

학습분석 개요

2024.5.29. 전대일

오늘의 교육 내용

- 오전 - 학습분석 개요 (이론 강좌)
 - 학습분석 기본 개념 이해
 - 학습활동로그 데이터 특성 이해(Caliper? xAPI?)
 - 교육 IT 시스템 개요
- 오후 - 오픈소스 학습관리시스템(LMS) 활용 학습활동 데이터 모의 생성
 - Moodle LMS 설치
 - 강좌 및 학생 모의 생성
 - 모의 학습활동 로그 생성
 - 탐색적 분석 및 결과 발표

* 비교: 내일부터 4일간 실제 천재교육 밀크티 샘플 데이터 활용 실습

학습분석 개념 강좌

PDF 자료 첨부

활동로그 강의: 활동로그분석이란?

- 다양한 분야에서 다양한 용어로 사용된다.
- UAM(User Activity Monitoring)/UBM(User Behavior Monitoring)
- Clickstream Analysis
- 가트너의 용어 정의:
<https://www.gartner.com/en/information-technology/glossary/clickstream-analysis>
- Event Stream: <https://www.youtube.com/watch?v=hMWyE3HBwW4> (특히 7:32초 비교표 참조)
- Activity Stream
- 비교: 동영상 스트리밍과는 다른 개념!

활동로그 강의: Google, Adobe

- 구글애널리틱스 6분내로 끝내기

<https://www.youtube.com/watch?v=9uQC6qz3NG8>

- Adobe Analytics: <https://www.youtube.com/watch?v=Y2Jo43NM-Oo>

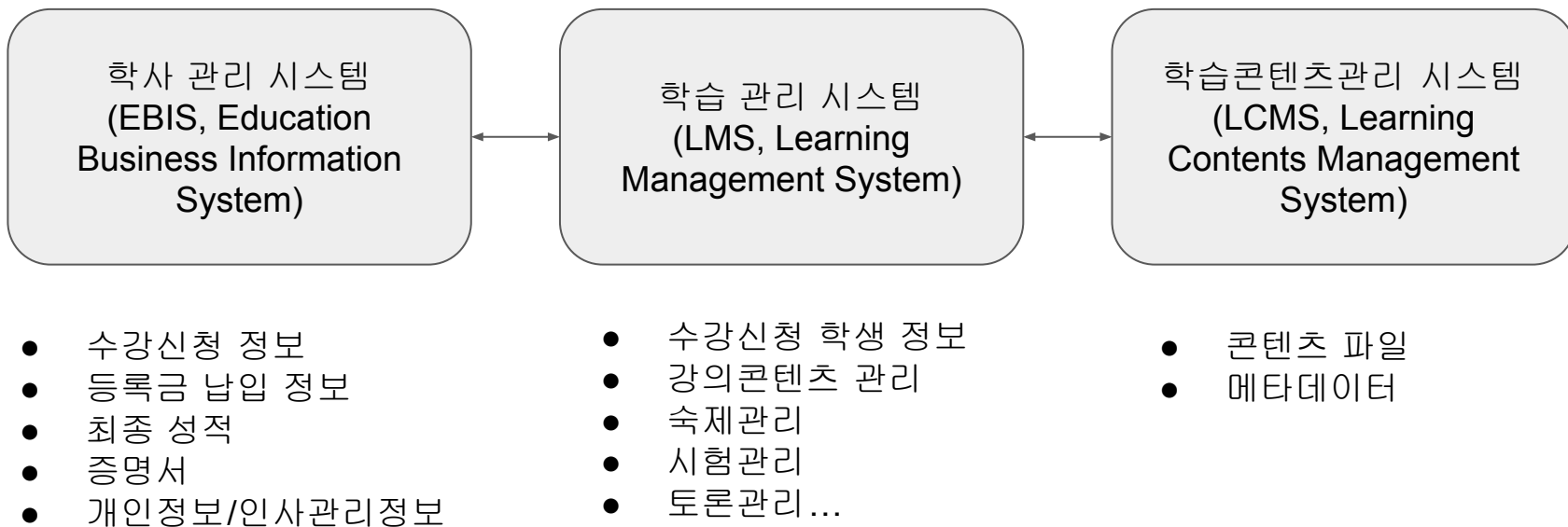
활동로그 강의: Activity Streams

- W3C 표준 : <https://www.w3.org/TR/activitystreams-core/>
- 표준 구현 예제: <https://www.w3.org/2010/05/video/mediaevents.html>

활동로그 강의: 학습분석 도메인

- Learning Analytics in a nutshell <https://youtu.be/XscUZ8dla-8>
- xAPI :
https://xapi.com/overview/?utm_source=google&utm_medium=natural_search
- xAPI 설명 자료(한국 개발자):
<https://www.youtube.com/watch?v=G4usWOI00Nk>
- IMS Caliper: <https://www.imsglobal.org/activity/caliper>

