



Moodle Moot Greece 2017 – 1st & 2nd December

Conversion of Moodle to Exams System for Aircraft Engineers' Certification Exams of Hellenic Aerospace Industry in accordance with Technical Highway Directive 147-003 of Civil Aviation Authority

Exams for HAI for decades..



Source: <https://pixabay.com/en/empty-exam-hall-deserted-nobody-314554/>

HAI exams through an exams system for Directive 147-003



Source: <https://pixabay.com/en/computer-lab-education-technology-2381151/>

A typical exam process before the new “Exams System”

A local web application to:

- ✓ Create an “order” for a new exam (schedule)
- ✓ Add invigilator
- ✓ Add students
- ✓ Document Sign In Sheet - Attendance
- ✓ Update exam results

Diploma 6 stand-alone app (wimba) to:

- ✓ Manage 15.000+ questions
- ✓ Add metadata (custom fields) for each question
- ✓ Create exam sheet by selecting (manually) questions for each participant shuffling the questions
- ✓ Mark (manually) after exam all the used questions, in order to avoid use that question for 6 months in a new exam

Exams System roles

Local web app manager

Questions manager



Question Creator

Exams Manager

EASA Auditor

Invigilator

Examinee (student)

Was Moodle the solution?



Moodle has quiz Module



Moodle's Quiz Module shuffles the Questions



Moodle's Quiz module has good results for each quiz



Moodle has available a Question Bank tool to organize HAI's question library



Moodle can support different roles and we are able to create new roles

Big challenges to use Moodle...



- ✓ Transfer all Diploma questions with all metadata to Moodle
- ✓ Receive the “order’s” info for the new exam from the custom web app
- ✓ “Freeze” automatically a question after it is used in an exam for 6 months
- ✓ Return the results after the exam back to the custom web app
- ✓ Organize procedures in Moodle to cover almost everything “Diploma 6” was doing, because organization was familiar with that tool for over 10 years.
- ✓ Many-many “hidden” gems in exam process!

Diploma questions to Moodle (1/3)

15. The _____ if a supercharged engine is limited by:
 A) a temperature ramp pressure.
 B) valve sensitive to
 C) sensitive to centrifugally generated

Format: Multiple Choice

Properties	Information Fields	Feedback	Hints	Variables
Field Name	Field Value			
01-Module	15			
02-Subject				
03-Level	2			
04-Module Ref.	15			15.11
05-Objective				
06-MQ Number	15-0921			
07-Course Name	Module 15			
08-Book Reference	Rolls Royce "The Jet Engine" Page 103 Para 23.			
10-Author	Kou			
11-Author Title	A			
A&P Group A to B1				
A&P Group B to B1				
A&P Group C to B1				
A&P With Hel.				
A&P WTR to B1				
A1				
A2				
A3				
A4				
Applicability				
B1				
B1_1				
B1_2				
B1_3				
B1_4				
B2				
jav Group B to B2				
jav Group C to B2				
jav WTR or A to B2				
3H Group B to B2				
3H Group C to B2				
3H WTR or Group A to B2				
3O Group B to B2				
3O Group C to B2				
3O WTR or Group A to B2				
3S Group B to B2				
3S Group C to B2				
3S WTR or Group A to B2				
Issue Date	2014			
Owner	Kou			
Status	Rest2017_08			
Validation	Kou			
(New Field)				

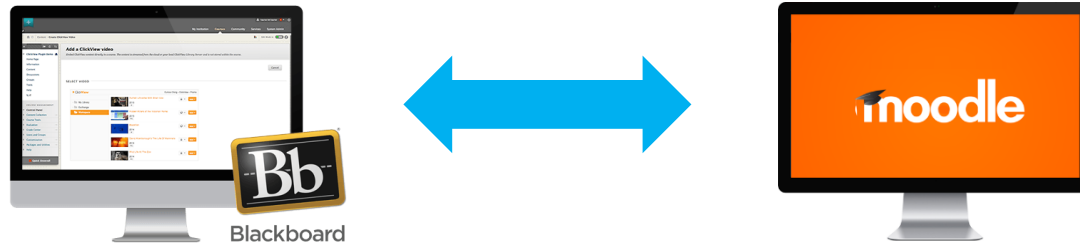
Things to consider

- ✓ 15.000+ questions
- ✓ 20+ metadata fields with important details for each question
- ✓ Questions had images too
- ✓ Multiple choice & essay question type only
- ✓ Optimize process after parsing (ex connect owner, validator, creator with real users in Moodle)
- ✓ 17 main exam modules
- ✓ Export-import process



