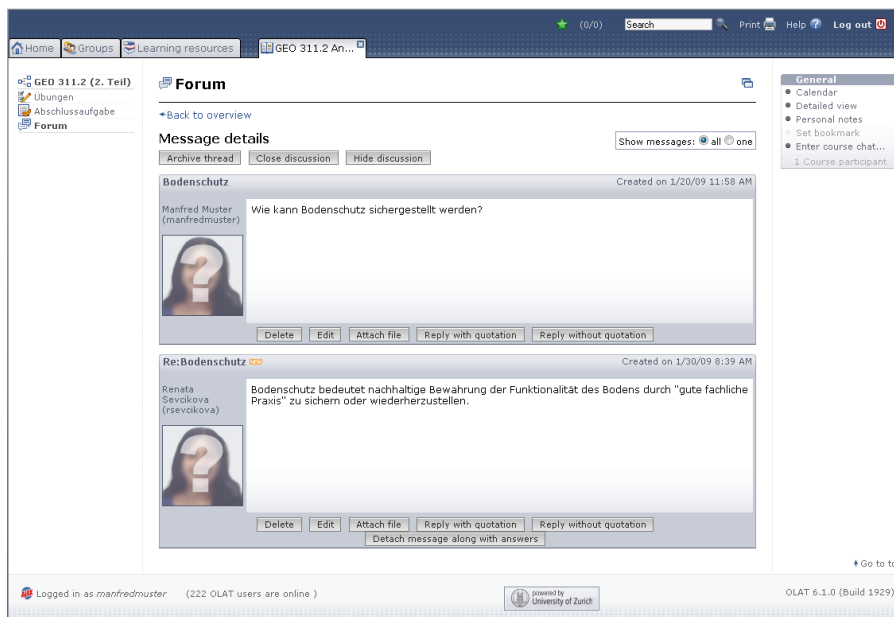
- Log Level: Level of detail concerning log messages
- Course Chat: Available/ not available (optional; only if Instant Messaging is installed)
- Layout: Selection of a specific CSS file meant for the course's display
- Glossary: Selection of a glossary to be used in several courses
- Resource Folder: Selection of a resource folder to be used in several courses
- Evidence of Achievement: Available/ not available
- Course Calendar: Available/ not available

3.3. Learning

Course Navigation

Course participants can find their learning resources in the learning resource's repository via search or via catalogue. After starting the course a new tab will appear in the top navigation; this tab allows to switch between that course and other areas.

The course menu serves to navigate within a course. This menu mirrors the course's structure considering any visibility or access restrictions. According to the course element's type different functionalities are available.



Display of course navigation and forum

Notes

Each participant can dispose of a personal memo per course. It will be opened in a separate window in order to be able to navigate within a course while writing a memo at the same time.

Bookmarks

Using bookmarks a faster access to a course is granted, since courses may be started from the personal bookmark list (section Home).

Evidence of Achievements

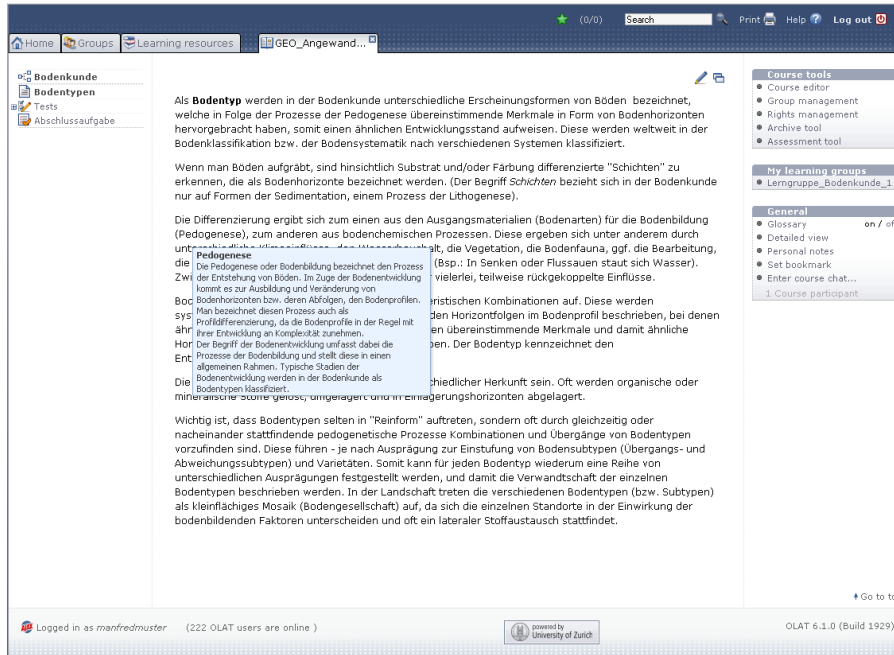
This evidence of achievements summarises the participant's personal progress. It is possible to determine via the course navigation if a participant should dispose of such evidence or not.