교육 IT



Moodle LMS 윈도우 설치 및 학습활동 데이터 모의 생성

전대일

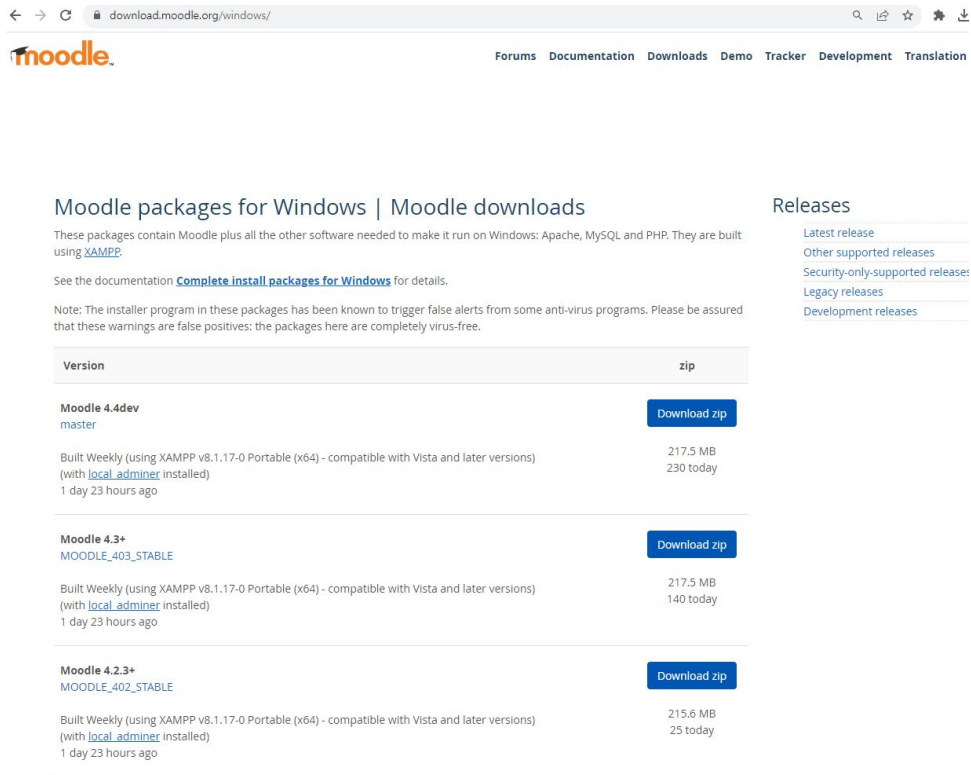
다운로드 주소

- 검색: “moodle windows installer”

- 주소:

<https://download.moodle.org/windows/>

- Stable 버전 권장



The screenshot shows the Moodle Downloads page for Windows. The page title is "Moodle packages for Windows | Moodle downloads". Below the title, there is a paragraph explaining that the packages contain Moodle plus all the other software needed to make it run on Windows: Apache, MySQL and PHP. They are built using XAMPP. A link to the documentation "Complete install packages for Windows" is provided for details. A note states that the installer program has been known to trigger false alerts from some anti-virus programs, but that these warnings are false positives and the packages are completely virus-free.

The main content is a table with two columns: "Version" and "zip". There are three rows of data, each representing a different Moodle version. Each row has a "Download zip" button next to the "zip" column.

Version	zip
Moodle 4.4dev master	Download zip
Built Weekly (using XAMPP v8.1.17-0 Portable (x64) - compatible with Vista and later versions) (with local_adminer installed) 1 day 23 hours ago	217.5 MB 230 today
Moodle 4.3+ MOODLE_403_STABLE	Download zip
Built Weekly (using XAMPP v8.1.17-0 Portable (x64) - compatible with Vista and later versions) (with local_adminer installed) 1 day 23 hours ago	217.5 MB 140 today
Moodle 4.2.3+ MOODLE_402_STABLE	Download zip
Built Weekly (using XAMPP v8.1.17-0 Portable (x64) - compatible with Vista and later versions) (with local_adminer installed) 1 day 23 hours ago	215.6 MB 25 today

On the right side of the page, there is a "Releases" section with links to "Latest release", "Other supported releases", "Security-only-supported releases", "Legacy releases", and "Development releases".