Source: <https://pixabay.com/en/man-businessman-consider-face-head-404376/>

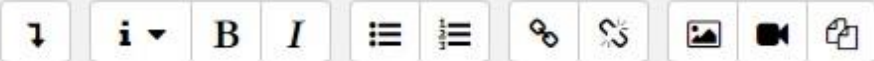
Diploma questions to Moodle (2/3)



Blackboard LS 6.3 export option from Diploma 6 was working with Moodle import Blackboard file format.

Success when import, but metadata where just text in feedback field!

Feedback



Jeppesen A & P Technician Textbook pg 1-29

01-Module: 11A, 11A & 11B, 11B
02-Subject: Theory of Flight
03-Level: 1
04-Module Ref.: 11A, 11A.1, 11A.1.1, 11B, 11B.1, 11B.1.1
05-Objective: To examine the knowledge of student on Theory of Flight & Theory of Flight
06-MCQ Number: 11A & 11B-0018

Hellenic Aerospace Industry Exams System

Dashboard > Site administration > Question management > Question Fields

Blocks editing on

Question Fields

Other fields *

Profile field	Edit
Revision No	⚙️ ✕ ↓
Validation	⚙️ ✕ ↑ ↓
Author	⚙️ ✕ ↑ ↓
Revision Date	⚙️ ✕ ↑ ↓
Reason for revision	⚙️ ✕ ↑ ↓
Revised by	⚙️ ✕ ↑ ↓
Create a new Question field	⚙️ ✕ ↑ ↓
Date/Time	
Dropdown menu	⚙️ ✕ ↑ ↓
List of objects (multiple select)	⚙️ ✕ ↑ ↓
Multi Select	
Text area	⚙️ ✕ ↑
Text input	
Text input (numeric)	

Create a new Question field OR Create a new profile category

The solution

- ✓ A new plugin for question's metadata, common to custom profile fields
- ✓ New “entity” in each question to add metadata
- ✓ Change the core “import from Blackboard” mechanism to parse metadata from feedback field to new Moodle question metadata fields.
- ✓ Create clever automations to connect users (ex creators validators), transform text variables to date (ex rest_2017), etc

Multiple tries

Created / last saved

Question Fields

Save changes and continue editing Preview

Save changes Cancel

Questions Management in Moodle (1/2)

Question Bank

Dashboard ► Exams ► X0041 ► Question bank ► Questions

Question bank

Select a category:

Default for X0041 (2) ▼

The default category for questions shared in context 'X0041'.

Show question text in the question list
[Search options](#) ▼

Also show questions from subcategories
 Also show old questions

Both used & unused ▼

Dashboard ► Site administration ► Question management ► Question Settings

Select custom question fields

Please select the question fields that you want to be displayed in filter for page(Question bank).

Select fields

Active
Next availability
EASA - Non EASA
Question status
01-Module

Submit Cancel

▼ Filter question form

Active

Yes ▼

01-Module

Select a value
1
2
3

03-Level

3 ▼

04-Module Ref.

1
1.11.2.1
1.2.1
1.2.2

Submit Cancel

Create a new question ...

Create a new question...

Choose a question type to add

QUESTIONS

Multiple choice
A simple form of multiple choice question with just the two choices 'True' and 'False'.

True/False

Matching

Essay

OTHER

Add Cancel

Questions Management in Moodle (2/2)

Question Management Course

Dashboard ▶ Exams ▶ Question Management Course

NAVIGATION

Dashboard

▶ Site pages

▼ Exams

▼ Question Management Course

▶ Participants

Grades

▶ General

▶ MODULE 1

▶ MODULE 2

▶ MODULE 3

▶ MODULE 4

▶ MODULE 5

▶ MODULE 6

▶ MODULE 7

▶ MODULE 8

Announcements

MODULE 1

Questions 1.1

Questions 1.2

MODULE 2

Questions 2.1

Questions 2.2

A Moodle Course with:

- ✓ Student quiz module community plugin
- ✓ 17 topics with X number of Studentquiz activities
- ✓ New role “Question Creator”
- ✓ New role “Question Editor”
- ✓ Locally assign users to the activity they are experts

Create new question

Filter

With selected: Start Quiz

<input type="checkbox"/>	T	Question	Created by	Approved	Tags	Ratings	Difficulty	Attempts	Comments
<input checked="" type="checkbox"/>		StudentQuiz Point System	anonym anonym 16 June 2017, 2:38 PM	✓	studentquiz, point system	no ratings	no difficulty	no attempts	no comment
<input checked="" type="checkbox"/>		HSR Location	anonym anonym 16 June 2017, 2:38 PM	✓	studentquiz	1.00	0.00	1	1
<input checked="" type="checkbox"/>		StudentQuiz License	anonym anonym 16 June 2017, 2:35 PM	✓	studentquiz	no ratings	no difficulty	no attempts	no comment
<input checked="" type="checkbox"/>		StudentQuiz Features	anonym anonym 16 June 2017, 2:38 PM	✓	studentquiz, features	4.00	1.00	1	no comment
<input checked="" type="checkbox"/>		StudentQuiz Filter	anonym anonym 16 June 2017, 2:35 PM	✓	studentquiz, filter	no ratings	no difficulty	no attempts	no comment
<input checked="" type="checkbox"/>		StudentQuiz Point System	anonym anonym 16 June 2017, 2:38 PM	✓	studentquiz, point system	no ratings	no difficulty	no attempts	no comment
<input checked="" type="checkbox"/>		StudentQuiz Collaboration	anonym anonym 16 June 2017, 2:25 PM	✓	studentquiz, collaboration	no ratings	no difficulty	no attempts	no comment
<input checked="" type="checkbox"/>		StudentQuiz Origin	Demo Student01 16 June 2017, 2:35 PM	X	studentquiz, origin	5.00	1.00	1	no comment
<input checked="" type="checkbox"/>		StudentQuiz Reusability	anonym anonym 16 June 2017, 2:38 PM	✓	studentquiz, reusability	no ratings	no difficulty	no attempts	no comment

With selected: Start Quiz

Local web app integration with Moodle (1/3)

Create new exams

Dashboard ▶ Site administration ▶ Exam management ▶ Create new exam

Exam id	Course code	Description	Starting date	Ending date	Pass grade (%)	Action	Action	Action
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>				
10738	X0062	MODULE 6. MATERIALS AND HARDWARE for B1 Category	1970/01/1 02:00	1970/01/1 02:00	75	Create	Create	Created



By selecting the “Create” button

Actions	Order Id	Order Type	Group	Course Code	Course Description	Start Date	Completion Date	Order Weeks	AEP/ATP	Status	EFF SEND
	abc	abc	abc	abc	abc	=	=	abc	abc	abc	abc
	10738	EXC	/ :	X0062	MODULE 6. MATERIALS AND HARDWARE for B1 Category	09/08/2017	09/08/2017	NULL	2 34	OPEN	NULL

TEACHERS

Shown first 1 of 1 records (full view)

Instructor Id	Surname	Name	AEP	Time From	Time To	Weekly Hours	HardCopy	CO_TEACHING
C 43	2 34	09:00:00	10:30:00		NULL	

Weeks Course Aggregated Data Tests Comments Course Critique Eff Evaluation Requests Instructors

Shown first 5 of 5 records (full view)

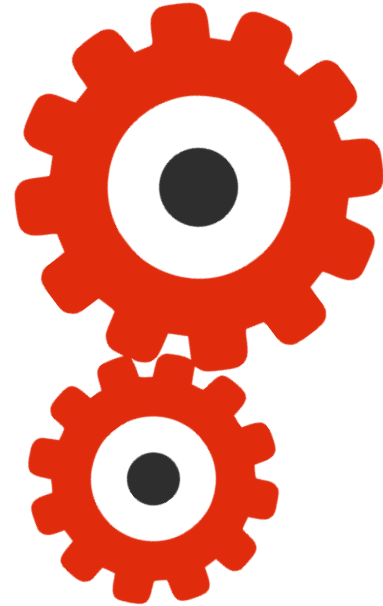
Student Id	Surname	Name	Total Attendance Hours	Total Absence Hours	Mark	Result	Certification	HardCopy	
M3 2	NULL	1.5	0.0	75.0	S	NULL	NULL
M3 3	NULL	1.5	0.0	90.3	S	NULL	NULL
M3 4	NULL	1.5	0.0	75.0	S	NULL	NULL
M2 6	NULL	1.5	0.0	63.9	U	NULL	NULL
M3 7	NULL	1.5	0.0	69.4	U	NULL	NULL



we had some magic...