Chat

By using the course chat participants can communicate synchronously by means of text messages (optional; only if the Instant Messaging system is installed).

Glossary

There are two possibilities to use the glossary. On the one hand the entire glossary can be arranged in alphabetical order (e.g. to search for a specific term or to print the entire glossary). On the other hand a special glossary mode allows to search for all existing entries within the learning content; these entries will then be highlighted. If a user moves the cursor to such an entry its explanation will appear immediately. This special mode can be activated as well as deactivated with one click.



Glossary (integrated mode): the cursor points to the term 'frentix' to show its explanation

Course Calendar

A course calendar is available in any course. Furthermore additional calendars of learning groups of this course can be seen. Entries of course calendars can be linked directly to course elements.

Learning Groups

If someone enrolls in a learning group a link to that appropriate group will appear. This allows the participant to start that group and cooperate with other group members.

4. Collaboration

A very important aspect of e-learning is the application of collaborative elements in order to join forces from any location, exchange opinions or deal with tasks. In OLAT there are two different ways of collaboration:

Working in Courses: Asynchronous collaborative elements can be embedded into the course's structure, e.g., a forum or folder. In this case collaboration is part of a didactic course concept and therefore apparent to participants in the course navigation. With the integration of a course chat synchronous communication is possible.

Working in Groups: There are three different groups in OLAT; they will be discussed in the following chapters. All these groups have in common that they offer synchronous as well as asynchronous collaborative tools. Collaboration is either based on the participant's initiative or on the coach's supervision.

4.1. Group Types

Learning Groups

Learning groups are part of courses and supervised. There are two different roles to play: that of the coach and that of the participant. Coaches of a learning group automatically dispose of administrative tools for that group in order to administer single members of their group or to configure the group's attributes.

Right Groups

Right groups are also part of courses and managed by course authors. Without appointing course administrators the course author can selectively grant someone access to course tools.

Project Groups

Except guests all system users can create project groups. Project groups have no relation to a specific course and are managed by group authors. These groups are either suitable for persons studying on their own or for collaborative tasks during a project not supervised by a coach.

If the Instant Messaging system is installed (optional), project groups are synchronised with it. Thus, members of a project group will immediately see if other members are logged in.

4.2. Collaborative Tools

All groups dispose of collaborative tools. These tools can be activated or deactivated individually for each group.

Information

All users will get a simple message as soon as they begin working within their group.

Group Calendar

The group calendar helps to manage all appointments within a group. Members of a group will see the group calendar on their home area.

Members

According to the current configuration a list of participants and/or coaches is displayed.

E-Mail

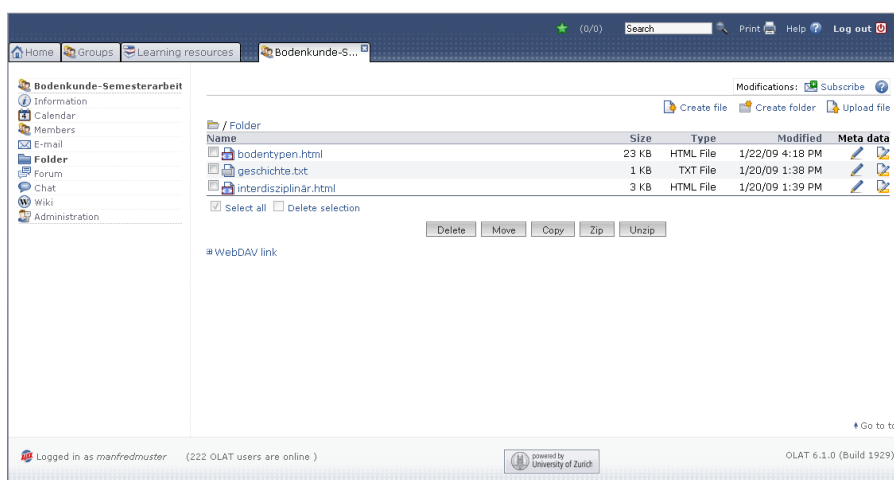
To get in touch directly with coaches and/or participants the e-mail contact form can be used.

Folder

Folders allow the exchange of any data. There is a ZIP function to upload zipped files and unzip them on the server. Forming an archive with several files allows to download them as a single ZIP file from the server.

Notifications about folder modifications are received via mail or RSS (compare "[Notifications](#)" [Page 16]).