압축 해제

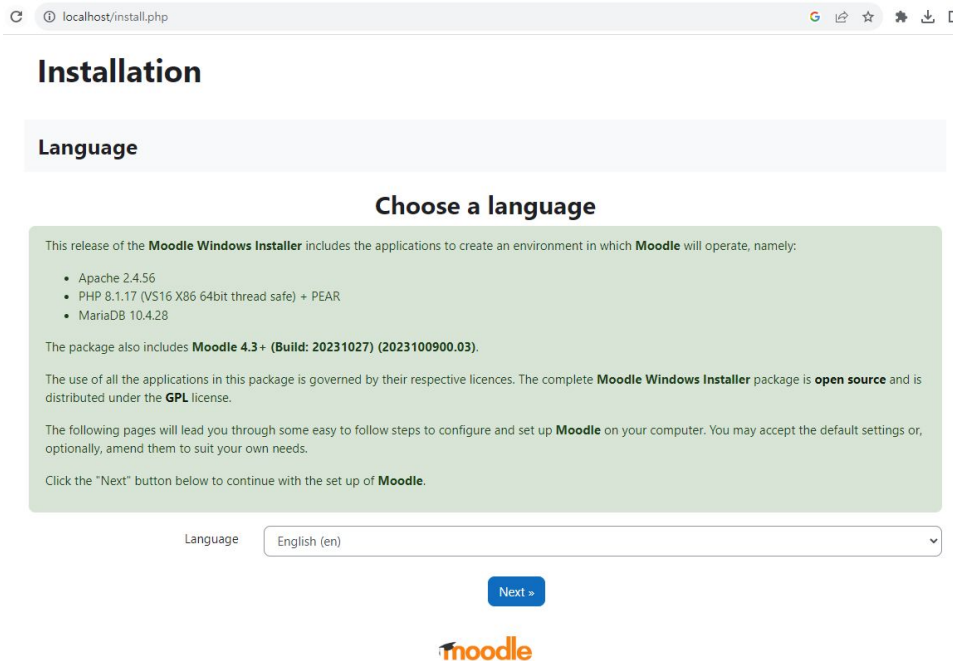
- 설치 원하는 위치에서 압축풀기
- 10~20분 소요
- Server 폴더에 구성요소 설치됨
- 압축 해제 후 **Start Moodle.exe** 실행시 설치 프로세스 시작
- 서버 중단시 **Stop Moodle.exe** 활용 권장

다운로드 > MoodleWindowsInstaller-latest-403

이름	수정한 날짜	유형	크기
오늘			
README.txt	2023-10-29 오전 10:00	텍스트 문서	3KB
Start Moodle.exe	2023-10-29 오전 10:00	응용 프로그램	25KB
Stop Moodle.exe	2023-10-29 오전 10:00	응용 프로그램	16KB
server	2023-10-29 오전 10:00	파일 폴더	

설치 시작

- Start moodle.exe 하면 CMD에서 실행확인후 브라우저에서 <http://localhost/> 접속
- 언어 선택
- Next 클릭



코드 및 데이터 경로 설정

- Moodle Directory: 코드 설치
- Data Directory: 운영 데이터 저장 위치

Installation

Paths

Confirm paths

Web address

The full address where Moodle will be accessed i.e. the address that users will enter into the address bar of their browser to access Moodle.

It is not possible to access Moodle using multiple addresses. If your site is accessible via multiple addresses then choose the easiest one and set up a permanent redirect for each of the other addresses.

If your site is accessible both from the Internet, and from an internal network (sometimes called an Intranet), then use the public address here.

If the current address is not correct, please change the URL in your browser's address bar and restart the installation.

Moodle directory

The full path to the directory containing the Moodle code.

Data directory

A directory where Moodle will store all file content uploaded by users.

This directory should be both readable and writeable by the web server user (usually 'www-data', 'nobody', or 'apache').

It must not be directly accessible over the web.

If the directory does not currently exist, the installation process will attempt to create it.

Web address

http://localhost

Moodle directory

C:\Users\daei\Downloads\MoodleWindowsInstaller-latest-403\server\moodle

Data directory

C:\Users\daei\Downloads\MoodleWindowsInstaller-latest-403\server\moodledata

« Previous Next »



DB 설치

- 중요! 계정 정보 기록
- 캡처 또는 별도 기록 바람

Installation

Database

Database settings

MariaDB (native/mariadb)

The database is where most of the Moodle settings and data are stored and must be configured here.

The database name, username, and password are required fields; table prefix is optional.

The database name may contain only alphanumeric characters, dollar (\$) and underscore (_).

If the database currently does not exist, and the user you specify has permission, Moodle will attempt to create a new database with the correct permissions and settings.

This driver is not compatible with legacy MyISAM engine.

