

Lanka Education and Research Network

Workshop on Digitalizing Research & Education Content
on LEARN FOSS Free Open Cloud Platform

LEARN Moodle as a Service



National Research & Education Network of Sri Lanka

Learning Management Systems (LMS)

- Software application or platform designed specifically to create, deliver, manage, and track online learning and training programs.
- Provides a centralized hub for teaching, learning, and collaboration.



Key Features of LMS

- Category management
 - Hierarchical category structure
 - Create categories (Levels, Year)
 - Create subcategories (Semesters, Departments, Units, Subject area)
 - Move courses between categories
 - Assign roles/permissions at category level
 - Archive or hide entire categories for past semesters

Key Features of LMS

- Course management
 - Create and edit courses
 - Upload lessons (videos, PDFs, quizzes)
 - Organize content into modules (Weekly/Topical)
 - Hide/ Show the content for students
 - Enroll instructors and students
 - Create and manage content bank
 - Backup and restore

Key Features of LMS

- Assessment & grading
 - Manage question banks
 - Create grading scales (Letter, Points, Rubrics)
 - Automated and manual assesment marking
- Progress tracking
 - Monitoring student activity/completion
 - View student reports

Key Features of LMS

- Collaboration tools
 - Forums, chats, wikis
- Certifications
 - Issue badges or certificates upon completion
- User management
 - Add users to the system (manual, bulk, SSO, email)
 - Create custom roles and assign users into roles

Key Features of LMS

- Integration capabilities
 - LTI (Learning Tools Interoperability)
 - API for third-party tools (Zoom, Microsoft Teams)
 - Single Sign-On (SSO) (Google, Microsoft, LDAP)
- Learning analytics & insights
 - Predictive analytics (Identify at-risk students)
 - Competency-based tracking (Skill progression)

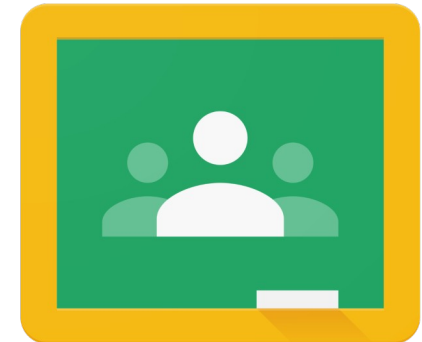
Popular LMS



CANVAS



Blackboard



Google Classroom

Popular LMS

Feature	Moodle	Blackboard	Canvas	Google Classroom
Course Categories	Yes (Full hierarchy)	Yes	Yes	No
Course Management	Lot of features	Lot of features	Drag-and-drop content	Google drive content
Assessment & Grading	Automated/ Manual	Automated/ Manual	Easy grading	Basic grading
Progress Tracking	Need a plugin	Built-in tool	Built-in tool	Limited tracking
Collaboration Tools	Forums, wikis, chats	Discussion boards	Groups, collaborations	Google Docs, Meet
Certification	Need a plugin	No	Badges	No
User & Role Management	Custom roles	Complex permissions	Easy user management	Basic

Popular LMS

Feature	Moodle	Blackboard	Canvas	Google Classroom
Payments	Need a plugin	No	Need a plugin	No
Plugins (Add-ons)	Plugin directory	Limited	App marketplace	No
Themes	Yes	No	Yes	No
Integration Capabilities	Many tools	Limited	Many tools	Google apps
Analytics	Need a plugin	Built-in	Built-in	No
Setup complexity	Complex setup/ Cloud	Service provider	Easy cloud	Easy cloud
Pricing	Free	Expensive	Freemium	Free

Moodle Intro

- Moodle (Modular Object-Oriented Dynamic Learning Environment) is a free, open-source learning management system (LMS) designed to help educators create and deliver effective online courses.
- It is widely used in schools, universities, and corporate training environments due to its flexibility, scalability, and robust features.