By means of WebDav folders can also be installed on the desktop serving as a network drive. This allows working with files as if they were stored on the local hard disk (drag&drop, double-click etc). HTML documents can be edited immediately by means of the integrated HTML editor.



Documents within a group folder

Forum

A great many topics can be raised in the forum. The overview informs of subjects with new entries not read yet. These entries can be read one by one or all at once. If available, pictures of the forum contributors are displayed besides their names. Detailed information about the contributor as well as a contact form to send a private message are accessible.

The forum supports the Wiki syntax in order to make formatting easier. To each entry any number of documents can be attached.

There is the possibility to be notified in case of modifications regarding a forum via mail or RSS (compare "[Notifications](#)" [Page 16]).

Wiki

The term "Wiki" is Hawaiian and means "fast." On the Internet, Wiki stands for a Content Management system that is easy to use. Anyone can create, edit or link pages in order to collaborate and gain more knowledge. The most famous Wiki is Wikipedia, an encyclopaedia created collaboratively. By means of the group Wiki any group can develop its own knowledge network.

Chat

If the Instant Messaging module is activated a synchronous collaborative tool (chat) is available. This chat is based on the Instant Messaging standard Jabber.

5. Personal Area

5.1. Home

After the login every user in OLAT is welcomed by an interface that can be personalised, the so-called "Home". The settings can be modified and a direct access to relevant learning resources is possible via bookmarks.

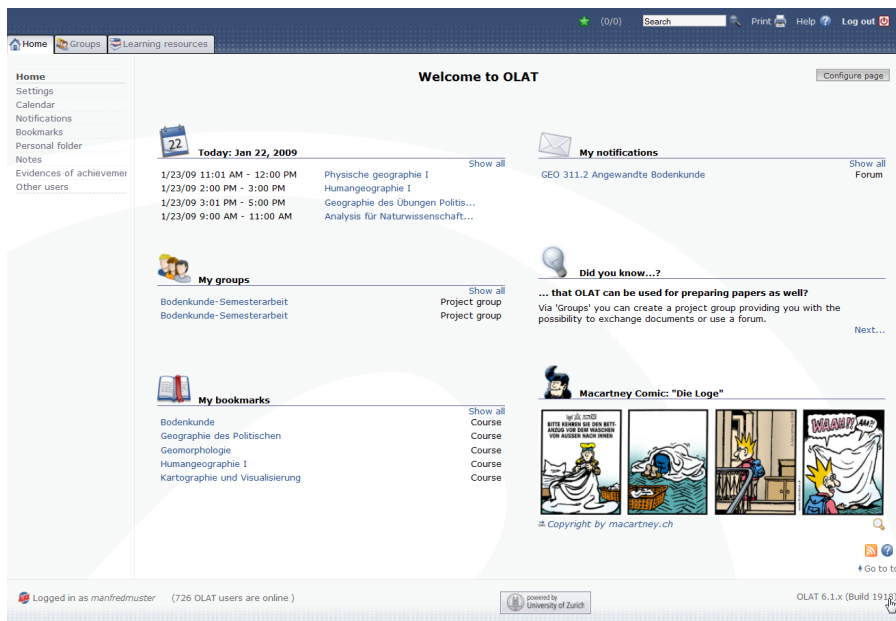
Profile, Settings and Password

Adaptations of personal data can be made in the profile at any time. Additionally, there is the possibility to modify the system settings such as language or font size.

Any user can change his or her OLAT password (if available). If the Instant Messaging module is installed users are able to modify settings regarding privacy protection.

Portal

The personal OLAT home page is designed as a portal in order to deliver relevant information in compressed form. Since this portal is profoundly modularised, users can compile the available elements as desired. They may choose between lists of personal bookmarks, groups, evidence of achievements, notes and notifications, a comic strip alternating daily, the tip of the day, etc. Moreover, users can sort the portal's entries such as bookmarks according to their needs.



Personal home page

Notifications

Each folder, each wiki and each forum offers a notification service. Users subscribed to such services will get the news on their Home. These informations can also be read externally by means of a personalised RSS feed. In addition, users get an e-mail every night if there are any modifications made on the subscribed entries.

Calendar

The personal calendar helps to keep track of personal entries. Other users will not be able to get access to these private entries as long as they not explicitly marked as "public." Along with the private calendar, group or course calendars are seen in an overlaying view.

Bookmarks

Personal bookmarks can be created for learning resources. A bookmark list on the user's Home grants easy access to courses, etc. Bookmarks can be deleted or added at any time. These bookmarks can be used externally by means of a RSS news feed.

Folder

The personal folder serves to upload files to the user's private area. This can come in handy if users want to access files from home or a computer room. The personal folder is also accessible as network drive via WebDAV.