Database host

Database name

Database user

Database password

Tables prefix

Database port

[< Previous](#)[Next >](#)

사용권 동의

- 중요! 계정 정보 기록
- 캡처 또는 별도 기록 바람

Installation

Moodle - Modular Object-Oriented Dynamic Learning Environment

Copyright notice

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This program is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.

See the Moodle License information page for full details: <https://moodledev.io/general/license>

Confirm

Have you read these conditions and understood them?

Cancel

Continue

설치 진단 화면

- 설치 안되는 구성요소 표시
- PC 환경마다 달라서 각자 문제해결 필요
 - Php sodium: 커뮤니티 게시판 확인하여 관련 dll 복사 후 서비스 종료(Moodle Stop.exe) 후 재시작
- 노란색은 설치가능

Installation - Moodle 4.3+ (Build: 20231027)

Moodle 4.3+ (Build: 20231027)

For information about this version of Moodle, please see the online [Release Notes](#)

Server checks

Name	Information	Report	Plugin	Status
php_extension	sodium	must be installed and enabled		
unicode		must be installed and enabled		
database	mariadb (10.4.28-MariaDB)	version 10.4 is required and you are running 10.4.28		
php		version 8.0.0 is required and you are running 8.1.17		
pcreunicode		should be installed and enabled for best results		
php_extension	iconv	must be installed and enabled		
php_extension	mbstring	must be installed and enabled		
php_extension	curl	must be installed and enabled		
php_extension	openssl	must be installed and enabled		
php_extension	tokenizer	should be installed and enabled for best results		
php_extension	soap	should be installed and enabled for best results		
php_extension	ctype	must be installed and enabled		
php_extension	zip	must be installed and enabled		
php_extension	zlib	must be installed and enabled		
php_extension	gd	must be installed and enabled		
php_extension	simplexml	must be installed and enabled		
php_extension	spl	must be installed and enabled		

...

php_setting	opcache.enable	recommended setting detected		
-------------	----------------	------------------------------	--	--

Other checks

Information	Report	Plugin	Status
site not https	if this test fails, it indicates a potential problem It has been detected that your site is not secured using HTTPS. It is strongly recommended to migrate your site to HTTPS for increased security and improved integration with other systems.		

You must solve all the environmental problems (errors) found above before proceeding to install this Moodle version!

Reload

설치 진행 화면

- 서버 구성 요소 설치 진행
- 스크롤 다운으로 조회가능
- 모두 설치 시 하단에 계속 버튼

Installation

System

Success (35.02 seconds)

antivirus_clamav

Success (0.16 seconds)

availability_completion

Success (0.16 seconds)

availability_date

Success (0.17 seconds)

availability_grade

Success (0.18 seconds)

availability_group

Success (0.17 seconds)

availability_grouping

Success (0.16 seconds)

...

factor_totp

Success (0.17 seconds)

factor_webauthn

Success (0.18 seconds)

Continue

LMS 어드민 계정 프로파일

- 아이디, 비번 등 별도 기록 필요

Installation

On this page you should configure your main administrator account which will have complete control over the site. Make sure you give it a secure username and password as well as a valid email address. You can create more admin accounts later on.

[Expand all](#)

General

Username

admin

Choose an authentication method

Manual accounts

New password

Kdigital@2023

The password must have at least 8 characters, at least 1 digit(s), at least 1 lower case letter(s), at least 1 upper case letter(s), at least 1 special character(s) such as *, -, or #

The password must have at least 1 special character(s) such as *, -, or #.

☐ Force password change

First name

Admin

Last name

User

Email address

daeil@chunjae.co.kr

Email visibility

Visible to everyone

City/town

Select a country...

Timezone

Server timezone (Australia/Perth)

Description

LMS 사이트 설정

- 사이트 이름
- 지역/시간대
- 운영중 변경가능

Installation

New settings - Site home settings

Full site name
fullname My School LMS

Short name for site (eg single word)
shortname mylms

Site home summary
summary

Edit View Insert Format Tools Table Help

↶ ↷ B I H-P 🔗 🌐 📑 ☰ ☷ ☹ ☹ ☹ ☹ ☹ ☹ ☹

p 0 words tiny

This summary can be displayed on the site home using the course/site summary block.

New settings - Location settings

Default timezone
timezone Asia/Seoul Default: Australia/Perth

This is the default timezone for displaying dates - each user can override this setting in their profile. Cron tasks and other server settings are specified in this timezone. You should change the setting if it shows as "invalid timezone"

설치 완료

- 기본 설치 완료
- 종료/재시작 시 다운로드 폴더의
exe 활용 권장
- 각자 메뉴 네비게이션~!

Welcome, Admin! 🙌



Course overview



Create your first course

Need help getting started? Check out the [Moodle documentation](#) or take your first steps with our Quickstart guide.

