

Ratings and Details for

- **Blackboard 5** (by [BlackBoard](#))
- **LearningSpace 4.0** (by [Lotus](#))
- **WebCT 3.6** (by [WebCT](#))

Summary

Blackboard 5

Strong points

Does not lack essential functions.

- Simple to use interface
- Strong built-in synchronous communication: the Java applet "Virtual Classroom" includes a shared whiteboard, chat and slide presentations.
- Good teamwork support.
- Differentiated access rights and user roles
- Powerful spreadsheet-like management of student's grades

Weak points

- Very limited customizability of user interface;
- Student can only make "global" annotations

LearningSpace 4.0

Strong points

- powerful and scalable environment
- includes complete synchronous communication tool suite (collaboration server)
- cheap for universities
- detailed tracking and reporting functions
- interoperability

Weak points

- for students only fully functional on windows platforms
- limited number and functionality of

WebCT 3.6

Strong points

- Powerful management of resources (html pages, images, audio files, ...).
- Impressive collection of useful preprogrammed tools.
- Strong communication features.
- Flexible and powerful management of student files / student grades.

Weak points

- relatively slow response times in the authoring environment
- complex - sometimes clumsy - user interface for author (due to complex

- for a whole course.
- Very limited hypertext features.
- No search function.

- student tools compared to other systems
- serious hardware and software requirements on server side
- server supports only Intel/NT platform

functionality and detailed parameters)

Student's Environment

Access to course material

Blackboard

LearningSpace

WebCT

Keyword search



The tool has a built-in full-text search engine, which allows to find keywords

- in the course material and
- in the private annotations of the student.

very important feature

not available



not available (course content is not stored in the system)



Fully supported
Different components can be searched selectively: course content, content module table of contents, headings in content pages, and discussion articles

[Screenshot](#) [Ref:5]

Searchable image archive



The tool provides an image archive. It can be searched with a keyword search engine.

not an important feature

not available



not available



- Multiple image databases (e.g. for different parts of the course) can be included
- Images have to be

uploaded individually,
which is tedious for a
large database

Screenshot [Ref:8]

Course download / off-line working



no particular support

The entire course or parts of it can be downloaded to a local client. The student can work locally. If he/she reconnects, the changes are automatically synchronized or replicated. All important platforms (Win,Mac,Unix) should be supported. The advantages of this are:

- shorter time for a client to be online, and hence lower connection costs
- quicker access, once the content is downloaded

important feature ⓘ



Not supported - student must be online to enter a course. However, (parts of) the course content pages can easily be put on a CD-ROM.

[Ref:1]



Not supported

Course can be printed



no particular support for this

The entire course or parts of it can be downloaded in a printer friendly version. This might be important for students, who prefer reading on paper instead of computer screens. It is also useful for a student to keep a printed archive of a course after he/she has completed it. In that case, personal annotations should also be printed.

important feature ⓘ



no specific support for printing of course material

[Ref:10]



Printing supported. Student can check chapters/sections, which are then compiled to a single HTML page.
The student's annotations are not printed (can only be printed separately).

Screenshot [Ref:8,11]

CD-ROM support



The entire course or parts of it can be distributed on a CD-ROM. The access via the Web interface remains transparent. This is important if:

- Parts of the course are copyright protected and cannot be published via the Web
- Parts of the course consist of huge data quantities (i.e. high resolution images) that cannot be downloaded via a telephone line

Documents stored on a CD-ROM can be loaded from within the Blackboard environment (this is called "offline content"). The CD-ROM drive letter can be manually set by the student (defaults to D: on Windows).



CD-ROM content can easily be integrated (the course content pages are not directly part of the LS system, but links to external resources)



The CD-ROM feature essentially enables quick access to large content files (images, audio, video) that would take too long to download with a low bandwidth connection (e.g. 56K modem). However, the student has still to be online.

[Screenshot](#) [Ref:1,8,11]

important feature

Ergonomic user interface



The student's user interface should be intuitive and easy to use.

very important feature

Courses have a consistent look-and-feel.
Navigation is sometimes complicated because the "back" button of the browser doesn't always work.
There are no next-page / previous-page navigation buttons
The names of Individual documents appear in the "Course map" tool, but they cannot be clicked (only chapters heading have links).



intuitive UI



Courses have a consistent interface/look-and-feel.

[Screenshot](#)

[Screenshot](#) [Ref:2,8]

[Ref:2]

Private space and

customization

Student can make private annotations of course material



The student can make annotations to parts of the course, which are only visible to him/herself.

very important feature

The "Electric Blackboard" allows users to save notes for a particular course within the Blackboard 5 environment.

Limitations:

- Only one note is available, where students must enter all their comments/annotations.
- Notes cannot be attached to individual pages.

[Ref:10]



not supported



Any page can be annotated with raw (unformatted) text (HTML can also be used, but at the student's own risk, as errors may jeopardize the page functionality!). Annotations are not displayed together with the page content, and it is not directly visible, whether a specific page has annotations or not (one click is needed).

[Screenshot](#) [Ref:1.8,11]

Student can make bookmarks.



