

KTU E-Learning Technology Centres

EXPERIENCE in

Learning Analytics Tools, Technologies, Applications

Multiplier Event: We-Collab Project
Rijeka University, Croatia
9th December, 2024

Gytis Cibulskis, Ausra Urbaityte

Learning Analytics

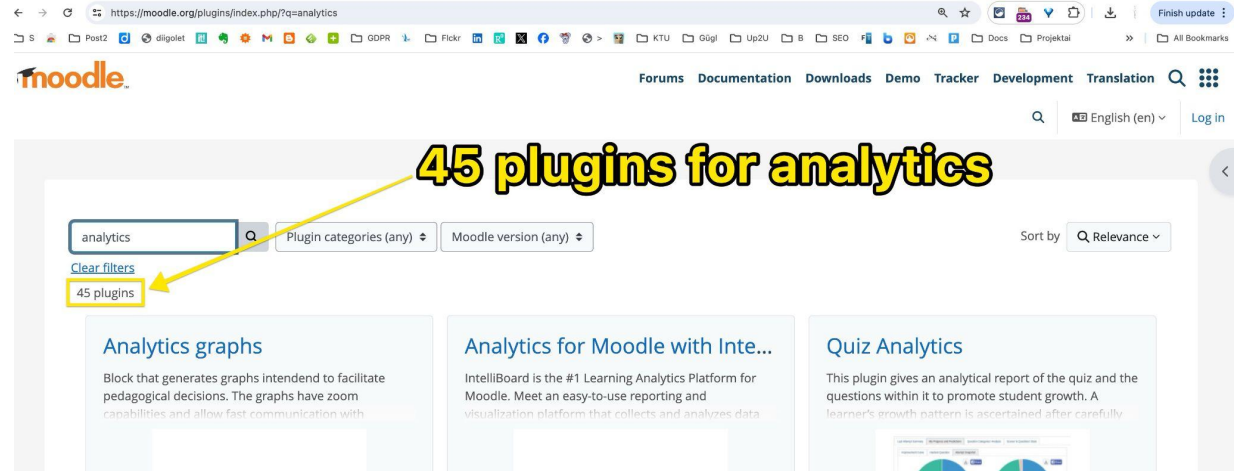
Learning analytics (LA) is the measurement, collection, analysis and reporting of data about learners in their context, for purposes of understanding and optimizing

- *learning*
- *the environment in which it occurs*



Analytics in MOODLE

- Native MOODLE Reporting functionality:
 - System level reports
 - Course level reports
 - Custom reports
- Native Machine Learning (ML) based Learning Analytics
- Different plugins and integrations



The screenshot shows the Moodle website's plugin directory for analytics. The URL in the browser is <https://moodle.org/plugins/index.php?q=analytics>. The page features a search bar with the text 'analytics' and a magnifying glass icon. Below the search bar, there are filters for 'Plugin categories (any)' and 'Moodle version (any)'. A 'Sort by' dropdown menu is set to 'Relevance'. A yellow arrow points from the text '45 plugins for analytics' to a box that says '45 plugins' under the 'Clear filters' link. The page displays three plugin cards: 'Analytics graphs', 'Analytics for Moodle with Inte...', and 'Quiz Analytics'. The 'Analytics graphs' card describes a block that generates graphs for pedagogical decisions. The 'Analytics for Moodle with Inte...' card describes the IntelliBoard platform. The 'Quiz Analytics' card describes a plugin for reporting on quiz results.

45 plugins for analytics

analytics

Plugin categories (any)

Moodle version (any)

Sort by Relevance

Clear filters

45 plugins

Analytics graphs

Block that generates graphs intendend to facilitate pedagogical decisions. The graphs have zoom capabilities and allow fast communication with

Analytics for Moodle with Inte...