Create action creates:

- A new Moodle category (if it wasn't exist)
- A new Moodle Course (if it wasn't exist)
- A new Quiz Activity on top of topic one
- Users created in Moodle (if they haven't participated in other exam previously)
- Users enrolled in Moodle course with "no role"
- Users locally enrolled in that activity as "Examinees" or Invigilators
- A new group with examinees & invigilators (for better filters in reports)
- Quiz settings were setup with specific options such as:
 - ✓ Time open, close, timing
 - ✓ Grade to pass, attempts allowed
 - ✓ Layout with 10 questions per page
 - ✓ Question behavior shuffle
 - ✓ Review options only marks & overall feedback (with default messages)
 - ✓ Restriction options with date and group



Local web app integration with Moodle (3/3)

Manage exams

[Dashboard](#) > [Site administration](#) > [Exam management](#) > [Manage exams](#)

Exam id	Course code	Description	Created by	Updated by	Timestart	Timefinish	Passgrade	Action	Create passwords
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>		
10738	X0062	MODULE 6. MATERIALS AND HARDWARE for B1 Category	Admin Super at 26/11/2017 17:52	-	1/01/1970 02:00	1/01/1970 03:30	75.00	 	 

Exams Manager:

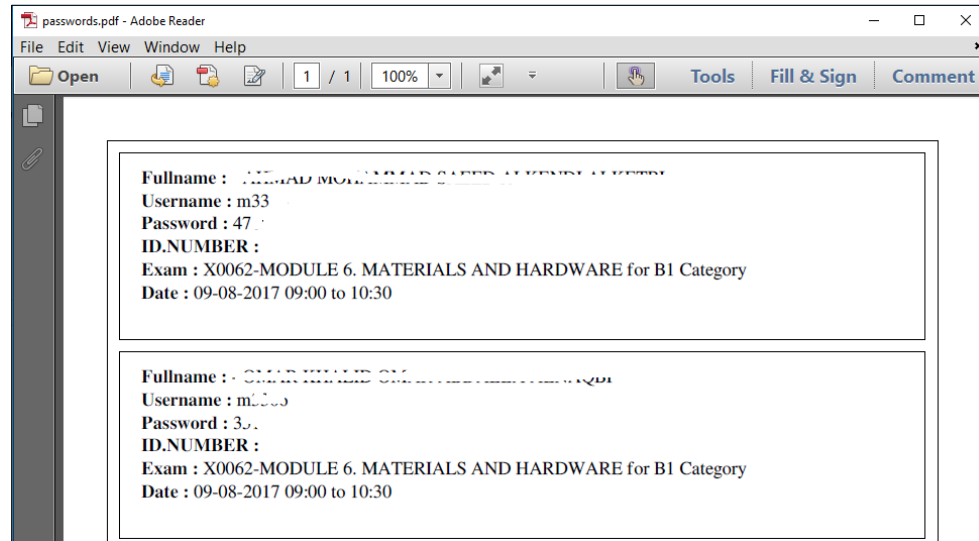
- ✓ Sync details until exam starts
- ✓ Delete exam if canceled
- ✓ Create pdf with username/password for examinees & invigilators

Generate passwords for students for exam 10738

Are you sure you want to generate passwords?





Cancel

Proceed



passwords.pdf - Adobe Reader

File Edit View Window Help

Open    1 / 1 100%  Tools Fill & Sign Comment

Fullname : **ALHAD MOHAMMAD SAIED ALKENSY ALKENSY**
Username : m33
Password : 47
ID.NUMBER :
Exam : X0062-MODULE 6. MATERIALS AND HARDWARE for B1 Category
Date : 09-08-2017 09:00 to 10:30

Fullname : **SMAR KHILID SMAR KHILID SMAR KHILID SMAR KHILID**
Username : m33
Password : 35
ID.NUMBER :
Exam : X0062-MODULE 6. MATERIALS AND HARDWARE for B1 Category
Date : 09-08-2017 09:00 to 10:30

Exams preparation

Exams Manager adds questions to quiz

10738 (Sunday, 26 November 2017, 2:00 AM)

Restricted Not available unless:

- It is on or after **26 November 2017** (hidden otherwise)
- It is before **26 November 2017, 11:00 PM** (hidden otherwise)
- You belong to **10738** (hidden otherwise)

Shuffle ?