Student can make bookmarks of course material.
The system should allow common browser bookmarks and additionally internal bookmarks.
Browser bookmarks (URL) can be exchanged between students, i.e. by email.

very important feature

It is difficult to make bookmarks, because the presentation is always frame based.
However, single pages/frames can be bookmarked by copying the page url to a bookmark entry.
Navigation buttons won't be displayed in that case.

[Ref:8]



LS's frame state can't be bookmarked.
Browser bookmarks don't work. No internal favourites list available.
However, bookmarks to content pages are possible.

[Ref:8]



Bookmark tool available. Student also has a private bookmark section in myWebCT.

[Ref:8,11]

Individual choice of learning



sequence

The student can customize the learning sequence, depending on his/her preferences, previous knowledge and educational background.

The student has a single, hierarchical view of the course content. The content can be freely addressed in this hierarchy.

Student can jump to any document in a table of contents.

important feature ⓘ

[Ref:8,10]

Resume learning session



The student can interrupt a learning session at any time. He/She can resume it at the same location where the interruption occurred.

not supported

[Ref:10]

not available. However, student sees a graphical indicator for each course or resource whether it has been completed, partly completed or not yet visited.

When the student returns to a course, WebCT can place him/her back at the same position and in the same context he/she was in the previous learning session.

very important feature ⓘ

[Ref:2]

Calendar tool



Calendar tool

Calendar for institution, course and personal events.
Course specific calendar (set up by instructor) for items like: meetings, exams, etc.
Student has also private section.

not available

Available
Starting with version 3.6, students have a centralized calendar, enabling them to view a single calendar with information for all their WebCT courses.

important feature ⓘ

[Ref:1]

[Ref:10]

[Screenshot](#) [Ref:1]

Student presentation area



The student can present himself/herself to his/her fellow students. This is useful to show the social context for the student.

Each student can create his own homepage, where he can upload

not available

Students can create their own homepage.

show the social context for the student.	his/her image, write a short intro message and personal information, and publish 3 favourite links.	not available	The instructor can allow groups of students to create presentations. The students then have their own presentation space, where they can upload and manage a set of files.
important feature ⓘ			[Ref:1]
	[Ref:10]		

Screenshot [Ref:1,2,8,11]

Customization of "look and feel"	○	⊖	○
Customization of "look and feel"	very limited (change of navigation button color and shape).	not available	Student can select the language for the course interface (but only if the corresponding tool was added by the course author).
not an important feature ⓘ			
	[Ref:10,8]		[Ref:8,11]

Username and password security	⊕	⊕	⊕
All personal data (annotations, quizz results etc.) is protected at least by a username and a password. Enrollment to multiple courses with a single username/password is desired.	Supported.	Same username and password for multiple courses. Since all content pages are external to the system, their access can't easily be protected by username/password.	Using "myWebCT" allows students to access multiple courses with a single global ID. (myWebCT is a central location where students see a list of courses in which they are registered).
very important feature ⓘ			
		[Ref:1]	[Ref:1,8,11]

Asynchronous student-student

communication

one-to-one email



The environment integrates the communication between two persons using regular email (either with web-interface or using an external email client). Alternatively, internal (local) messaging is supported (student does not need an email address).

Regular email can be sent through web based forms, and can include attachments. Students need a regular email address.

email

[Ref:1,5]

Web based (internal) email. No regular email account required. Supports attachments, automatic forwarding to a "regular" email address, replying and replying with quoted message. Messages can be organized in folders

very important feature

[Ref:2,10]

[Screenshot](#) [Ref:1,2,5,8]

one-to-many email



The learning environment integrates the communication between a person and a group of persons via email. Flexible mail list (like persons in the same class or working group) should be supported.

Comfortable interface to send web based (regular) email to all users, to all groups, to instructors, to teaching assistants, to self defined groups, to instructor defined working groups.

email

[Ref:1]

Fully functional web based email. Special support to send messages to groups available.

very important feature

[Ref:1,2,8,11]

[Ref:1,2,10]

Discussion forums



The learning environment integrates the communication within a group of persons as a discussion forum. A post of a person to a forum is automatically visible to all members of it.

Web based forums ("discussion boards"). Forums are created by instructor. The interface is intuitive.

- Message can be ASCII or HTML
- Student can create new threads.
- Messages can have

Web based forum included

The async conferencing tool (called "discussions") is multi-fora, threaded, and searchable. Postings can have file attachments. Student can create own

very important feature

attachments. (Bug: attachments are lost, if message is previewed before sending)

- Messages can be sorted by author, date, subject.
- Forum content is searchable.
- Forum content can be archived.

[Ref:2,10]

discussion topic.
A set of postings can be compiled to a single file for further processing.
Private subtopics can be created for students groups

Many views, tools and customisation options are available.

Screenshot [Ref:1,2,8,11]

Teamwork tools

The learning environment provides teamwork mechanisms. See also teamworking features from the teachers point of view.

important feature ⓘ



Groups can have private file exchange areas (drop boxes), virtual classrooms, email and forums.



collaboration module (virtual classroom) can be used by smaller groups.

[Ref:2,10]

asynchronous teamwork is supported by discussion forum

no shared workspaces or other groupware tools are included.



Groups of students can be created (also automatically, at random).
Groups can create their own presentations and have private discussion forums.