IntelliBoard is the #1 Learning Analytics Platform for Moodle. Meet an easy-to-use reporting and visualization platform that collects and analyzes data

Quiz Analytics

This plugin gives an analytical report of the quiz and the questions within it to promote student growth. A learner's growth pattern is ascertained after carefully

Reports

Course overview



KTU Open Courses

General Users Courses Grades Plugins Appearance Server Reports Development

Report type

- ✓ Most active courses
- Most active courses (weighted)
- Most participatory courses (enrolments)
- Most participatory courses (posts/views)

Time period - last:

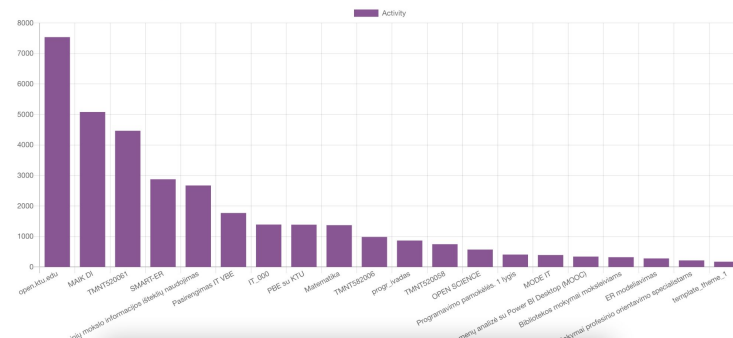
- ✓ 1 weeks
- 2 weeks
- 3 weeks
- 4 weeks
- 2 months
- 3 months
- 4 months
- 5 months
- 6 months
- 7 months
- 8 months
- 9 months
- 10 months
- 11 months
- Last year
- 2 years
- 3 years
- 4 years

20

View

Most ac

Most active courses



Open >>

Native MOODLE report builder



Attendance

[Edit details](#)[Close](#)

Editor Audience Schedules Access

- Conditions ? ▼
- Filters ? ▼
- Sorting ? ▼
- Card view ? ▼

Attendance	^
Name	+
Session description	+
Session date	+
Session duration	+
Session last taken time (teacher)	+
User session taken	+
User session status	+
User session grade	+
User session remarks	+
Number of sessions taken	+
Points over taken sessions	+
Percentage over taken sessions	+
Total number of sessions	+
Points over all sessions	+

+ COURSE • COURSE FULL NAME x	+ ATTENDANCE • NAME x	+ USER • FULL NAME x	+ ATTENDANCE • SESSION DATE x	+ ATTENDANCE • USER
Course full name ✎	Name ✎	Full name ✎	Session date ✎	User session ta
No aggregation ▼	No aggregation ▼	No aggregation ▼	No aggregation ▼	No aggregation ▼

Nothing to display
















MOODLE ML Analytics Tools



Existing analytics models:

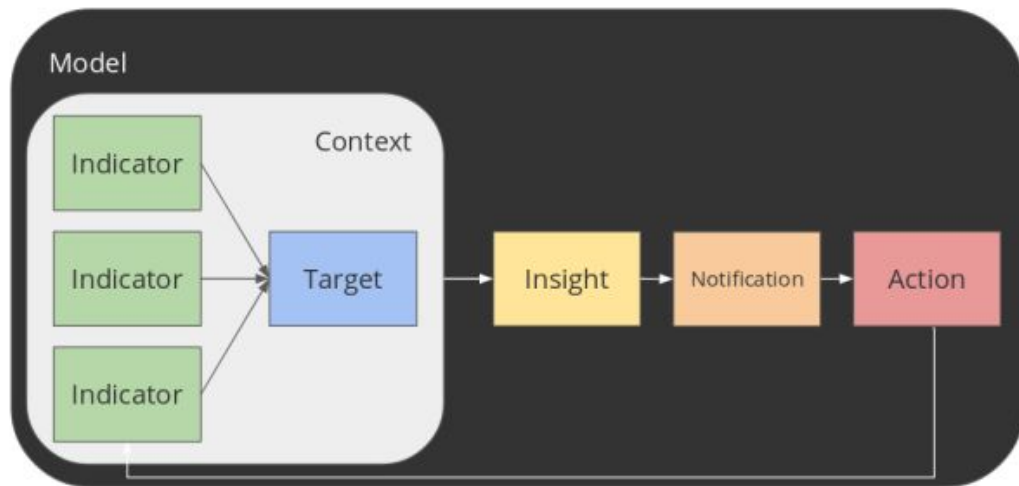
New model ▾

Analytics models

Model name	Enabled	Indicators	Analysis interval	Insights	Actions
Courses at risk of not starting  \core_course\analytics\target\no_teaching 	No	Number of indicators: 2	From start to end 	Disabled model	Actions ▾
Students at risk of dropping out  \core_course\analytics\target\course_dropout 	No	Number of indicators: 49	Not yet defined 	Disabled model	Actions ▾
Students who have not accessed the course recently  \core_course\analytics\target\no_recent_accesses 	No	Number of indicators: 1	Past month 	Disabled model	Actions ▾
Students who have not accessed the course yet  \core_course\analytics\target\no_access_since_course_start 	✓	Number of indicators: 1	One month after start 	No insights reported	Actions ▾
Upcoming activities due  \core_user\analytics\target\upcoming_activities_due 	No	Number of indicators: 1	Upcoming week 	Disabled model	Actions ▾

Create New model

- Target
 - *Students at risk of not achieving the competencies assigned to a course*
 - *Students at risk of not meeting the course completion conditions*
 - *Students at risk of dropping out*
 - *Students at risk of not achieving the minimum grade to pass the course*
- Multiple indicators (predictors)
- Analysis interval
Past 3 day / month/ week; last tenth; upcoming 3 day / month/week, no time limit,)
- Contexts (Selected course or category)
- Predictions processor

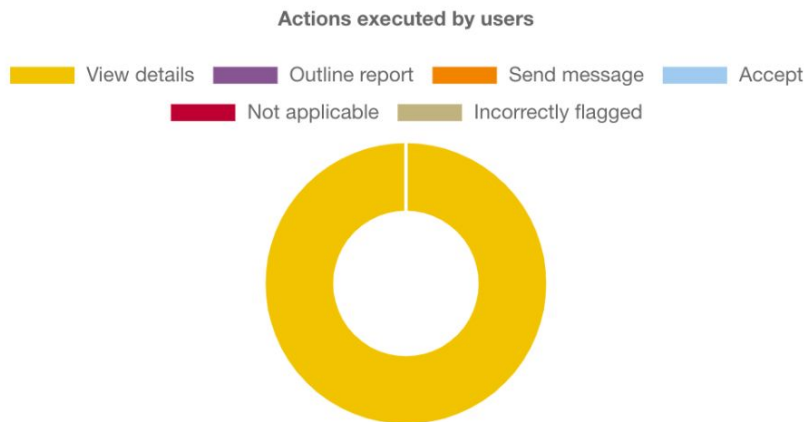


MOODLE Analytics Tools

Analytics Models example:



Actions executed by users for "Students who have not accessed the course yet" model



Show chart data













Show chart data

MOODLE Analytics Tools

Analytics Models example:



Students at risk of not meeting the course completion conditions prediction

Name		Actions
 Jamaal Alonzo		Actions ▾
		<ul style="list-style-type: none"> Send message Outline report Acknowledged Not useful
Prediction details		
Time predicted	Monday, 8 April 2019, 9:01 AM	
Time range	Friday, 1 March 2019, 6:29 AM to Monday, 1 April 2019, 8:19 AM	
Indicator		Calculated value
Course accessed after end date		 No
Course accessed before start date		 No
Any write action		 No
Any write action in the course		 No
Read actions amount		 0%

Different plugins from MOODLE repository

Some plugins are developed for integrating with 3rd party systems such as Google Analytics, Intelliboard, etc.

The screenshot shows the Moodle plugins repository search results for the keyword 'analytics'. The search bar at the top contains the text 'analytics' and a magnifying glass icon. Below the search bar, there are filters for 'Plugin categories (any)' and 'Moodle version (any)'. A yellow box highlights the text '45 plugins' under the 'Clear filters' link. A yellow arrow points from the text '45 plugins for analytics' to this box. The search results are sorted by 'Relevance'. Three plugin cards are visible: 'Analytics graphs', 'Analytics for Moodle with Inte...', and 'Quiz Analytics'. Each card includes a brief description and a thumbnail image.