User Roles in Moodle

- There are predefined roles and custom roles in moodle
- Predefined roles:
 - Site administrator
 - Manager
 - Course creator
 - Manager (in-course)
 - Teacher
 - Non-editing teacher
 - Student
 - Guest

Site Administrator

- Site-administrator is the main site-wide user who have unrestricted access
- Site configuration
 - Site management including site settings and language
 - Enable/ disable site-wide features (ex. Messaging)
- Course & category management
 - Managing course categories
 - Able to add courses and assign managers, teachers, and students
 - Manage default course settings

Site Administrator

- User management
 - Add users manually or via bulk upload
 - Reset user passwords and suspend user accounts
 - Assign roles (e.g., Manager, Teacher, Student)
 - Configure and manage user authentication:
 - Manual
 - Email-based
 - External systems (LDAP, SAML, EduID, etc.)

Site Administrator

- Manage enrollments
 - Enable enrollment plugins and methods:
 - Manual enrollment
 - Self-enrollment via email
 - Cohort enrollment (groups of students)
 - SSO enrollment (LDAP, Shibboleth, SAML)
 - Guest access
 - Configure enrollment duration, starting and ending dates, and roles

Site Administrator

- Backup and restore functions
 - Set up automated backups for all courses
 - Manually backup and restore courses
 - Transfer sites or content between servers
- Security & privacy
 - Set site-wide password policy
 - Manage data retention, user consent, and privacy policies
 - Restrict IP access or access times

Manager

- Can be assigned as site-wide or category-wise
- Course and category management
 - View and manage all courses in the assigned category
 - Create, edit, and delete courses within the category
 - Reuse course templates
 - Set course visibility
 - Managing categories and subcategories
 - Edit course content (even without being enrolled)

Manager

- Teachers and students management
 - Assign teachers and non-editing teachers to courses
 - Manage enrolling students in courses
 - Suspend or remove users from courses
 - View user profiles and activity reports
- User support and monitoring
 - Assist teachers with uploading resources
 - Review course progress, completion, and student logs

Course Creator

- Can be assigned as site-wide or category-wise
- Course creation
 - Create new courses (automatically enrolls as teacher)
 - Define course settings
 - Set course start and end dates
 - Customize the course layout and sections

Course Creator

- Course management
 - Add and organize resources and activities
 - Set course completion criteria
 - Monitor and track student progress
- User management
 - Assign non-editing teachers to courses
 - Manage enrolling students in courses

Manager (inside course)

- In-course role for managing the course
- Course settings management
 - Define course settings
 - Set course start and end dates
 - Customize the course layout and sections
 - Control the course visibility

Manager (inside course)

- Managing course activities
 - Add and organize resources and activities
 - Control the activity settings (e.g., due dates)
 - Set course completion criteria
- User management
 - Assign teachers and non-editing teachers to courses
 - Manage enrolling students in courses
 - Suspend or remove users from courses

Manager (inside course)

- Grading and feedback
 - Grade assignments and quizzes
 - Provide feedback on assignments and quizzes
 - Set up grading methods (Letter, Points, Rubrics)
- Reporting and monitoring
 - View activity reports
 - Track student progress with course completion tracking
 - Use grade reports to analyze student performance

Teacher

- Main role in a course
- Managing course activities
 - Add and organize resources and activities (show/hide)
 - Control the activity settings (e.g., due dates)
 - Set course completion criteria
- User management
 - Assign non-editing teachers to courses
 - Manage enrolling students in courses

Teacher

- Grading and feedback
 - Grade assignments and quizzes
 - Provide feedback on assignments and quizzes
 - Set up grading methods (Letter, Points, Rubrics)
- Reporting and monitoring
 - View activity reports and logs
 - Track student progress with course completion tracking
 - Use grade reports to analyze student performance

Non-editing teacher

- Additional role that focuses on grading
- Review course activities
 - View resources and activities
 - View hidden resources and activities
 - View course completion of students
- Review users
 - View enrolled users
 - View user activities