[Ref:8,11]

Synchronous student-student communication

Blackboard


LearningSpace

WebCT

Chatroom



A zone, where students instantly exchange text messages. The chatroom is visible to a group of students.

important feature 

Integrated, applet based synchronous communications tool "Tutonet virtual classroom". It includes:

- Chatroom
 - Shared whiteboard
 - Participant information panel
 - Slide panel. The slide panel can be used by the instructor to make synchronous slide presentations. Slides are just URL's.
- Features:
- The virtual classroom can be monitored by the instructor (he can grant/refuse access of a student to virtual classroom activities)
 - Archive section (see questions, answers etc. of previous sessions)

[Ref:2,10,8]

part of collaboration module

Screenshot

Supported (Java applet). Enables chat within same course, or outside course to any course on same server. Chat conversations can be saved and read by instructors.

Screenshot [Ref:1,2]

Shared whiteboard



Whiteboard facility includes a window that supports shared drawing. The whiteboard is visible to a group of students.

not an important feature 

Fully supported (See "chatroom")

[Ref:2,10]



a shared whiteboard is not available, but LS offers more generally application sharing as part of the collaboration module



Supported (Java applet)

- can display an image on the screens of all users who are logged on to a whiteboard session
- users can save the image displayed on the whiteboard for future use
- instructors and students can upload images which can then be used in

whiteboard sessions

[Screenshot](#) [Ref:1]

Audioconferencing



Includes broadcasting of audio data.

not integrated

part of collaboration module (requires MS netmeeting)

Not native

not an important feature

[Ref:10]

[Ref:2]

Videoconferencing



Includes broadcasting of video data.

not integrated

part of collaboration module (requires MS netmeeting)

Not native

not an important feature

[Ref:10]

[Ref:2]

Pedagogical tools

Blackboard

LearningSpace

WebCT

Progress tracking



Progress tracking includes some facility for a student to compare his learning progress with the learning objectives or with other students.

Student can view his/her grades if access is granted by instructor.

personal progress tracking. Student can't compare with progress of fellow students.

Personal progress tracking and comparison with group ("my progress" and "my grades" tools)

important feature

[Ref:10]







[Screenshot](#)

Student can generate detailed quizz statistics and reports.

[Screenshot](#) [Ref:1,8,11]

Author's Environment

Production of course material

	Blackboard	LearningSpace	WebCT
No technical knowledge required to develop course material The course author should not be forced to learn or know about technical details of HTML or other formats. important feature ⓘ	 The environment provides simple to use editors to write course content, staff presentation, announcements, course informations etc. It also provides a "Smart text" mode to include links in a document. Adding more sophisticated content (images, lists, text attributes, etc.) requires HTML knowledge or an HTML editor. [Ref:8,10]	 Authors have to know file format for quizz import [Ref:1]	 Content is created with external editors (text, HTML, graphics, etc.), and uploaded into WebCT (copy-paste can also be used for editing HTML documents). [Ref:1,8,11]
Online HTML editor included The system includes an online HTML editor with a web-interface. This is not an important feature because a specialized external HTML authoring tool will usually do a better job. However, the system should well integrate to a wide range of existing HTML authoring tools. not an important feature ⓘ	 Only supports "smart" translation of raw ASCII to paragraphs, and automatic translation of URLs into links. [Ref:10]	 HTML-source code can be edited online [Ref:1]	 A built in, web based content editor, is available, but only for creating so-called "organizer" pages (these are a kind of table of contents, which can contain links to other WebCT tools). It allows the creation of formatted text pages (text attributes: alignment, color, size, bold, italic, underline, link, unlink, etc.).

			alignment, color, size, bold, underlined, italic) including images without any knowledge of HTML. Special characters (i.e. accented) are not translated to ISO-latin/8859 entities.
			[Ref:1,8,11]

Formula editor included



The system includes an editor for chemical, mathematical etc formulas. not included

not available

Not available

This is not an important feature because a specialized external formula editor will certainly do a better job. However, the system should well integrate existing formula editors.

[Ref:10]

[Ref:1]

[Ref:1]

not an important feature

Import / convert existing material



The system offers support to convert existing course material in HTML or ASCII format or in word processor formats like Word, WordPerfect, LaTeX etc. Most important is support to integrate existing HTML documents. Links between HTML documents must not be destroyed. Upload of a set of documents and images in one step is desired.

HTML file upload is cumbersome and has bugs/problems:

- There is no difference between "Display media within page" and "Create link".
- Links between 2 uploaded pages are destroyed.
- The same images referred to by multiple pages, have to be unloaded multiple

Quizz data can be imported using a proprietary text file format

[Ref:1]

Existing HTML pages including images can be uploaded individually or at once in a zip archive. Relative links between documents are preserved.

Several IMS standards for import/export of data are supported (see "Standards" below).

[Ref:1]

very important feature

to be uploaded multiple times

The above problems can be circumvented by uploading a set of pages/images in a file archive (zip or tar). Links between documents from different archives are not possible. Uploaded files can't be modified or edited individually. System uses standard database accessible through SQL. Quizz data can be imported and exported.

[Ref:2,10,8]

Author can make personal annotations



not supported

The author can make annotations to the course material which are visible and accessible only to herself/himself.