[View Quickstart guide](#)

[Create course](#)

강좌 개설

- 강좌명 입력
- 강좌개설기간 설정
- 분류코드: 임의 설정

[Courses](#) / [Category 1](#) / [Manage courses and categories](#) / [Add a new course](#)

Category 1

[Category](#) [Settings](#) [More](#) ▾

Add a new course

[Expand all](#)

▼ General

Course full name ⓘ ⓘ

학습분석 기초

Course short name ⓘ ⓘ

학습분석

Course category ⓘ ⓘ

× Category 1

Search ▾

Course visibility ⓘ

Show ▾

Course start date ⓘ

30 ▾

October ▾

2023 ▾

00 ▾

00 ▾



Course end date ⓘ

☒ Enable

29 ▾

October ▾

2024 ▾

00 ▾

00 ▾



Course ID number ⓘ

CS001

▼ Description

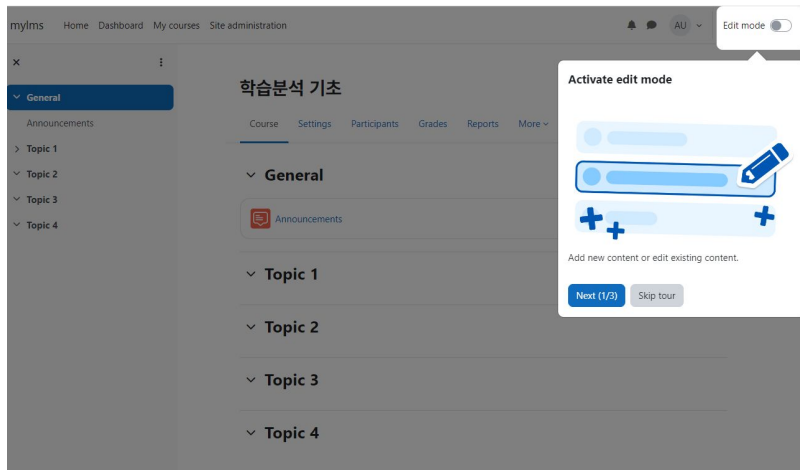
Course summary ⓘ

Edit View Insert Format Tools Table Help

↶ ↷ B I

강좌 내 학습 콘텐츠 추가 #1

- 강좌 홈 우상단 Edit Mode 활성화



- 차시별, 주제별 학습 콘텐츠 추가

학습분석 기초

Bulk actions

Course Settings Participants Grades Reports More ▾

General

Collapse all

Announcements

Add an activity or resource

Add topic

Topic 1

Add an activity or resource

Add topic

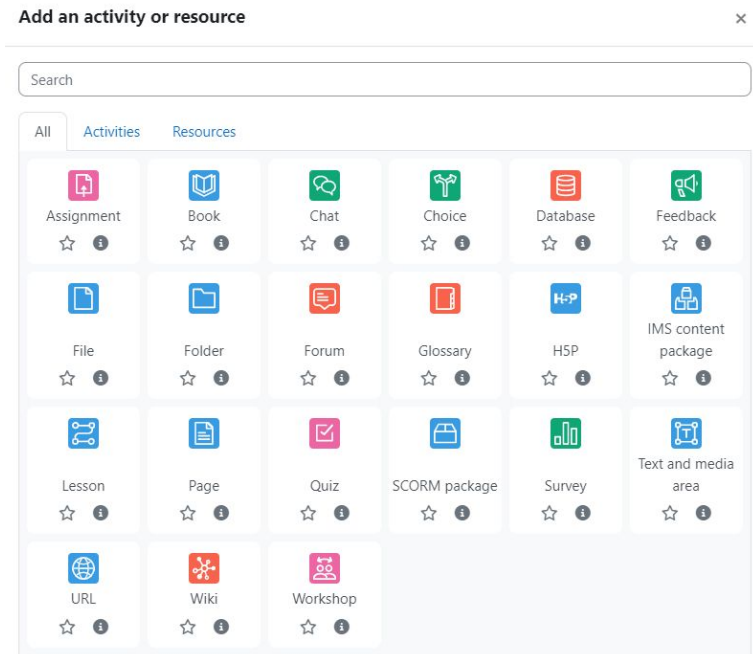
Topic 2

Add an activity or resource

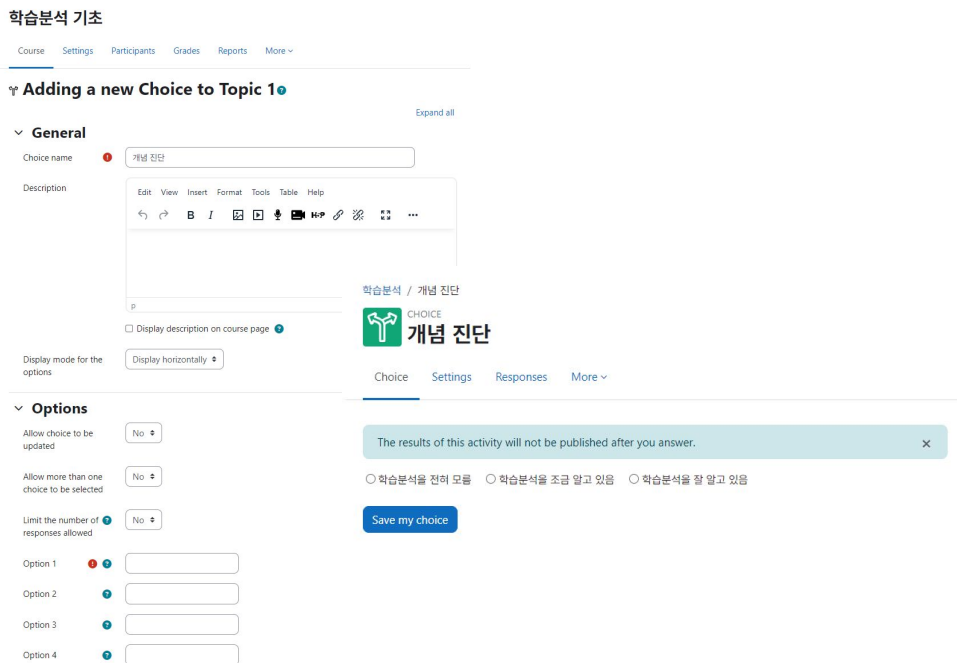
Add topic

강좌 내 학습 콘텐츠 추가 #2

- ## ● 학습활동 유형 선택



- 간단한 설문 추가



학습자 생성

- Site Admin > Users > Add a new user
- 이메일은 가상으로 아무거나 입력

The screenshot displays the Moodle LMS Site Administration interface. The top navigation bar includes links for mylms, Home, Dashboard, My courses, and Site administration. The 'Site administration' section is expanded, showing sub-links for General, Users, Courses, Grades, Plugins, Appearance, Server, Reports, and Development. The 'Users' sub-link is selected, leading to the 'Accounts / Add a new user' page. The page title is 'My School LMS'. The left sidebar lists various user management tasks: Browse list of users, Bulk user actions, Add a new user, User management, User default preferences, User profile fields, Cohorts, Cohort custom fields, Upload users, and Upload user pictures. The main content