Non-editing teacher

- Grading and feedback
 - Grade assignments and quizzes
 - Provide feedback on assignments and quizzes
- Reporting and monitoring
 - View activity reports and logs
 - Track student progress with course completion tracking
 - Use grade reports to analyze student performance

Student

- The most common role in moodle courses
- Course activities
 - View resources and activities
 - Submit assignments
 - Attempt quizzes
 - View course completion of themselves
 - Post in forums

Student

- Grades and feedback
 - View grades and feedback when available
- Self-management
 - Track deadlines via calender
 - Edit personal profile

Guest

- Read-only access
 - View course content if enabled by a teacher/admin
 - No participation (e.g., cannot post in forums or submit work)

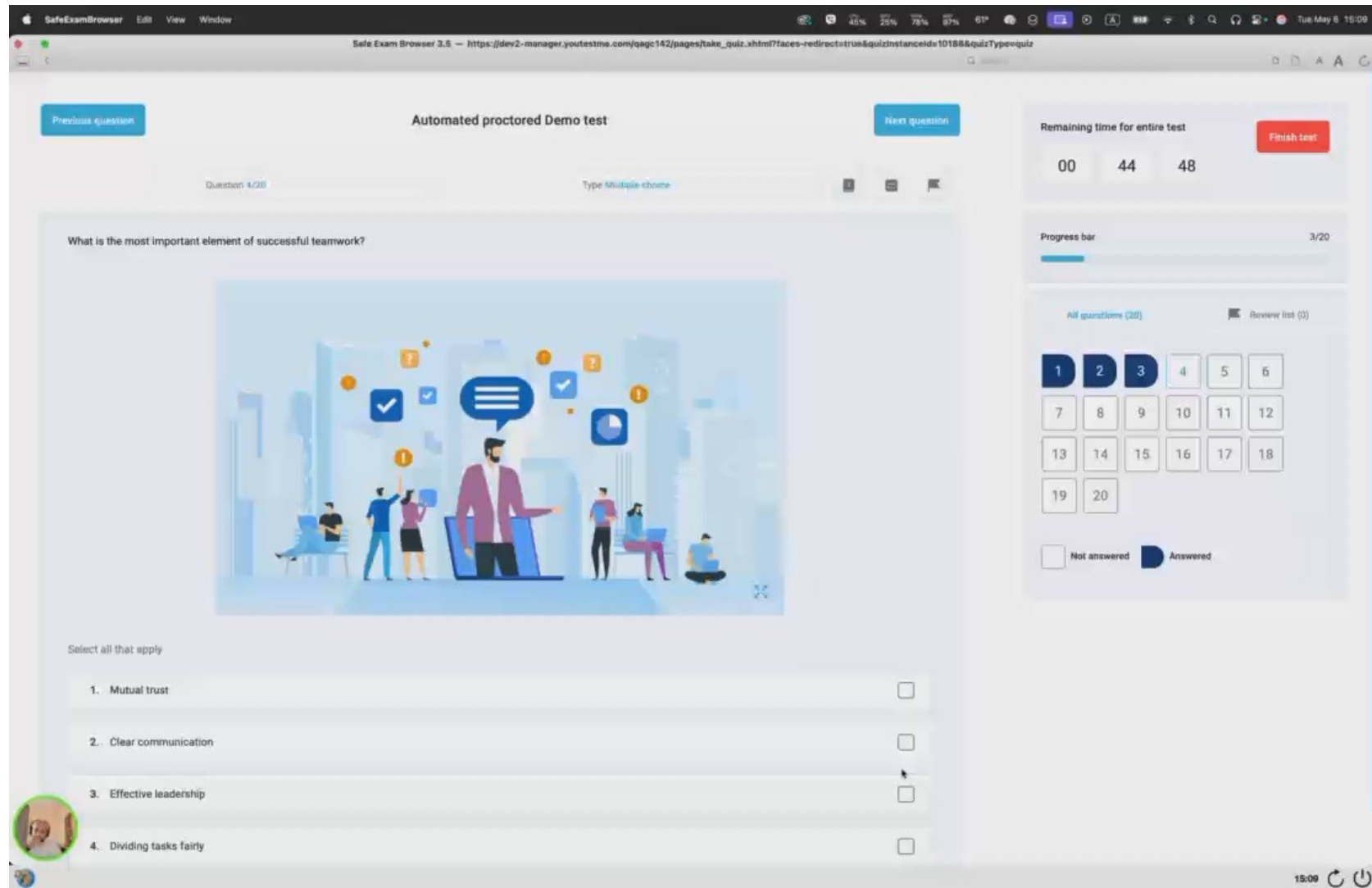
Plugins

- There are over 2000 plugins available for moodle which can be installed from <https://moodle.org/plugins/index.php>