45 plugins for analytics

analytics 🔍 Plugin categories (any) Moodle version (any) Sort by 🔍 Relevance

[Clear filters](#)
45 plugins

Analytics graphs
Block that generates graphs intendend to facilitate pedagogical decisions. The graphs have zoom capabilities and allow fast communication with

Analytics for Moodle with Inte...
IntelliBoard is the #1 Learning Analytics Platform for Moodle. Meet an easy-to-use reporting and visualization platform that collects and analyzes data

Quiz Analytics
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MOODLE Analytics Tools



Quiz attempts + Profile info (school, class or group, etc.)

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

Surname **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

1 2 3 4 5 6 7 8 9 10 ... 93 »

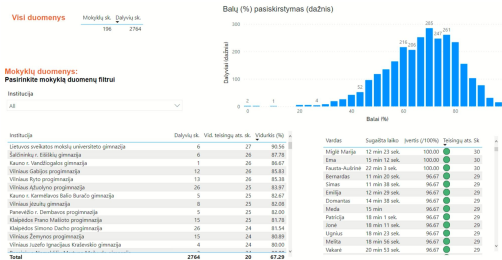
Download table data as

Comma separated values (.csv)

Download

Reset table preference:

<input type="checkbox"/>	First name / Surname	Email address	Department	Institution	State	Started on	Completed	Time taken	Grade/100.00	Q. 1 /3.33	Q. 2 /3.33	Q. 3 /3.33
<input type="checkbox"/>	MK		Team001	Alytaus Dainavos progimnazija	Finished	17 November 2022 7:55 AM	17 November 2022 8:24 AM	29 mins 9 secs	66.67	✓ 3.33	✓ 3.33	✗ 0.00
<input type="checkbox"/>	SM				Finished	17 November 2022 7:55 AM	17 November 2022 8:26 AM	31 mins 14 secs	93.33	✓ 3.33	✓ 3.33	✓ 3.33
<input type="checkbox"/>	US				Finished	17 November 2022 7:55 AM	17 November 2022 8:19 AM	24 mins 16 secs	63.33	✓ 3.33	✗ 0.00	✗ 0.00
<input type="checkbox"/>	LS		Team109	Prienų r. Balbieriškio pagrindinė mokykla	Finished	17 November 2022 7:55 AM	17 November 2022 8:10 AM	14 mins 48 secs	56.67	✓ 3.33	✗ 0.00	✓ 3.33



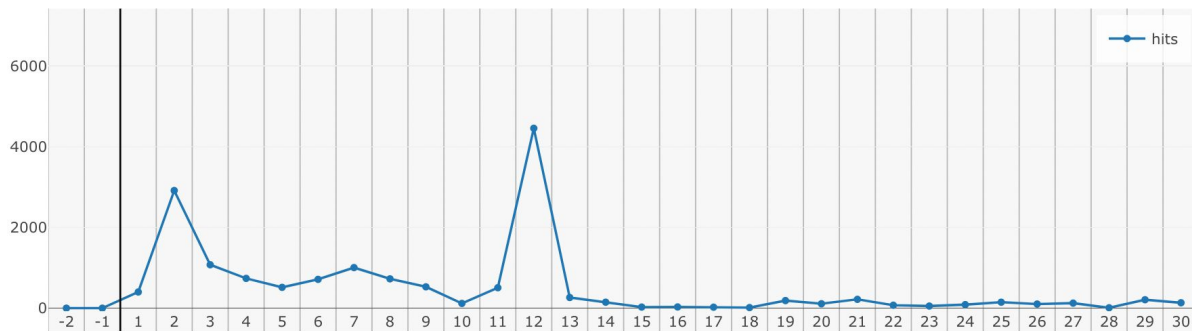
Open >>

Learning Analytics

(local_learning_analytics)

- For Teachers and Students
- Usage activities

Learning Analytics Dashboard



Participants

Total

1250

No change

Hits

Last 7 days

68

▼ -178

Quizzes & Assignments

Attempts and submissions (last 7 days)

0

No change

Most used activities

Last 7 days

Klausimai su ats...	5 hits
Užduočių sąlygo...	4 hits
Užduočių sąlygo...	4 hits

LA Plugins for Moodle



Learning Analytics (local learning analytics)

Quizzes and Assignments

This page shows statistics regarding quizzes and assignments in the course.