[Ref:8,10]

Some resources have a keyword field. Fully private comments are not supported



Author can attach anything as resource (see resource manager)

[Ref:1]

important feature

Multiple authors support



The system supports multiple authors for one course. This includes features like locking parts of a course, personal annotations for each author etc.

very important feature

The system allows multiple authors with different access rights. There are no private content sections, that can only be edited by one author.



[Ref:10]

System supports check-in and check-out locking of (parts of) courses. Multiple authors can develop a course. No centralized management of content available.



Multiple authors can edit the course contents but no resource locking is supported (i.e. concurrent access is at the authors' risk!).

Index creation support



The tool supports the creation of a course index

Not supported

not supported

Contains a complete index editor which can link to individual content pages. Supports also index subentries

important feature

[Ref:8,10]

[Screenshot](#) [Ref:6,8,11]

Glossary support



The tool supports the creation of a course glossary

Not supported

not supported

Contains a complete glossary editor.

important feature

[Ref:8,10]

- glossary is searchable
- can contain text or images
- keywords in course content can be linked to glossary definitions
- glossary can be imported and exported as raw ASCII file

[Screenshot](#) [Ref:6,8,11]

Web interface for course development



The course can be developed and maintained with an ergonomic web interface.

Course can be developed and maintained with web interface. There is no support to create or maintain links between pages. Identical images (i.e. navigation

Web based course administration. Web based course structure editor.

Includes management of resources, organization and presentation of course, navigation and creation of simple content.

very important feature

bars or headers) have to be uploaded again when they are reused -> changing the original image only changes the image in one single page!

[Ref:10,8]

Once a content page is uploaded, it can either be overwritten by a new page or its source code can directly be edited.

Numerous tools (color picker, image manager, icon layout editor, access counters, ...) are functional and simple to use. However, due to the complex functions and the large number of settings, the user interface is quite complex at times (but this is a natural limitation of HTML/JavaScript web-based interfaces).

Context sensitive help is available.

Overall navigation through tools and functions requires some experience.

Depending on server speed, there can be a delay from the time a button is clicked until a new page is displayed (designer only)

Offline course development interface



Not supported

The course can be developed and maintained with an ergonomic offline interface (a local application that runs on all important platforms).



course content is created with external tools on local machine

[Ref:8]



Third party tool [Respondus](#) can be used to develop quizzes offline.

important feature ⓘ

Module management	Blackboard	LearningSpace	WebCT
Version manager Version manager important feature ⓘ	⊕ Metadata option offers simple version management. [Ref:10]	⊕ Every resource has a version field. Screenshot [Ref:11]	⊖ Not available [Ref:11]
Course structure editor / manager Editor for course structure. Learning modules and other resources can be managed and arranged in a flexible way. important feature ⓘ	⊕⊕ A course is structured in content items (text pages) and folders. They can be freely moved around. [Ref:10]	⊕⊕ Online editor to design course structure Screenshot [Ref:1]	⊕⊕ Course can be created as a series of modules, which can be linked together (e.g. using organizer pages). Various presentational (navigation buttons, icons, sizes, background colors, ...) and logical properties (course hierarchy, numbering, ...) can be adapted. Screenshot [Ref:1,8,11]
Curriculum manager (learning objectives) Curriculum manager (learning objectives) very important feature ⓘ	⊕ No specific feature for learning objectives. General course informations has to be used for this purpose (not integrated with	⊕⊕ Learning objectives available as special resource. The author can define as many objectives as needed.	○ Course objectives can be defined in the syllabus tool, but they are independent of the course content (i.e. they only serve as

course structure manager).

[Ref:10]

Screenshot


information, and are not used to define a learning path).

WebCT also has a "Goal Editor" to summarize the content and set the learning objectives for the current page.

[Ref:1,8,11]

Flexible resource pool

Manager and database for the resources (documents, images, URL's etc.) for the course developer or the student.

important feature 



Manager for "external links". These are resources (URL's), which are related to the course.



The resources (content) is not managed or stored in the system. It must be managed offline.

[Ref:10]



Powerful general hierarchical file manager (web based). Special support for html, image, audio and video files (i.e. quick preview).

- Upload, zip, and unzip of zip-archives supported
- File manager initially contains a couple of WebCT built-in documents

Contains a resource manager (resource bank). Supported resource types are books, articles and URLs. Content pages can contain a list of pointers to resources from the resource bank.

Screenshot [Ref:8,11]

Quizzing features

Blackboard

LearningSpace

WebCT

No HTML knowledge required to develop quizzes

No HTML knowledge required to develop quizzes

important feature ⓘ



Simple text questions can be created with integrated editor. Special text attributes and formatting require HTML knowledge, however. All quizz questions fields accept HTML code



[Ref:10]



[Ref:1] Questions can be entered in two formats: plain text or HTML (requires HTML knowledge, or copy-paste from an external HTML editor). An image can also easily be added to each question.

[Ref:1,8,11]

Quiz editor/manager included

The system includes an editor for quizzes as well as a manager to organize the questions in a pool.

important feature ⓘ



The system includes an assesment manager to create quizzes and surveys, and a pool manager to store and reuse standard questions (assessments can use a random set of questions from the pool). Question pools can be imported, exported and searched for keywords.