- We will discuss few useful plugins in there
 - Safe Exam Browser
 - Interactive content
 - Virtual Programming Lab
 - Board plugin
 - Mass Enrolments
 - Workplace Course Certificate
 - Checklist plugin
 - Completion Progress plugin
 - Attendance Activity Plugin

Safe Exam Browser (SEB)

- A secure browser environment that locks down student devices during assessments, preventing misconducts.
- Available as a built-in after moodle 3.9
- Key features and configurations:
 - Students will only be able to attempt the quiz if they are using SEB
 - The browser window won't have a URL or search field and navigation
 - SEB cannot be closed until the test is submitted
 - Switching to other applications is disabled
 - Shortcut keys such as Win+Tab, Alt+Tab, Ctrl+Alt+Del, Alt+F4 are disabled
 - The browser context menu is disabled

Safe Exam Browser (SEB)



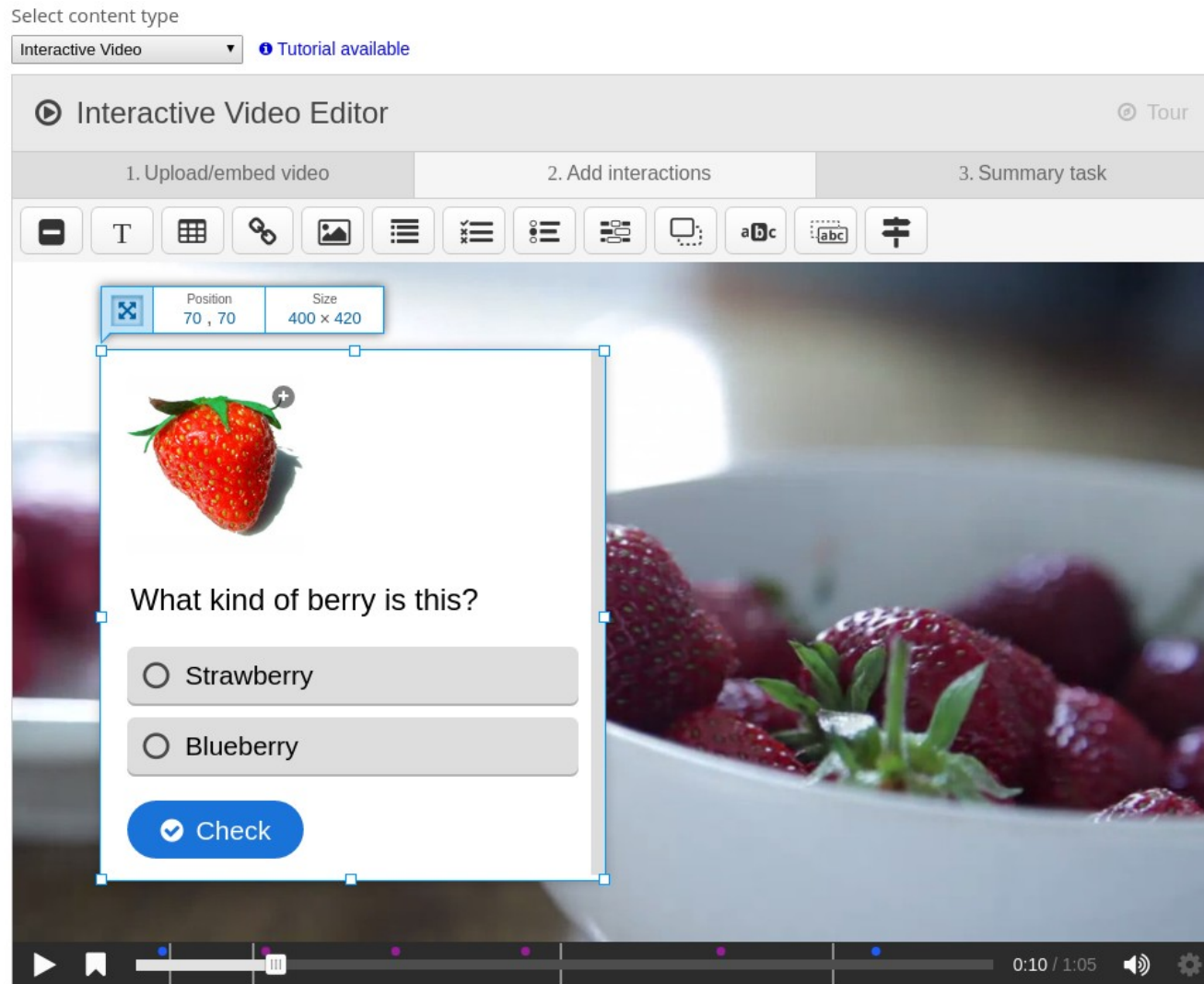
Interactive Content (H5P)