Add ▾

+ a new question

+ from question bank

+ a random question

Notification

- The following question **A 10 ohm resistor has a 14.14 V peak drop across it. What power is dissipated?** cannot be inserted because is deactivated

Notification

- The following question **A positive ion** cannot be inserted because already has been inserted in the following quizz [Quizz link](#)

Questions: 0

Select a category:

Default for X0062 ▾

The default category for questions shared in context 'X0062'.

Filter question form

Active Yes ▾

01-Module **Select a value** ▾
1
2
3

03-Level 3 ▾

04-Module Ref. **1** ▾
1.11.2.1
1.2.1
1.3.3

Submit

Cancel

Examinee – Invigilator Views (1/3)

WELCOME TO HELLENIC AEROSPACE INDUSTRY TRAINING ACADEMY!



Effectiveness.

The Hellenic Aerospace Industry has always recognized the importance of training and development of its employees for the achievement of its mission and the execution of its business by maintaining its corporate values for Accountability, Team spirit, Respect and

WELCOME TO HELLENIC AEROSPACE INDUSTRY TRAINING ACADEMY!



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EXAM OVERVIEW

List of exams as student at 26/11/2017

- 10738 (Sunday, 26 November 2017, 2:00 AM)
Starting: 26/11/2017 , 00:00
Finishing: 26/11/2017 , 01:30

EXAM OVERVIEW

List of exams as invigilator at 26/11/2017

- 10738 (Sunday, 26 November 2017, 2:00 AM)
Starting: 26/11/2017 , 00:00
Finishing: 26/11/2017 , 01:30



Examinee – Invigilator Views (2/3)

X0062-MODULE 6. MATERIALS AND HARDWARE for B1 Category

[Dashboard](#) ▶ [My exams](#) ▶ [X0062](#) ▶ [Topic 1](#) ▶ [10738 \(Sunday, 26 November 2017, 2:00 AM\)](#)

10738 (Sunday, 26 November 2017, 2:00 AM)

MODULE 6. MATERIALS AND HARDWARE for B1 Category

Attempts allowed: 1

This quiz opened at Sunday, 26 November 2017, 12:00 AM

Time limit: 1 hour 30 mins

[Attempt quiz now](#)

X0062-MODULE 6. MATERIALS AND HARDWARE for B1 Category

[Dashboard](#) ▶ [My exams](#) ▶ [X0062](#) ▶ [Topic 1](#) ▶ [10738 \(Sunday, 26 November 2017, 2:00 AM\)](#)

10738 (Sunday, 26 November 2017, 2:00 AM)

MODULE 6. MATERIALS AND HARDWARE for B1 Category

Attempts allowed: 1

This quiz opened at Sunday, 26 November 2017, 12:00 AM

Time limit: 1 hour 30 mins

[Start now](#)

Examinee – Invigilator Views (3/3)

X0062-MODULE 6. MATERIALS AND HARDWARE for B1 Category

[Dashboard](#) ▶ [My exams](#) ▶ [X0062](#) ▶ [Topic 1](#) ▶ [10738 \(Sunday, 26 November 2017, 2:00 AM\)](#)

10738 (Sunday, 26 November 2017, 2:00 AM)

MODULE 6. MATERIALS AND HARDWARE for B1 Category

Attempts allowed: 1

This quiz opened at Sunday, 26 November 2017, 12:00 AM

Time limit: 1 hour 30 mins

Quiz started at Sunday, 26 November 2017, 7:15 PM

[Attempt quiz now](#)

X0062-MODULE 6. MATERIALS AND HARDWARE for B1 Category

[Dashboard](#) ▶ [My exams](#) ▶ [X0062](#) ▶ [Topic 1](#) ▶ [10738 \(Sunday, 26 November 2017, 2:00 AM\)](#)

10738 (Sunday, 26 November 2017, 2:00 AM)

MODULE 6. MATERIALS AND HARDWARE for B1 Category

Attempts allowed: 1

This quiz opened at Sunday, 26 November 2017, 12:00 AM

Time limit: 1 hour 30 mins

[Start now](#)

Quiz started at Sunday, 26 November 2017, 7:15 PM

01:29:50

All students start simultaneous the quiz. If an examinee delay to select “Attempt quiz now”, then the examinee misses that time from the time limit.