Quizzes

Quiz	Participants	Attempts	Overall average of all attempts	Overall average of first attempts
Bandomojo egzamino užduotis	265	272	27.4%	32.7%

Assignments

Assignment	Graded submissions	Overall average of all attempts
2014 m. IT VBE 1 programavimo užduoties sprendimų įkėlimas (nebūtina)	0	0.0%
Savarankiško darbo užduočių įkėlimas	0	0.0%
Savarankiško darbo užduočių įkėlimas	0	0.0%

Activities and Resources



The above figure shows the hits per activity. The order is based on the order of the activities in the course. The table below breaks down the hits by activity type. A click on the respective activity type limits the view to activities of the corresponding type. The table below shows the most frequently used activities in the course.

Activity type	Hits
<input checked="" type="checkbox"/> Quiz	15837
<input type="checkbox"/> Folder	14972
<input type="checkbox"/> URL	9507
<input type="checkbox"/> File	6653
<input type="checkbox"/> Forum	685
<input type="checkbox"/> Assignment	269

Most used activities

Activity	Activity type	Section	Hits
Bandomojo egzamino užduotis	Quiz	Bandomasis 2021 m. IT VBE	15837
Saugus ir teisėtas naudojimas informacija bei e-paslaugomis	File	Saugus ir teisėtas informacijos ir interneto naudojimas	1002
Pastikrininkė, treniruoklės. Testas su grįžtamuoju ryšiu	URL	Saugus ir teisėtas informacijos ir interneto naudojimas	999

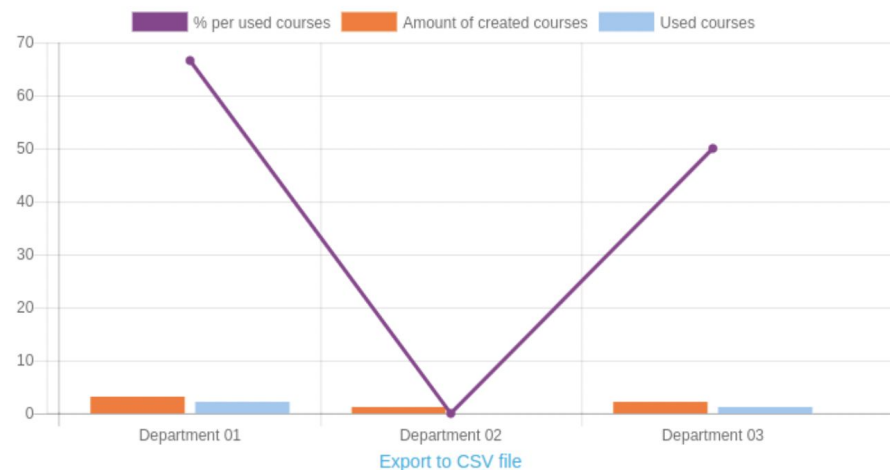
[Open >>](#)

LA Plugins for Moodle



Course Usage Statistics

(https://moodle.org/plugins/report_coursestats)



Category	Amount of created courses	Used courses	% per used courses
All categories	6	3	50.00%
Department 01	3	2	66.67%
Department 02	1	0	0.00%
Department 03	2	1	50.00%

Local / Custom Plugin

Progress report



- For teacher and administrator
- Time spent in course
- Average grade
- Students enrolled
- Attendance
(showing attendance session of the course,
showing enrolled and absent students)
- The notification to the parents and
administrator
- Notification about grade and attendance
 - Get grade
 - Absent students
 - Absent two time

1 Users **2** Courses

▼ **Progress report**

Select the parameters for your search

Start:

End:

Time between activity (minutes):

Sort by:

Filter by column:

Filter value:

Search

Local / Custom Plugin

Progress report



Example

Users

Courses

> Progress report

Search

Showing all enrolled students and their activity during the selected period.
Click on any user's name to see their detailed activity in courses.
Click on 'Profile' to see a user's Moodle profile.