- H5P (HTML5 Package) is a plugin that allows to create and share interactive content directly inside Moodle, without needing any programming skills
- Key features:
 - Over 50 interactive formats
 - Interactive Video
 - Drag & Drop
 - Image Hotspots
 - Crosswords
 - Branching scenarios and etc.

Interactive Content (H5P)

- Key features:
 - Links to moodle's gradebook
 - Save and reuse content across courses
 - Real-time feedback
 - Use shareable content created by others
- Sample scenarios
 - Interactive Video → embedded questions in lectures
 - Drag & Drop → matching exercises
 - Branching Scenarios → decision-making simulations



Interactive Content (H5P)










Virtual Programming Lab (VPL)











- Virtual Programming Lab (VPL) is a moodle plugin that allows students to write, run, and test code directly within moodle, supporting automated evaluation and real-time feedback
- Key features:
 - Edit the program source code in the browser
 - Students can run interactive programs in the browser
 - Can run tests to review the programs
 - Allows searching for similarity between files
 - Allows setting editing restrictions and avoiding external text pasting
 - Default run and debug scripts are used for many programming languages (Ada, C, C++, C#, Fortran, Haskell, Java, Matlab/Octave, Pascal, Perl, PHP, Prolog, Python, Ruby, Scheme, SQL and VHDL)


Virtual Programming Lab (VPL)

 VPL 3 Demo English (en) 

  Student Two 

 Description  Submission  Edit  Submission view

     57     

quad.cpp 

```
1 #include <stdio.h>
2 #include <math.h>
3
4 int main(void) {
5     double a, b, c;
6     scanf("%lf%lf%lf", &a, &b, &c);
7     double d = b * b - 4 * c; // Error here
8     if (d < 0) {
9         printf("Error");
10    } else {
11        double par = sqrt(d);
12        double r1 = (-b + par) / 2 / a;
13        double r2 = (-b - par) / 2 / a;
14        printf("%lf %lf", r1, r2);
15    }
16 }
```

Proposed grade: 75 / 100

Comments

Failed tests
Test 1: Two different roots
Test 7: Imaginary roots
Test 1: Two different roots
Incorrect program output
--- Input ---
10
20
-30

--- Program output -
--
0.140175 -2.140175

--- Expected output

Description

Board Plugin

- A Kanban-style collaboration board for task management within moodle
- Key features:
 - Participants can add posts with text, images, or links
 - Teachers can define column headers
 - Rate or star someone else's post
 - Drag-and-drop columns (e.g., "To Do," "In Progress")
 - Support anonymous posting

Board Plugin

Classroom management resources - share your findings

Recommended books

A teaching 'Classic'

A popular book by a UK author with tips for teachers of high school students.