Moodle integration with local web app

Exams Manager

- ✓ Post exams result back to HAI's local web app
- ✓ Has overview of pass/fail
- ✓ Marks if an examinee "cheated" at exam

Post exams

[Dashboard](#) ▶ [Site administration](#) ▶ [Exam management](#) ▶ [View finished exams](#)

Order Id	Name	Exam Time started	Exam Time finished	Status	Synced by	Synced date	Action	T
10723	10723(Thursday, 15 January 1970, 2:00 AM)	Wednesday, 15 November 2017, 2:20 PM	Wednesday, 15 November 2017, 2:21 PM	NOT SYNCED	Pending		View	2017-11-26 18:11:00
								Delete

Name	10723(Thursday, 15 January 1970, 2:00 AM)						
Started on	Wednesday, 15 November 2017, 2:20 PM						
Completed on	Wednesday, 15 November 2017, 2:21 PM						
Timelimit	0 016666666666667 minutes						
Pass grade	75.00						
Participants	12						
Invigilators	05: GEORGIOS TSOLOMITIS, 04: EFSTRATIOS...						
Students for Order Id 10723							
AM UNISYS	First Name	Last Name	Grade	Status	Suspended	Attempt Link	
m32					<input type="checkbox"/>		
m33					<input type="checkbox"/>		
m33					<input type="checkbox"/>		
m32					<input type="checkbox"/>		
m32			0.00 / 100	FAIL	<input type="checkbox"/>	Attempt	
m32					<input type="checkbox"/>		
m33					<input type="checkbox"/>		
m33					<input type="checkbox"/>		
m33					<input type="checkbox"/>		
m33					<input type="checkbox"/>		
m33					<input type="checkbox"/>		
Υποβολή ερωτημάτων							

Quiz review attempt

- ✓ Order details at quiz review page
- ✓ Important question metadata available at each quiz (for auditors & admins only)

The screenshot shows the Moodle quiz review interface. The top navigation bar includes the logo of ΕΛΛΗΝΙΚΗ ΑΕΡΟΠΟΡΙΚΗ ΒΙΟΜΗΧΑΝΙΑ Α.Ε. and the user name Super Admin. The breadcrumb trail is Dashboard > Exams > X0062 > Topic 1 > 10738 (Sunday, 26 November 2017, 2:00 AM).

NAVIGATION

- Dashboard
 - Site pages
 - Exams

QUIZ NAVIGATION

1 2

Finish review

AM

ADMINISTRATION

- Quiz administration
 - Edit settings
 - Group overrides
 - User overrides
- Edit quiz
- Preview
- Results
 - Locally assigned roles
 - Permissions

Quiz Details

Started on	Sunday, 26 November 2017, 7:15 PM
State	Finished
Completed on	Sunday, 26 November 2017, 7:16 PM
Time taken	1 min 7 secs
Marks	0.00/2.00
Grade	0.00 out of 100.00

Order details

Name	10738 (Sunday, 26 November 2017, 2:00 AM)
Started on	19-09-2019 09:00:00
Completed on	19-09-2019 09:50:00
Timelimit	50 mins
Participants	0
Invigilators	05566 06230303 0007000350450 0304050 0400000304

Question 1 Incorrect **Module Ref: 2.2 Level:3** Mark 0.00 out of 1.00 Edit question

A germanium diode is used for

Select one:

- a. Forward-biased **✗ Germanium diode has the least forward bias voltage drop and is best for rectification. Aircraft Electricity and Electronics 5th Edition Eismin Page 110**
- b. Modulation
- c. Rectification

Exam Statistics – General Question statistics

Statistics and drill-down reporting per question for all times has been used in all courses, in all quiz exams!