Name	Time spent in course	Average grade	Absent sessions / Total sessions	Moodle profile
25 MantvisMK	10 mins 56 secs	50	1 / 2	
Abečiūnas Domas	24 mins 55 secs	66.67	1 / 2	
Abečiūnas Matas	24 mins 3 secs	70	1 / 2	
Abromovas Ernestas	17 mins 44 secs	66.67	1 / 2	
Abromaitė Ugnė	27 mins 23 secs	70	1 / 2	
Abromaitė Milda	22 mins 43 secs	46.67	1 / 2	
Abucevičiūtė Dominyka	50 mins 25 secs	70	1 / 2	
Acutė Audrita	26 mins 14 secs	73.33	1 / 2	



Users

Courses

> Progress report

Search

Showing all courses and their activity during the selected period.
Click on the name of the course to see a list of sessions
Click on the enroled user count to see a list of enroled users

Course name	Time spent in course	Students enrolled
Metodinė medžiaga	32 hours 36 mins 9 secs	0
Olimpiada - testas (2022 11 17 d.)	66 hours 24 mins 57 secs	2820
testinis kursas	-	1

Local / Custom Plugin

STATISTIC MODULE



Site administration

General

Users

Courses

Grades

Plugins

Notifications

Registration

Moodle services

Feedback settings

Advanced features

Migrate content from mo

Site admin presets

Download statistics

1



Statistics 2022-11-28 22_26_36.xlsx

2

- Local / Custom plugin for MOODLE - **statistics about different types of artefacts created and active participants in the courses**
- Developed and maintained by KTU EMTC
- Used:
 - **KTU**
 - Other universities and Colleagues
 - Schools and vocational schools
- Adapted for several business institutions (*KIKA, Ignitis*)