area is divided into three sections: 'Accounts', 'Permissions', and 'Privacy and policies'. The 'General' section is expanded, showing the 'Add a new user' form. The form includes fields for Username (learner001), Choose an authentication method (Manual accounts), New password (Click to enter text), First name (Learner), Last name (First), Email address (learner@learner.abc), Email visibility (Visible to course participants), MoodleNet profile ID, and City/town. The form also includes checkboxes for 'Suspended account' and 'Generate password and notify user'.

← → localhost/admin/search.php#linkusers

mylms Home Dashboard My courses Site administration

Site administration

General Users Courses Grades Plugins Appearance Server Reports Development

Accounts / Add a new user

My School LMS

General Users Courses Grades Plugins Appearance Server Reports Development

Expand all

▼ General

Username ⓘ learner001

Choose an authentication method ⓘ Manual accounts ▾

☐ Suspended account ⓘ

☐ Generate password and notify user

The password must have at least 8 characters, at least 1 digit(s), at least 1 lower case letter(s), at least 1 upper case letter(s), at least 1 special character(s) such as *, -, or #

New password ⓘ Click to enter text ⓘ

☐ Force password change ⓘ

First name ⓘ Learner

Last name ⓘ First

Email address ⓘ learner@learner.abc

Email visibility ⓘ Visible to course participants ▾

MoodleNet profile ID ⓘ

City/town

유저 확인

- Site Admin > Users > Add a new user
- 이메일은 가상으로 아무거나 입력

Accounts / Browse list of users

My School LMS

Search

General Users Courses Grades Plugins Appearance Server Reports Development

Changes saved ×

2 Users

▼ **New filter**

User full name

Show more... Add filter

First name / Last name	Email address	City/town	Country	Last access	Edit
Admin User	daeil@chunjae.co.kr			32 secs	
Learner First	learner@learner.abc			Never	

Add a new user

유저를 강좌에 등록(Enrol)