[Getting the buggers to behave](#)

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New thinking about teaching

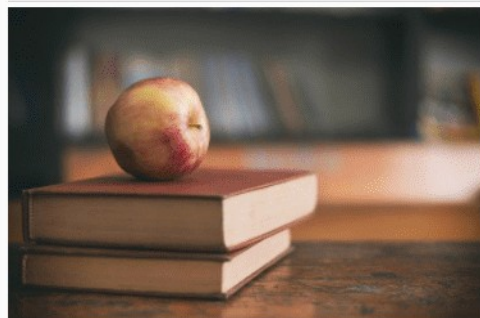
Covers many issues, not only behaviour related.

[The Future of Teaching and the Myths that Hold it Back](#)

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An Apple for the student

Newly released book on encouraging good behaviour.



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Videos

Advice from Dr Bill Rogers

Video from behaviour guru Dr Bill Rogers.



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Routines to engage learners

Short and focused video with helpful tips for new teachers.



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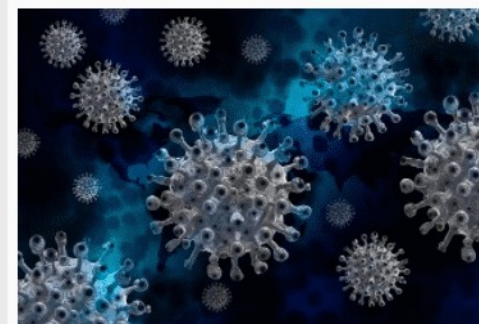
Research papers

New 2021 study

Recently released paper on behaviour in online teaching during lockdown 2020

[COVID and online behaviour](#)

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Study from 2012

Research from Malaysian universities

[Effective classroom management](#)

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Workplace Course Certificate

- Automatically generates a certificate upon course completion or meeting a criteria
- Key features:
 - Customizable PDF templates with drag-and-drop designer (logos, signatures, QR)
 - Automatically issue on course completion or meeting a specific criteria
 - Able to manually issue certificates
 - Verification of the certificate using QR codes

Workplace Course Certificate

Template Details Issued certificates

Template

+ New page

▼ Page 1



- + Background image
- + This certificate is awarded to
- + User name
- + For completing the course
- + Course full name
- + Awarded on
- + Issued date
- + QR code
- + Signature
- + Mary Jones
- + Director
- + Logo

Add element



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Checklist Plugin

- List of tasks that students can mark their completion
- Key features:
 - Tasks can be added manually or import from course activities
 - Students can check off their tasks
 - Teachers can view student progress
 - Progress bar of completion status for the tasks

Checklist Plugin

[java,C,C++,Php](#) / / Week 3 Checklist - Network Security Fundamentals

Week 3 Checklist - Network Security Fundamentals

Complete each item below by the end of Week 3. Some items will be automatically checked off as you complete them

All items:



- ☒ Read Chapter 3: Network Security Basics
- ☐ Watch the Lecture: 'Introduction to Firewalls and Encryption'
- ☒ Explore Interactive Lab: Configure a Basic Firewall
- ☐ Participate in the 'Threat Assessment Case Study' Discussion
- ☐ Complete the Week 3 Quiz: Network Security Fundamentals
- ☒ Submit Reflection: 'Why is Encryption Important?'