Quizzes are accessible in the assessment section - they can't be mixed/integrated with the course material.

[Ref:2,10]



Web interface to create and manage quizzes

Screenshot [Ref:1]























Includes quizz/self-test editor and manager for a built-in questions database.

Supports upload of questions in a raw ASCII format (format in explained in WebCT online help).


With the powerful third party editor [Respondus](#) (available for windows platforms only) , authors can create quizzes offline and import them into WebCT.

Screenshot [Ref:1,8,11]

Multiple choice questions The student has to click on the correct answer to a question. very important feature ⓘ	  Includes also : multiple correct answer questions. special case True/False questions. ordering questions. [Ref:4,10]	  single or multiple correct answer questions supported [Ref:1,4]	  Available, also multiple correct answers. Optional cumulative and negative scoring and weighted correct answers. [Ref:1,8,11]
Multiple image choice questions The system asks a question and shows a set of images as possible answers. To answer to the question, the student has to click on the correct image. important feature ⓘ	  Any media-file can be uploaded as question or answer. [Ref:10]	 not native [Ref:5]	  Fully supported. [Ref:5]
Image map questions The system asks a question and shows an image. To answer to the question, the student has to click on the correct part/area of the image. important feature ⓘ	 not available [Ref:10]	 not native [Ref:10]	 Not available [Ref:11]
List matching questions Student has to match pairwise the entries of two lists. important feature ⓘ	  available. [Ref:10]	  fully supported [Ref:10]	  Fully supported. Includes images. Screenshot [Ref:8] [Ref:8,11]

Randomized and calculated questions

The system generates random values for variables, thus giving different questions to different students.

important feature 



not available

[Ref:10]



Fully supported. Each calculated question consists of a formula containing one or more variables, as well as a range for each variable.

[Ref:5,8,11]

Timed quizzes

Timed quizzes

not an important feature 



Displays a running clock, timing test completion.
All question types can be timed.

[Ref:10]




[Ref:5] For every quizz, a time limit can be defined.

[Ref:5,8,11]

Timed test submission

The system gives a deadline for a student to submit/upload his work/test.

important feature 




For every quizz, a date of availability can be defined.

[Ref:8,11]

Fill in-the-blank test

2 variants:
The answer is not evaluated (self-test)
The answer is automatically sent to and evaluated by the instructor

important feature 



[Ref:10]



does not allow multiple blank fields in a text.



Fully supported

[Ref:5]

[Ref:5,8,11]

Short answer test



2 variants:
The answer is not evaluated (self-test)
The answer is automatically sent to and evaluated by the instructor

[Ref:10]

Auto correction feature: Student's answer is matched against a regular expression

Fully supported

[Ref:8,11]

important feature

Other question types



Ordering questions: Student has to put answer in the correct order.

not an important feature

[Ref:10]

API to add custom question types



Not available

Programming interface that allows to add custom question types implemented in Java, JavaScript, ASP, PHP or other languages. Question results should be integrated to student's gradebook.

Custom questions implemented with Flash, can be integrated to courses. (not an official API)

Not available

very important feature

Quiz parameters



Additional parameters to define visibility or access to quizzes.

Quizz can be password protected

Questions can be:

important feature

- delivered at once/one at a time
- password protected

- restricted to be accessed by specific IP addresses (can define one mask)
- restricted to be visited only once
- restricted to be visible in a specific time slot
- released to specific subset/group of students
- associated a limit for attempts

[Ref:8,11]

Actions based on test results ⊕

Based on test results the system provides actions like:
 Give a short feedback to the student
 Autocorrect the answers
 Notify the instructor
 Grant access to next course sections
 Add/remove coursework
 Update student's grades

important feature ⓘ

All question types (except for short answer tests) can be automatically evaluated:
 give a feedback to student (detailed and general)
 can correct wrong answers
 disable multiple attempts
 update of gradebook
 no notification of instructor

[Ref:10]



- availability of course (modules) can be bound to success in quizzes. Detailed criteria for "success" can be defined.



- Update students gradebook (also if multiple attempts are allowed)
- Release/hide scores to student
- Show/hide correct answers
- Show/hide question feedback
- Grant access to new quizzes
- Quizz results can be graded by instructor or automatically by WebCT

[Ref:8,11]

Teacher's Environment and Pedagogical Tools

General	Blackboard	LearningSpace	WebCT
Multiple teachers support The system supports multiple teachers for one course. Either <ul style="list-style-type: none"> every teacher cares for its own group of students, or every teacher cares for a particular part/chapter of the course. important feature ⓘ	++ Course can have multiple instructors, each one having an individual account and access rights [Ref:10]	++ ... with access rights specific to documents, activities and fields (lessons, modules etc.) [Ref:1]	+ A WebCT course "belongs" to a single designer (= instructor). However, the designer can grant designer rights to other users. Teaching assistants can also be defined. [Ref:1,2]

Teamworking	Blackboard	LearningSpace	WebCT
Teacher can set up group of students Teacher can set up group of students very important feature ⓘ	++ Classes can be segmented into study groups (see also "Teamworking"). [Ref:10]	+	++ Groups can be defined individual by individual and at random (by number of groups or number of students per group). Private discussion topics can also be created automatically for each group, as well as a presentation area (=a set of HTML files).