- 강좌홈 > Participants > 수강신청 학습자 목록
- Enrol 버튼: 학생 추가
- Assign Role: 학생 역할로 추가

학습분석 기초

Course Settings Participants Grades Reports More ▾

Enrolled users ▾ Enrol users

Match Any ▾ Select ▾

+ Add condition Clear filters Apply filters

1 participants found

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	Email address	Roles	Groups	Last access to course	Status
<input type="checkbox"/>	—	—	—	—	—	—
<input type="checkbox"/>	AU Admin User	daell@chunjae.co.kr	Teacher	No groups	59 secs	Active ⓘ ⚙

With selected users... Choose... ▾

Enrol users

Enrol users

Enrolment options

Select users

Search ▾

Assign role

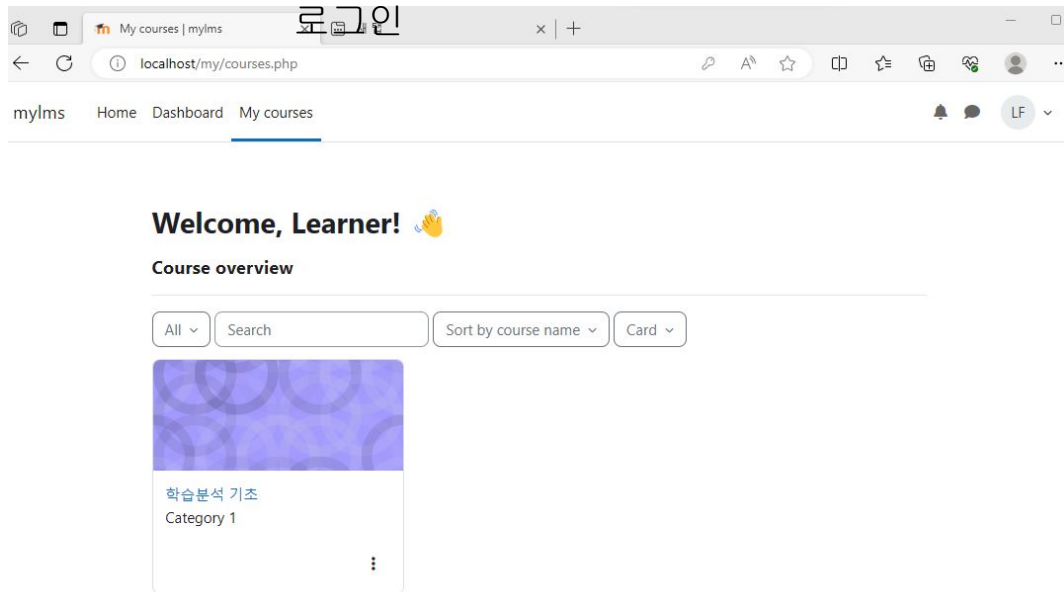
Show more...

Cancel Enrol users

유저로 강좌 활동 시작

- 브라우저 변경하여
학습사이트 접속
- 생성한 유저(학생)으로
로그인
- 생성된 강좌의 활동 수행
- 강사에게 메시지 보내기
(강좌 홈에서 참여자
목록에서 메시지 희망자
선택, 해당 프로파일
보기에서 메시지 보내기)

Edge 브라우저에서 학습자 ID로
로그인



활동 로그 #1

- 사이트 어드민 > 리포트 > 로그

mylms Home Dashboard My courses Site administration

Site administration

General Users Courses Grades Plugins Appearance Server Reports Development

Reports

Comments
Backups
Config changes
Events list
Antivirus failures
Insights
Logs
Live logs
Performance overview
Question instances
Security checks
System status
Accessibility toolkit
Event monitoring rules
Spam cleaner

Report builder

Custom reports
Custom report settings

MFA reports

All factor report

활동 로그 #2

- 사이트 어드민 > 리포트 > 로그
- Get Logs
- CSV 파일로 다운로드 가능

mylms Home Dashboard My courses Site administration

My School LMS

General Users Courses Grades Plugins Appearance Server Reports Development

Logs

My School LMS (99e) All participants All days All activities All actions All sources All events

