

## CHAPTER 5

### IMPLEMENTATION AND TESTING

#### 5.1 Implementation

In this chapter discusses the implementation with stages starting from the installation of the Ubuntu operating system, installing software support to the installation of Concerto Platform.

Step of the Linux Ubuntu Installation:

1. The initial stage in the ubuntu installation process is choosing a language. Then choose the type of software installation support. After that choose the hard drive partition that will install ubuntu operating system

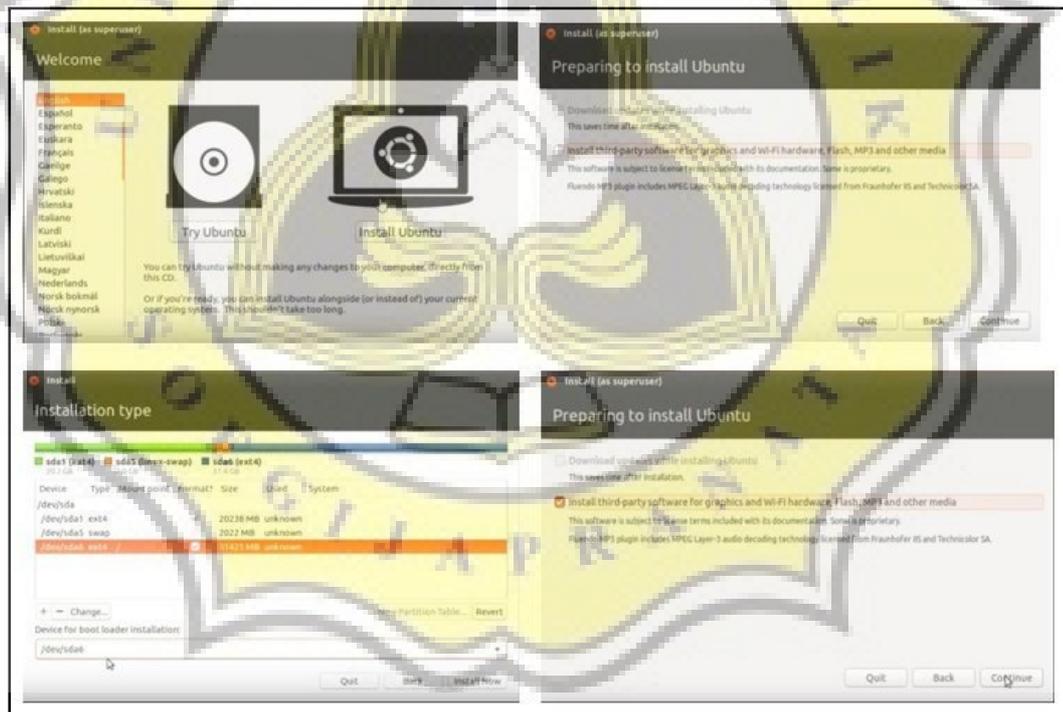


Illustration 5.1: Install Ubuntu Step 1-4

2. The next stage is to choose the time zone, keyboard layout. Then the name of the owner of the computer along with data such as username and password that will be used to login and enter root access on the terminal.



Illustration 5.2: Install Ubuntu Step 5-8

Step of the concerto platform Installation:

1. Open Terminal
2. Install apache using command **“sudo apt-get install apache2”**.  
after the ubuntu operating system installed then the next step is to install apache to run the PHP server.
3. Install mysql server using command **“sudo apt-get install mysql-server”**  
after successfully install apache next stage is to install mysql server as service database.
4. Install git using command **“sudo apt-get install git”**  
the next thing is to install git to download the concerto platform from the repository.
5. Install R using command **“sudo apt-get install r-base”**  
after apache, mysql and git installed the next stage is to install R.

6. Enter R using command “**sudo -i R**”.

After R successfully installed, access R application to install the required packages.

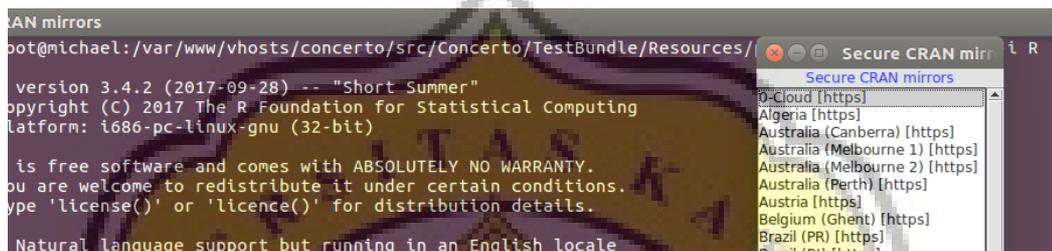


Illustration 5.3: Install package R

At the time of installing package R initial stage is to choose location of server mirror provided by R. Chose by enter number example “0” then enter.