Completion Progress Plugin

- A block that provides a visual overview of progress through course activities
- Key features:
 - Shows a horizontal progress bar with colour-codes
 - Reflects course completion settings
 - Sorts activities by due date to highlight urgency
 - Teachers can view each student's progress
 - Add additional conditions for the completion

Completion Progress Plugin



Overview of students

Role Student

First name All A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

Last name All A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

First name [▲] / Last name		Last in course	Completion Progress	Progress
<input type="checkbox"/>	aT aparna Thewarapperuma	Thursday, 31 October 2024, 10:11 PM	<div><div></div></div>	0%
<input type="checkbox"/>	Id lakmal darmasena	Wednesday, 6 November 2024, 2:38 PM	<div><div></div></div>	40%
<input type="checkbox"/>	ID lalantha Dhammika	Never	<div><div></div></div>	0%



Attendance Activity Plugin

- Plugin for managing student attendance inside moodle
- Key features:
 - Record attendance for each class session
 - Customizable attendance statuses
 - Automatically calculates attendance percentages
 - Supports multiple sessions and recurring events
 - Exportable attendance reports

Attendance Activity Plugin

bm-01 / Attendance / Attendance



ATTENDANCE

Attendance

[Attendance](#) [Settings](#) [Report](#) [Import](#) [Export](#) [More ▾](#)

Mark as done

Upload attendance by CSV

24 November 2023 12AM

Regular class session

Page 1 of 1

View mode

Sorted list ▾

25 ▾

First name / Last name

Email address

P L E A

Remarks

Set status for

unselected ▾

☐ ☐ ☐ ☐

MB Mahela Bandara

mahela@learn.ac.lk

☒ ☐ ☐ ☐

YR Yojitha Ruwan

yojitha@learn.ac.lk

☐ ☒ ☐ ☐

Save and show next page

Present = 0

Late = 0

Excused = 0

Absent = 0

?



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Bulk Course Enrolments

- Mass enrolment plugin can be used to add students and teachers to a course in bulks
 - Teacher/Manager can create a CSV (Comma Seperated Values) file including student/teacher usernames (ex: using google forms, etc.)
 - From mass enrollment plugin, the CSV can be uploaded with relevant columns
 - Can also unenroll users in bulk
 - Detects and skips invalid users or courses
 - Generates reports on enrollment results

Bulk Course Enrolments

Bulk enrolments

[Bulk unenrolments](#)

Bulk enrolments

With this option you are going to enrol a list of known users from a file with one account per line

Empty lines or unknown accounts will be skipped.

The file may contains several columns, separated by a comma, a semi-column or a tabulation.

Every relevant column **must** be mapped; see the "Mappings" section in the form below.

You may repeat this operation at will without damages, for example if you forgot the group for some users.

[Collapse all](#)



File location



Choose a file...



You can drag and drop files here to add them.

CSV separator

,

Encoding

UTF-8

CSV Enclosure

"



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Backup and Restore

- Backup
 - Moodle backups are course-specific
 - The .mbz file contains course content, activities, and optionally user data (zip with extension changed)
- Restore
 - Restoring will recreate the course exactly as it was at backup time
 - When restoring to an existing course, there are merge options (overwrite, new course, merge)

LEARN's role

- Maintenance of moodle service.
- Creating moodle instances for each faculty.
- Assigning managers for each instance.
- Managing plugins (install on request).
- Manage user authentication methods.
- Update of the moodle system and plugins.

Representative's role

- Creating and managing courses.
- Assigning teachers to courses.
- Enrolling students to courses.
- Uploading content to courses.
- Generate certificates for completion.
- Manage grading and other academic activities.
- Adding and managing assessments etc.
- Maintaining up to date backups of moodle. (on their own storage)

Moodle : Tasks in Workshop

- You need to do followings
 - Hosting (Web / Local)
 - Local Hosting with VirtualBox (v7.0) + OVA file
 - LMS administration
 - Managing users (Manual, self and bulk adding and management)
 - Managing courses (Creating and adding students)
 - Moodle webinar (using VCR)
 - Safe Exam Browser
 - Email service configuration

Moodle : Tasks in Workshop

- Educator tasks
 - Managing contents, assignments and quizzes
 - Creating and Managing forums
 - Attendance and reports
 - Grading and feedback
- Plugins
 - Interactive content plugin
 - Virtual Programming Lab - VPL
 - Board plugin
 - Workplace course certificate
 - Checklist plugin
 - Completion progress plugin

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Thank You!



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