Local / Custom Plugin STATISTIC MODULE



Evaluate online courses

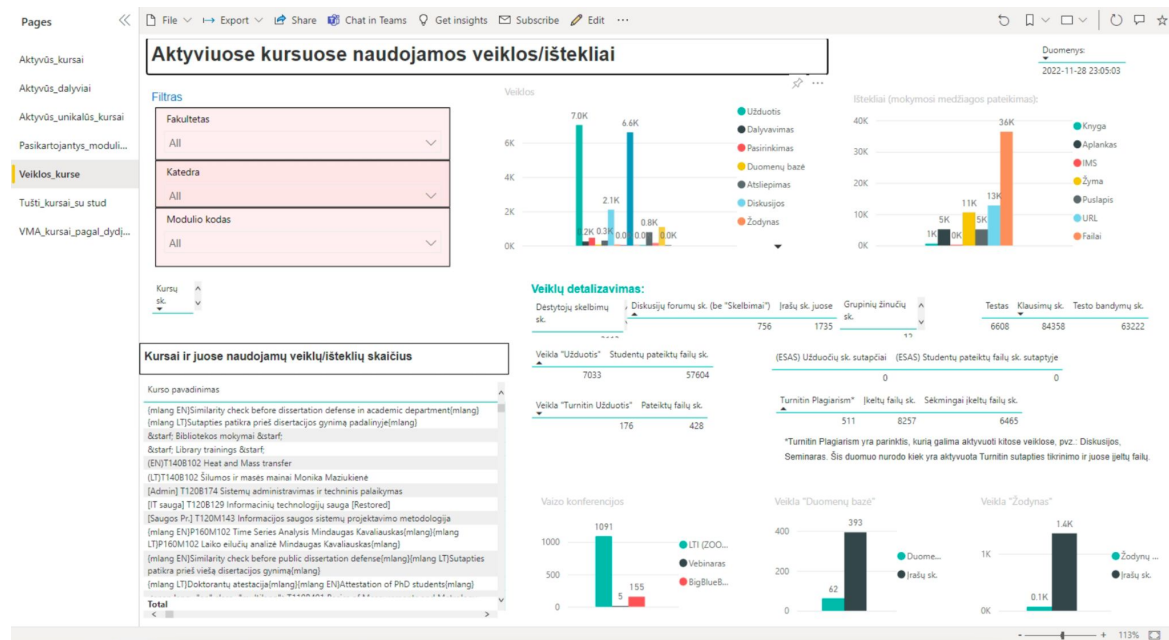
J33	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
	Course title	Course Id	Course ID number	Sub-category	Category	Course author	Registered teachers	Active teachers	Teacher last access	Registered students	Active students	Student last access	File	Page	URL
1	P000B001 Bakalauro baigiamasis projektas (Program	1691	P000B001	Programų inžinerijos katedra	INFORMATIKOS FAKULTETAS		29	10	2022-11-21 09:53:42	181	57	2022-11-28 09:27:18	21	4	11
2	T230M425 Statybinį gaminių ir konstrukcijų tyrimc	1692	T230M425	Statybos ir architektūros kompetencijų	STATYBOS IR ARCHITEKTŪROS FAKULTET		1	1	2022-11-28 15:45:36	23	17	2022-11-28 15:38:09	10	0	1
4	T230D438 Statybinį medžiagų ir konstrukcijų tyrim	1693	T230D438	Statybos ir architektūros kompetencijų	STATYBOS IR ARCHITEKTŪROS FAKULTET		1	0	2022-10-17 11:32:53	1	0	-	8	0	2
5	S000B106 Bakalauro baigiamasis projektas Irena Pek	1694	S000B106	Ekonomikos, verslo ir vadybos akademii	EKONOMIKOS IR VERSLO FAKULTETAS		15	0	2022-09-13 16:37:44	0	0	-	18	0	2
6	S000B111 Bakalauro baigiamasis projektas Irena Pek	1695	S000B111	Ekonomikos, verslo ir vadybos akademii	EKONOMIKOS IR VERSLO FAKULTETAS		23	0	2022-10-27 12:30:15	0	0	-	3	0	0
7	S190M191 Žmonių išteklų analitika Živilė Stankevič	1696	S190M191	Ekonomikos, verslo ir vadybos akademii	EKONOMIKOS IR VERSLO FAKULTETAS		2	1	2022-11-21 08:05:10	24	12	2022-11-28 11:07:39	87	0	12
8	S000B134 Bakalauro baigiamasis projektas (Marketin	1697	S000B134	Ekonomikos, verslo ir vadybos akademii	EKONOMIKOS IR VERSLO FAKULTETAS		22	1	2022-11-15 00:10:55	0	0	-	8	0	3
9	S000B150 Bakalauro baigiamasis projektas Aistė Dov	1698	S000B150	Ekonomikos, verslo ir vadybos akademii	EKONOMIKOS IR VERSLO FAKULTETAS		22	0	2022-09-08 12:36:18	0	0	-	22	0	4
10	T210M141 Adaptivioji mechanika: ryšiai, mechaniz	1699	T210M141	Technologijų ir verslumo kompetencijų	PANEVŽIO TECHNOLOGIJŲ IR VERSLO F.		1	0	2021-01-11 17:41:13	0	0	-	0	0	0
11	T210M145 Adaptivios mechatroninės sistemos Aurir	1700	T210M145	Technologijų ir verslumo kompetencijų	PANEVŽIO TECHNOLOGIJŲ IR VERSLO F.		1	0	2020-10-16 17:59:05	0	0	-	0	0	0
12	T280M109 Bepilotės antžeminio transporto sistemo	1701	T280M109	Technologijų ir verslumo kompetencijų	PANEVŽIO TECHNOLOGIJŲ IR VERSLO F.		1	0	2020-06-04 17:56:04	0	0	-	6	0	0
13	T280B004 Eismo saugumas Arūnas Tautkus	1702	T280B004	Technologijų ir verslumo kompetencijų	PANEVŽIO TECHNOLOGIJŲ IR VERSLO F.		1	0	2020-03-24 09:52:43	0	0	-	0	0	0
14	T190B106 Dinamika Aurimas Česnulevičius	1703	P190B106	Technologijų ir verslumo kompetencijų	PANEVŽIO TECHNOLOGIJŲ IR VERSLO F.		1	0	2018-11-09 10:11:36	0	0	-	0	0	0
15	T210B052 Automobiliai, jų eksploatacija ir remonas	1704	T210B052	Technologijų ir verslumo kompetencijų	PANEVŽIO TECHNOLOGIJŲ IR VERSLO F.		1	0	2019-04-17 08:44:19	0	0	-	0	0	0