Get these logs

Time	User full name	Affected user	Event context	Component	Event name	Description	Origin	IP address
29 October 2023, 11:31:42 AM	Learner First	Admin User	System	System	Message sent	The user with id '3' sent a message to the user with id '2'.	web	000000001
29 October 2023, 11:31:42 AM	Learner First	Admin User	System	System	Email failed to send	Failed to send an email from the user with id '3' to the user with id '2' due to the following error: "Invalid address: (From: noreply@localhost)".	web	000000001
29 October 2023, 11:31:24 AM	Learner First	Admin User	Course: 학습평가 기간	System	User profile viewed	The user with id '3' viewed the profile for the user with id '2' in the course with id '2'.	web	000000001
29 October 2023, 11:31:24 AM	Learner First	-	Course: 학습평가 기간	System	User list viewed	The user with id '3' viewed the list of users in the course with id '2'.	web	000000001
29 October 2023, 11:31:24 AM	Learner First	-	Course: 학습평가 기간	System	Course viewed	The user with id '3' viewed the course with id '2'.	web	000000001
29 October 2023, 11:31:18 AM	Learner First	-	Course: 학습평가 기간	System	User list viewed	The user with id '3' viewed the list of users in the course with id '2'.	web	000000001
29 October 2023, 11:31:17 AM	Learner First	Learner First	Course: 학습평가 기간	User report	Grade user report viewed	The user with id '3' viewed the user report in the gradebook.	web	000000001
29 October 2023, 11:31:16 AM	Learner First	-	Course: 학습평가 기간	System	Grade item updated	The user with id '3' updated a grade item from id '1' of type 'course' and name " in the course with the id '2'.	web	000000001
29 October 2023, 11:31:12 AM	Learner First	-	Course: 학습평가 기간	System	Course viewed	The user with id '3' viewed the course with id '2'.	web	000000001
29 October 2023, 11:30:37 AM	Learner First	-	Choice: 웹 접근	Choice	Course module viewed	The user with id '3' viewed the 'choice' activity with course module id '2'.	web	000000001
29 October 2023, 11:30:26 AM	Learner First	-	Forum: Announcements	Forum	Course module viewed	The user with id '3' viewed the 'forum' activity with course module id '1'.	web	000000001
29 October 2023, 11:30:21 AM	Learner First	-	Choice: 웹 접근	Choice	Course module viewed	The user with id '3' viewed the 'choice' activity with course module id '2'.	web	000000001
29 October 2023, 11:30:21 AM	Learner First	Learner First	Choice: 웹 접근	Choice	Choice answer added	The user with id '3' has added the option with id '2' for the user with id '3' from the choice activity with course module id '2'.	web	000000001
29 October 2023, 11:30:15 AM	Learner First	-	Choice: 웹 접근	Choice	Course module viewed	The user with id '3' viewed the 'choice' activity with course module id '2'.	web	000000001
29 October 2023, 11:30:09 AM	Learner First	-	Course: 학습평가 기간	User tour	Tour ended	The user with id '3' has ended the tour with id '2' at step index '0' (id '0') on the page with URL http://localhost/course/view.php?id=2.	web	000000001
29 October 2023, 11:30:07 AM	Learner First	-	Course: 학습평가 기간	User tour	Tour started	The user with id '3' has started the tour with id '2' on the page with URL http://localhost/course/view.php?id=2.	web	000000001
29 October 2023, 11:30:07 AM	Learner First	-	Course: 학습평가 기간	System	Course viewed	The user with id '3' viewed the course with id '2'.	web	000000001
29 October 2023, 11:29:16 AM	Learner First	-	System	User tour	Tour ended	The user with id '3' has ended the tour with id '4' at step index '0' (id '0') on the page with URL http://localhost/my/courses.php.	web	000000001
29 October 2023, 11:29:16 AM	Learner First	-	System	User tour	Tour started	The user with id '3' has started the tour with id '4' on the page with URL http://localhost/my/courses.php.	web	000000001
29 October 2023, 11:29:16 AM	Learner First	-	System	User tour	Tour reset	The user with id '3' has reset the state of tour with id '4' on the page with URL http://localhost/my/courses.php.	web	000000001
29 October 2023, 11:29:16 AM	Learner First	-	System	User tour	Tour ended	The user with id '3' has ended the tour with id '4' at step index '0' (id '0') on the page with URL http://localhost/my/courses.php.	web	000000001
29 October 2023, 11:29:16 AM	Learner First	-	System	User tour	Tour started	The user with id '3' has started the tour with id '4' on the page with URL http://localhost/my/courses.php.	web	000000001
29 October 2023, 11:29:16 AM	Learner First	-	System	User tour	Tour reset	The user with id '3' has reset the state of tour with id '4' on the page with URL http://localhost/my/courses.php.	web	000000001
29 October 2023, 11:29:09 AM	Learner First	-	System	User tour	Tour ended	The user with id '3' has ended the tour with id '4' at step index '0' (id '0') on the page with URL http://localhost/my/courses.php.	web	000000001

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1 2 3 4 5 6 7 8 9 10 ... 14 >

To Do

- 강의 개설
- 학습활동/자료 추가
- 학생 추가
- 강좌에 학생 등록
- 학생 로그인을 통해 활동 수행
 - 분석할 가설을 고려한 가상 활동 수행
- 활동로그 다운로드
- Pandas, Matplotlib, Seaborn, Plotly 등 분석도구를 활용하여 각자 탐색적 분석을 수행하고 발표한다.