Screenshot [Ref:1]

Group file upload capability

Group file upload capability. Resource pools for groups.

Supported through the dropbox tool.

important feature



Groups can put their presentations (=a set of HTML files) on the WebCT server, where they can be viewed by any other students

[Ref:8]

Tutoring**Blackboard****LearningSpace****WebCT****Asynchronous tutoring (i.e. by email)**

Asynchronous teacher-student communication (i.e. by email)

fully supported



Messages with attachments.
Supports message classes.
Multiple forums.

[Ref:10]



Messages with attachments.
Supports message classes and context sensitive messages (relative to consulted Web page).
Multiple forums.

[Ref:1]

very important feature

[Ref:1]

Synchronous tutoring (i.e. Audio-, Videoconference)

Synchronous teacher-student (i.e. Audio-, Videoconference)

Synchronous tutoring supported by Virtual Classroom (see section synchronous student-student communication).
No native audio or video conferences



included in collaboration module (chat, audioconferencing, videoconferencing, application sharing)



Chat and whiteboard (no audio-videoconferences)

[Ref:1]

important feature

[Ref:1]

[Ref:10]

Teachers can assign specific course material to group of students

Teachers can assign specific course material to group of students

important feature ⓘ



Not really supported. Instructor can send individual material through drop box.



[Ref:10]



[Ref:1] Specific course materials and tools can be released to specific students (but not to presentation groups), also depending on their grades in a quiz.

[Ref:1]

Course evaluation

Blackboard

LearningSpace

WebCT

Trace of student's paths through modules

The student's accesses to pages etc. are logged by the server. The teacher can analyze the access trace of a student and give individual support and hints.

important feature ⓘ



Tracking of content usage can be enabled/disabled for each content item.

[Ref:10]



- all student activities are tracked (except for actions in "external" course content pages)
- AICC standards compatible student tracking



[Ref:1]

A tracking feature allows instructors to see how students use the various course tools (content, questions, etc.). (each student can also see his own tracking statistics).
Wide range of evaluation possibilities.
Quizz results can be exported to text file
Teacher can be notified about quizz results of students

[Ref:1]

Statistical/graphical reports




The interactions of students with the teaching system are logged. These interactions include page accesses, quizz results, time exposure of course content and quizz questions etc. The system is able to generate meaningful statistical reports with textual and graphical views. The reports are used by the teachers and authors to improve the quality of the online course.

very important feature 

Provides reporting on individualized tests for final grading. Grades can be exported. Various course statistics and useful reports can be generated: overall course usage, course content usage, communications usage, group reports, student reports. Reports and statistics data can be exported or displayed graphically. There is no simple way to get tracking statistics on several content pages at once.

[Ref:2]

Complete reporting functions. 17 predefined reporting schemes are available.

 [Ref:1]

Detailed evaluation features (pairwise compare between students, compare student to group etc.)

General graphical and statistical views for student files database.


Export of quizz results supported

[Ref:1]

Grade management



Manager for student grades. Support to calculate grades based on student's quizz results.

important feature 

Powerful online Gradebook. Ergonomic online spreadsheet view with possibility to edit grades. Grades can be made visible to students

[Ref:10]



Instructors can manage and edit student results records





Grade management is very detailed (see also "Management of student files").

E-mail is integrated into student tracking and grade maintenance tools enabling lists of students with particular grade to be sent group e-mail.

[Ref:2]

Administration

General

Blackboard

LearningSpace

WebCT

Registration and follow-up of students



The system should provide online registration of students.

very important feature

3 enrolling methods:
individual enrollment of each student by the instructor
batch enrollment (by uploaded text file)
open enrollment

[Ref:10]



powerful online management of student files

[Screenshot](#) [Ref:1]



[Ref:1]

Management of student files



The system should provide management of student files. It should also integrate with common database systems used at administration offices in universities.

Support for one student attending many courses.

very important feature

With a level 3 license (expensive!), Blackboard can be integrated with an institution's students management system.



powerful online management of student files
includes import/export of student data

[Ref:1]



Spreadsheet interface for student files database. The table presentation can be freely defined and new database columns can be created. Database columns can be calculated (formula editor included).

Student files can be pasted from or copied to the clipboard (the clipboard is available in many other tools)

Supports import/export of student data.

Campus edition has an API to link to other student management systems.

[Ref:1,8,11]

Access rights



The system provides groups of users, like students, instructors, authors etc. with differentiated access rights.

very important feature

6 (exclusive!) user types:
Instructor, Teaching assistant,
Grader, Course builder, Student,
Guest.
Various access rights can be
modified individually

[Ref:10]



Detailed access rights can be
associated. It is possible to define
new user groups.



User groups:

- Administrator (one per server)
- Designer (= course author) is usually also the instructor (one per course, but a designer can grant designer level access to other users)
- Student
- Teaching assistant, a user with the right to mark quizzes and change grades of other students.

A student has a global ID/password and an ID/password for each course. MyWebCT tries to hide this as good as possible, so that the student only has to remember the global ID/password.