The public folder on the other hand serves to store files that should be accessed by other OLAT users, e.g., someone's home page or project results.

Notes

If there are course notes users will see the corresponding list of personal notes on their Home. These notes can be modified or deleted at any time.

Evidence of Achievements

Any evidences of achievements is seen on the Home site, if this option is activated in the respective course. Thus, students can easily get an overview of their achievements in different courses.

5.2. Visiting Card and User Search

The Profile helps OLAT users to define those personal data that should be accessible for other users in the system. Additionally, they have the possibility to present themselves by using a picture or some text. These data form a digital visiting card.

Each user in the system has access to all other visiting cards in order to get more detailed information. It is also possible to access the public folder from that visiting card or to get directly in contact with its owner by means of an e-mail form.

5.3. Chat/Awareness

Having activated the Instant Messaging module in OLAT (optional), the so-called awareness function is available. This means that users will see any time who else is online and working on OLAT. This supports the learning process as well as the communication because users will not get the feeling of "learning alone in front of a PC." Each user has the possibility to get in touch with others and chat.

The personal status (available, I'd like to chat, away, do not disturb, not available) can always be modified. As soon as the user takes a test during a course the chat function will be deactivated.

All members of a project group will appear as personal contacts in a separate menu. Thus users can see immediately if persons they want to communicate with are online and can get in touch with them easily.

5.4. Full-Text Search

The full-text search is used not only to look for learning content in the repository of learning resources, but also to search for content in fora, folders, Wikis, CP learning contents and single pages. The full-text search can also be used for groups. The OLAT full-text search is also able to index common file formats such as Word, PDF or Excel. The gained results are restricted according to the respective access rights.

If a query is not successful, the system will automatically try to search for similar terms. This feature is known as "Did you mean..." on google.com.

6. Technology

6.1. Architecture

The LMS OLAT applies modern technology and up-to-date resources. It is programmed 100% in Java and can therefore be used along with different operating systems such as Windows, MacOSX, Linux, BSD, Unix or Solaris without further adaptation. For the persistence of data various Database Management systems such as MySQL, Postgres or Oracle can be used.

OLAT uses the Java 2 Enterprise Edition (J2EE) and is based on servlet architecture. The specifically developed Model View Controller (MVC) framework guarantees modern and fast development that is almost flawless; it differentiates strictly between representative logic, operational logic, business logic and data management. In order to attain a high degree of maintainability as well as expandability the developers particularly focus on clean isolation and on good reusability regarding the different software components.

From the version 6.1 OLAT is able to run on clusters and is scaled for 1000 simultaneously logged in users.

6.2. AJAX Mode

AJAX and Web 2.0 are applications that substitute the traditional concept of web applications based on pages for the concept of downloading single elements of a page selectively. Concerning web applications this allows for more interactivity and intuitivity. Working with applications gets faster due to reduced network traffic.

OLAT offers a dynamic, system-comprehensive AJAX mode that can also be activated on the user level. All functions in OLAT are also available in the traditional mode in case the used browser should fail to support this functionality.

6.3. Accessibility

OLAT has realised the general W3C policy in reference to its accessibility and is still improving it. Elements of the main layout can now be activated directly via shortcuts (main navigation, menu, content, tools).

6.4. Expandability

The so-called extension points allow to expand the OLAT LMS according to customer requirements without having to modify the basic system. This makes it easier to update OLAT and to integrate further developments. Examples for such OLAT extensions are additional items in the main navigation or new course elements.

6.5. Adaptability

OLAT is easily adapted to local circumstances. Its layout and all images are operated via CSS. OLAT is based on the CSS framework YAML. The appearance of an OLAT installation can therefore be modified by means of one single file.

All text elements used in OLAT can be altered by using the integrated translation tool in order to be adaptable to any specific range of application.

7. Abbreviations

AJAX: Asynchronous JavaScript and XML

CMS: Content Management System

CPU: Central Processing Unit

CSS: Cascading Style Sheets

eLML: eLesson Markup Language

HTML: Hypertext Markup Language

IMS CP: IMS-Content-Packaging

IMS-QTI: IMS Question & Test Interoperability

J2EE: Java 2 Enterprise Edition

Java VM: Java Virtual Machine

LDAP: Lightweight Directory Access Protocol

LMS: Learning Management System

MVC: Model-View-Control

OLAT: Online Learning And Training

QTI: Question and Test Interoperability

RSS: Rich Site Summary

SCORM: Sharable Content Object Reference Model

SPSS: Superior Performing Software System

TinyMCE: Tiny Moxiecode Content Editor

W3C: World Wide Web Consortium

WebDav: Web-based Distributed Authoring and Versioning

WYSIWYG: What You See Is What You Get