	S	T	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AL	AM	AN	AO	AP	AR	AS	AT	AU	AV	AW	AX	AY
		Announcemen ts posted in Forum	Forum (not news) posts	Quiz	Questions	Student submitt ed files	Glossary	Entries in glossary	Wiki	Database	Databas e entrie	Choice	Lesson	Feedback	Workshop	Quiz attempts	HVP(h5p)	Groups Conversa tions	Date	Course language	Big Blue Button	KnockPlop	Zoom	LTI	Course Size MB	Turnitin	Turnitin files
1	2	4	1	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	2022-11-28 15:55:03	en	0	0	0	0	11224	0	0
2	2	0	0	2	9	7	0	0	0	0	0	0	0	0	0	0	0	0	2022-11-28 15:55:03	lt	0	0	0	0	833	0	0
3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2022-11-28 15:55:03	lt	0	0	0	0	166	0	0
4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2022-11-28 15:55:03	lt	0	0	0	1	42	0	0
5	1	0	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	2022-11-28 15:55:04	lt	0	0	0	0	758	0	0
6	1	4	0	1	10	46	0	0	0	0	0	0	0	0	1	0	0	0	2022-11-28 15:55:04	lt	0	0	0	0	1424	3	135
7	1	0	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	2022-11-28 15:55:04	lt	0	0	0	0	1310	0	0
8	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2022-11-28 15:55:04	lt	0	0	0	2	168	0	0
9	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2022-11-28 15:55:04	lt	0	0	0	0	0	0	0
10	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2022-11-28 15:55:04	lt	0	0	0	0	0	0	0
11	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2022-11-28 16:00:03	lt	0	0	0	0	0	0	0
12	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2022-11-28 16:00:03	lt	0	0	0	1	57	0	0
13	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2022-11-28 16:00:03	lt	0	0	0	0	0	0	0
14	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2022-11-28 16:00:03	lt	0	0	0	0	0	0	0
15	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2022-11-28 16:00:03	lt	0	0	0	0	0	0	0

Local / Custom Plugin STATISTIC MODULE



- Visualizations with PoverBI
- Connected to Moodle DataBase
- Custom visualizations - Dashboard
- Automatic update every night



Open >>

Local / Custom Plugin STATISTIC MODULE



- **Essay change and create own analysis**
- **Edit queries**

A screenshot of a web application window titled "Advanced Editor". The window has a light gray header bar with a small icon on the left and window control buttons (minimize, maximize, close) on the right. Below the header, the text "moodle_ktu_edu mdl_statistics" is displayed in a large, dark font. To the right of this text is a "Display Options" dropdown menu and a help icon. The main area of the window contains a SQL query written in a monospaced font. The query is enclosed in a light blue border and has a vertical line of code completion suggestions on the right side. The query starts with "let" and "in" keywords, followed by a series of table operations including "Source", "Filtered Rows", "Grouped Rows", "Filtered Rows1", "Changed Type", and "Renamed Columns".

```
let
Source = MySQL.Database("vma.ktu.lt:3366", "moodle_ktu_edu", [ReturnSingleDatabase=true]),
moodle_ktu_edu_mdl_statistics = Source[["Schema="moodle_ktu_edu",Item="mdl_statistics"]][Data],
#"Filtered Rows" = Table.SelectRows(moodle_ktu_edu_mdl_statistics, each ([students_count] <> 0) and ([category] <> "ATVIRIEJI MOKYMAI" an
#"Grouped Rows" = Table.Group(#"Filtered Rows", [{"courseid", "coursename", "idnumber", "subcategory", "category", "teachers", "teachers_c
#"Filtered Rows1" = Table.SelectRows(#"Grouped Rows", each ([subcategory] <> "Užsienio kalbų centras")),
#"Changed Type" = Table.TransformColumnTypes(#"Filtered Rows1",{{"Kursų sk.", Int64.Type}}),
#"Renamed Columns" = Table.RenameColumns(#"Changed Type",{{"course_size", "Kursų dydis (MB)"}})
in
#"Renamed Columns"
```

Main prerequisites for using LA

- Teachers' awareness of existing possibilities
- Completion tracking of MOODLE course activities