[Ref:8,11]

Technical Requirements

Client platform	Blackboard	LearningSpace	WebCT
Standard Web browser (entirely platform independent) <p>The only required client software is a standard Web-Browser like Netscape, Explorer, Opera etc. No special software or plug-ins are needed to browse through the course content, and the course can be accessed with the most important client platforms (Windows, MacOS, Unix/Linux, Web-Pads).</p> <p>This requirement is particularly important to prevent students from any potential frustration. Most students are not computer experts, and software installations are a considerable challenge.</p> <p>very important feature ⓘ</p>	<p>⊕⊕</p> <p>Totally platform independent. Synchronous "virtual classroom" is a Java applet</p> <p>[Ref:2,8,10]</p>	<p>⊕</p> <p>supported Exception: synchronous communication requires external tools</p> <p>[Ref:1]</p>	<p>⊕</p> <p>Internet Explorer version 5.0 and higher and Netscape Navigator 4.7x (not Netscape 6) are fully supported</p> <p>[Ref:1,2]</p>
Win 9x, NT (software or plugins) <p>If the system requires proprietary software or plugins, they should be available for the Windows (9x, NT) platform.</p> <p>very important feature ⓘ</p>	<p>⊕⊕</p> <p>Does not require plugins at all</p> <p>[Ref:10]</p>	<p>⊕⊕</p> <p>fully supported (Live module for synchronous communication). Alternatively Notes client offers additional functionality (Course authoring, download and offline reading of course material, cooperative work on documents). The use of the Notes client is therefore mandatory for authors and</p>	<p>⊕</p> <p>Standard Web browser</p> <p>[Ref:1,8]</p>

		administrators, and students who have to collaborate.	
		[Ref:1]	
MacOS (software or plugins)	⊕⊕	○	⊕
If the system requires proprietary software or plugins, they should be available for the MacOS platform.	Does not require plugins at all	synchronous communication features not supported	Standard Web browser
very important feature ⓘ	[Ref:10]	[Ref:1]	[Ref:1,8]
UNIX, Linux (software or plugins)	⊕⊕	○	⊕
If the system requires proprietary software or plugins, they should be available for the most important UNIX / Linux platforms.	Does not require plugins at all	synchronous communication features not supported	Standard Web browser
important feature ⓘ	[Ref:10]	[Ref:1]	[Ref:1]
Server platform	Blackboard	LearningSpace	WebCT
Win 9x, NT	⊕⊕	⊕⊕	⊕
If the system requires more than a standard Web-Server, the Windows (9x, NT) platform should be supported.	Fully supported. Requires Win NT or 2000, MS SQL Server 7. For level 2 and 3, a two-server configuration is recommended.	NT 4.0 Intel and MS IIS required. Also requires third party database (Oracle, MS-SQL or DB2).	Windows NT and Windows 2000 Server are supported.
very important feature ⓘ	[Ref:10]	[Ref:15]	[Ref:1]

UNIX, Linux



If the system requires more than a standard Web-Server, the most important Unix / Linux platforms should be supported.

very important feature

Supports Linux, Solaris, HP-UX, AIX IRIX. Requires Apache, MySQL (included).

For level 2 and 3, a two-server configuration is recommended.

[Ref:10]



not supported



As of version 3.5, the following UNIXs are supported:

[Ref:1]

- Compaq Tru64 5.0 and 5.1
- HP/UX 10.20
- IBM AIX 4.1
- Sun Sparc Solaris 2.6, 2.7, and 2.8
- Red Hat Linux libc6 6.2 and 7.1

[Ref:1]

MacOS



If the system requires more than a standard Web-Server, the MacOS platform should be supported.

important feature

Not supported

[Ref:10]



not supported



Not supported

[Ref:1]

[Ref:1]

General Properties

General

Blackboard


LearningSpace

WebCT

Multi language support



Multi language support

very important feature 

15 languages available: english, german, french, spanish, italian, danish, traditional chinese, simplified chinese, korean, japanese, brasilian portuguese, swedish, norwegian, finnish and dutch.

There are language packs for different languages. Availability depends on the version. Among these: French, German, Italian, Spanish.

Screenshot [Ref:1,11]

Standards / Metadata support (IMS, IEEE, AICC)




The [IMS](#) initiative is focusing on developing technical specifications that will support a broad range of learning. The IMS technical specifications will provide the general guidelines and requirements developers must write to in order to create interoperable content and management systems.

IMS is working to incorporate some fundamentals of the AICC standards.

Normalisation initiative coordinated by IEEE: Learning Technology Standards Committee [LTSC](#) and specifically the Learning Objects Metadata ([LOM](#)) working group.

Aviation Industry CBT Committee ([AICC](#)), is an international association who develops specifications for the aviation industry. The target is to enable interoperability between interactive pedagogical resources and teaching platforms.

important feature 



Allows import of AICC courses.

IMS support announced

[Ref:2,10]



The following IMS standards are supported as of version 3.6: IMS Content Packaging 1.1, IMS Learning Resource Meta-data 1.1 and Question & Test Interoperability 1.1, as well as IMS Enterprise in the Campus Edition.

[Ref:1,2]

XML support



The system allows for import and export of course content and course state (student files, gradebooks, trace reports, ...) in XML format.

not supported

[Ref:8]

very important feature 

Users can export MyWebCT in XML format.
The IMS Enterprise API (Campus Edition only) also makes use of XML.