Question statistics

Dashboard > Site administration > Reports > Question statistics > Question statistics

Blocks editing on

General question filters

01-Module
Select a value
1
2
3

03-Level
Select a value

Advanced question filters

Display questions with attempts only

Select exam category
Select all

Select exams
Select all

Select quizzes
Select all

Submit Cancel

Download table data as Comma separated values (.csv) Download

id	Question Name	Type	Success %	Answered correctly	No of exams	Question results
28523	new	truefalse	0.00%	0/1	1	Questions 3.2
11082	question1	multichoice	0.00%	0/1	3	Questions 1.1 Questions 1.1 Questions 1.1
11531	question 2	multichoice	0.00%	0/1	2	Questions 1.1 Questions 1.1
28527	question 1	truefalse	0.00%	0/2	1	Questions 1.1
9818	A semiconductor which emits photons and releases electrons when stimulated by...	multichoice	0.00%	0/1	1	10738 (Sunday, 26 November 2017, 2:00 AM)
9821	A germanium diode is used for	multichoice	0.00%	0/1	1	10738 (Sunday, 26 November 2017, 2:00 AM)
27410	$(x + y + z)(x + y + z) =$	multichoice	0.00%	0/1	1	10723(Thursday, 1 January 1970, 2:00 AM)

Other modifications

- ✓ Works with safe exam browser
- ✓ Quick dashboard menu
- ✓ Detailed logs for each plugin
- ✓ New roles with minimized capabilities
- ✓ None edit profile option
- ✓ “Freeze” questions for 6 months after they used in an exam, but offer option to manually unfreeze earlier!
- ✓ Attempt quiz page timer



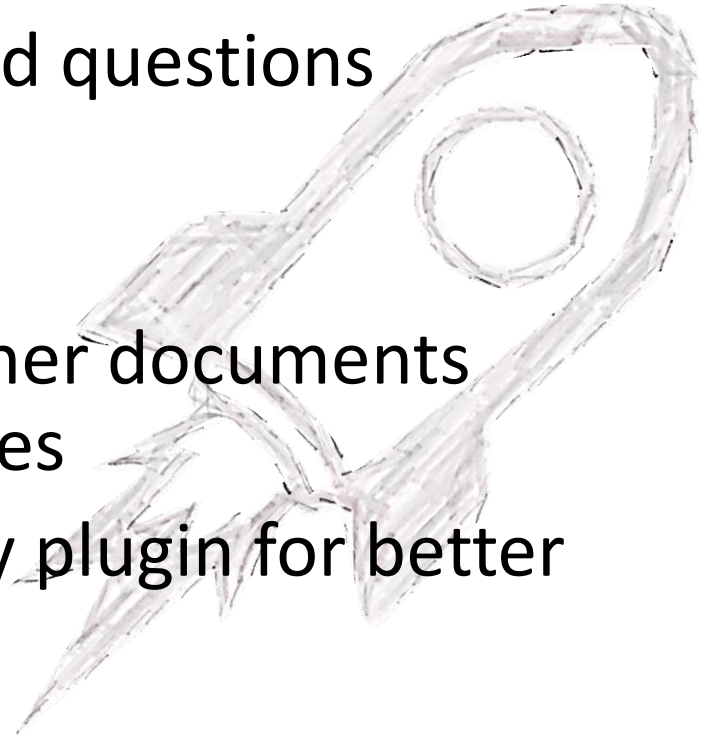
HAI exams through an exams system for Directive 147-003



Source: http://www.tphumancapital.com.au/roomhire/wp-content/uploads/2015/06/IMG_5350.jpg

Future steps

- Create rules for each exam to add questions automatically with creation
- Bulk question metadata edit
- Pdf report after exam ends & other documents based to organizations procedures
- Install **Quiz Analytics** community plugin for better reporting on quiz questions



Special thanks to...

- Mr Lamprou Spiros
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- Mr Papazafeiropoulos Ioannis
- Mr Christou Diamandis
- Mr Alogakos Petros

THANKS



Thank you for your attention



We design the appropriate e-Learning Experience that suits to your organization!

Address

46-48 El. Venizelou Avenue, Kallithea, 17676, Athens, Greece

Contact

Tel: +30 210 4223330

FAX: +30 211 0121603

Email: info@wideservices.gr

www.wideservices.gr

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