[Ref:8]

Programming interfaces



The system provides an application programming interface (API). An API allows to add missing functions with scripts or programs.

An API greatly increases the flexibility and interoperability of a platform. However, using an API requires programming skills.

very important feature 

Blackboard level 3 provides a Java-based API unifying diverse online campus systems into one integrated platform allowing for user-driven single log-in service delivery, as well as capabilities that allow each school, department or campus within the institution to maintain its own customized environment.
The Blackboard "Building blocks" initiative should allow Blackboard to interoperate with other systems (e.g. student management, assessment software, etc.).

[Ref:8]



WebCT provides two APIs for manipulating the student databases, allowing for interoperability with an institution's Student Information System (SIS).

- a proprietary standard API,
- an XML-based IMS Enterprise API (only in Campus Edition)

The APIs can be used either through the command-line or through a Web forms-based interface.

[Ref:8]

Backup support



The entire system can be backed up as well as individual courses.

Elements of a course (contents, discussion boards) can be



Common backup of 1) LS's database content and 2) course content pages



- entire system backup or single courses

as individual courses.

archived individually or together.

on web server

very important feature ⓘ

- backup can be initiated by web browser (admin), by command line or by automated tasks (like cron)
- course backups are cross platform and upward version compatible
- Campus Edition also includes a couple of course management scripts to manage courses from the command line

[Ref:8]

Interoperability



Can the platform be integrated in the existing computer infrastructure? This requires compatibility with common data standards, protocols and programming languages (JavaScript, Java, ASP, PHP)

very important feature ⓘ

Blackboard level 3 provides a Java-based API unifying diverse online campus systems into one integrated platform allowing for user-driven single log-in service delivery, as well as capabilities that allow each school, department or campus within the institution to maintain its own customized environment. The Blackboard "Building Blocks" initiative should allow Blackboard to interoperate with other systems (e.g. student management, assessment software, etc.).



- since the course content is external, any web-technology can be used
- synchronous communication tools use H.323 (audio- and videotransmission) and T.120 (realtime- and multipointcommunication) standards
- LDAP support announced

Web technology compatibility

Compatibility with common web media types for audio (mp3, real audio), video (avi, quicktime), images and animations (gif, jpeg, animated gif, shockwave), 3D objects (vrmf) and Java applets.
Compatibility with common programming languages (Java, JavaScript) and standards (CSS)



Works with any standard web media (flash etc)
(course content is external to LearningSpace)

[Screenshot](#)

very important feature

Support

Blackboard

LearningSpace

WebCT

Technical support



Technical support

Direct support by email, FAQ's and users forum (mailing list).

available (Mindspan solutions)

Available.

very important feature

[Ref:2,8]

[Ref:1,2]

- WebCT also hosts several mailing list and discussion forums where developers can ask questions. These mailing lists are very active and also animated by the WebCT support team.
- A knowledge base contains answers to common problems with WebCT.
- A feature called "Ask Dr. C" is also available for people to get answers to

- problems they have with WebCT.
- Customers can also buy consulting services from WebCT to help them implement a WebCT solution.

[Ref:1,2,8]

Pedagogical support



Pedagogical support

Downloadable tutorials.

available (Mindspan solutions)

important feature

[Ref:8]

System documentation



System documentation

Instructors manual, students manual.

printed and online

Printable and online.

very important feature

[Ref:8]

[Ref:1] Additional documentation is available for developers and students. It is offered by experienced WebCT users at educational institutions.

[Ref:1,8]

Tutorials, Workshops, Services



Support for training of course authors, teachers, administrators.
Services like hosting, consulting, course implementation.

Various downloadable tutorials

Various services are offered by Lotus Mindspan Solutions Group.

[Ref:8]

- online and printable tutorials for course authors
- training and certification

implementation.

important feature 🗨

in WebCT for users, developers, system administrators and trainers.

- course implementation services

No specific support is available in switzerland (but WebCT has representatives in Germany).

[Ref:8]

Stability / Bugs

Overall robustness of the environment.

very important feature 🗨

[Ref:8] The current version of WebCT (3.6) is still built on the same code base as the original version. This makes it difficult to maintain and prone to bugs. An entirely new version, codenamed "Cobalt", is announced for the first quarter of 2002 (see [Leveraging Technology to Transform the Educational Experience, a WebCT white paper](#)).

[Ref:8]

Cost

Blackboard

LearningSpace


WebCT

Costs for licenses etc.



... for

- license fees
- administrative maintenance
- system maintenance

important feature 

- Bb 5 Level One (Course Manager): \$5,000 USD per server per year
- Bb5 Level Two (Course and Portal Manager): \$25,000 USD per server per year
- Bb5 Level Three (Advanced Course and Portal Manager): \$50,000 USD per production server per year plus one-time integration fees.

NOTE: All prices are based on < 25,000 users

Special conditions for higher education organizations by Passport Advantage contract (the Lotus Academic Solution Licenses have been withdrawn). Prices are not published yet.

WebCT Standard Edition academic licence cost per year, for one server and an unlimited number of students: \$5000 (June 2001)

Licence cost for Campus Edition depends on each solution (no price quote available).