7. Install using command “**sudo apt-get install libmysqlclient-dev**”.

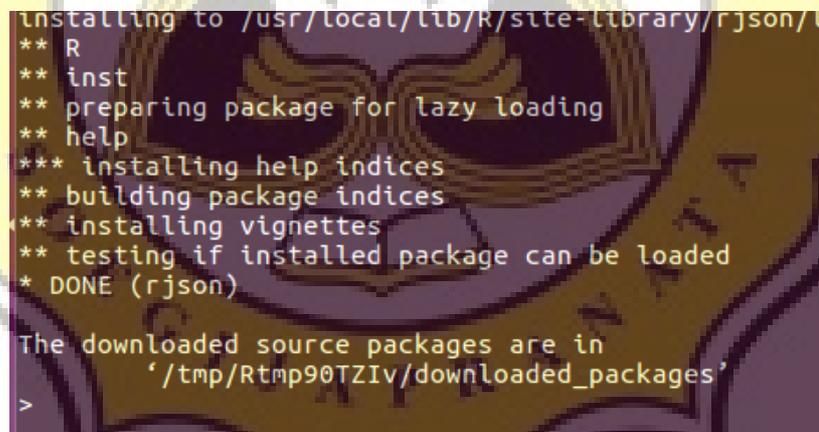


Illustration 5.4: Install packages R

8. The next step is the installation of the R packages needed to run the platform concerto. Packages needed such as jsonlite, rjson, session, rmysql, catR, ggplot2 and base64enc. To install packages enter command “**install.package(‘rsjon’)**”



```
git clone https://github.com/campsych/concerto-platform.git /var/www/vhosts/concerto

ichael:/home/michael
root@michael:/home/michael# git clone https://github.com/campsych/concerto-platform.git /var/www/vhosts/
Cloning into '/var/www/vhosts/concerto'...
remote: Counting objects: 9746, done.
remote: Compressing objects: 100% (14/14), done.
remote: Total 9746 (delta 2), reused 10 (delta 2), pack-reused 9730
Receiving objects: 100% (9746/9746), 3.58 MiB | 653.00 KiB/s, done.
Resolving deltas: 100% (7122/7122), done.
Checking connectivity... done.
root@michael:/home/michael#
```

Illustration 5.5: Clone Concerto Platform

9. After all the preparations or supporting applications are installed then clone the source code concerto platform with git in the **var / www / vhosts / concerto /** in the file **/etc/apache2/sites-available/000-default.conf**

```
<VirtualHost *:80>
    ServerAdmin webmaster@localhost
    DocumentRoot /var/www/vhosts/concerto/web
</VirtualHost>
```

after edit virtual host edit file document root /etc/apache2/apache2.conf

```
<Directory /var/www/vhosts/concerto/web>
    AllowOverride All
</Directory>
```

after the file contained in the folder the next stage is the configuration of vhost and directory.

```

root@michael:/etc/apache2/sites-available# mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 5
Server version: 5.7.19-0ubuntu0.16.04.1 (Ubuntu)

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affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql>

```

Illustration 5.6: Configuration MySQL

```

mysql> CREATE DATABASE concerto CHARACTER SET utf8 COLLATE utf8_general_ci;
Query OK, 1 row affected (0,00 sec)

mysql> show databases
-> exit
-> q
->
-> q;
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual t
o use near 'exit
q
q' at line 2
mysql> show databases;
+-----+
| Database |
+-----+
| information_schema |
| concerto |
| mysql |
| performance_schema |
| sys |
+-----+
5 rows in set (0,01 sec)

mysql>

```

Illustration 5.7: Create database

10. The next step is to enter into the database, then create a database with the name of concerto. Enter mysql command “**CREATE DATABASE concerto CHARACTER SET utf8 COLLATE utf8\_general\_ci;**”.

```

root@michael:/etc/apache2/sites-available# cp /var/www/vhosts/concerto/app/config/parameters.yml.dist /va
eters.yml
root@michael:/etc/apache2/sites-available# cp /var/www/vhosts/concerto/app/config/parameters_nodes.yml.di
/parameters_nodes.yml
root@michael:/etc/apache2/sites-available# cp /var/www/vhosts/concerto/app/config/parameters_test_runner.
config/parameters_test_runner.yml
root@michael:/etc/apache2/sites-available# cp /var/www/vhosts/concerto/app/config/parameters_uio.yml.dist
arameters_uio.yml
root@michael:/etc/apache2/sites-available# █

```

Illustration 5.8: Copy Config file Database

```

GNU nano 2.5.3 File: /var/www/vhosts/concerto/app/config/parameters
parameters:
  database_driver: pdo_mysql
  database_host: localhost
  database_port: null
  database_name: concerto
  database_user: root
  database_password: abcdef
  database_path: null
  database_unix_socket: null
  test_database_name: ThisIsYourTestDatabaseName #not needed for production env
  test_database_user: ThisIsYourTestDatabaseUserName #not needed for production env
  test_database_password: ThisIsYourTestDatabaseUserPassword #not needed for production
  mailer_transport: smtp
  mailer_host: localhost
  mailer_user: null
  mailer_password: null
  locale: en_GB
  secret: ThisTokenIsNotSoSecretChangeIt

```

Illustration 5.9: Edit Config file Database

11. Then copy the configuration of the concerto database platform and edit according to the configuration used (database name, password, host). Then create a database named concerto.

```

michael:/var/www/vhosts/concerto
root@michael:/var/www/vhosts/concerto# curl -s http://getcomposer.org/installer | php
All settings correct for Using Composer
Downloading...

Composer (version 1.5.2) successfully installed to: /var/www/vhosts/concerto/composer.phar
Use it: php composer.phar

root@michael:/var/www/vhosts/concerto# █

root@michael:/var/www/vhosts/concerto# php -dmemory_limit=1G composer.phar install --no-interaction
Do not run Composer as root/super user! See https://getcomposer.org/root for details
Loading composer repositories with package information
Installing dependencies (including require-dev) from lock file
Package operations: 41 installs, 0 updates, 0 removals
- Installing ocramius/stajiga (v1.4.1): Downloading (100%)
- Installing doctrine/lexer (v1.0.1): Downloading (100%)
- Installing doctrine/annotations (v1.2.7): Downloading (100%)
- Installing twig/twig (v1.24.0): Downloading (100%)
- Installing symfony/polyfill-mbstring (v1.1.1): Downloading (100%)
- Installing symfony/polyfill-apcu (v1.1.1): Downloading (100%)
- Installing psr/log (1.0.0): Downloading (100%)
- Installing paragonie/random-compat (v1.4.1): Downloading (100%)
- Installing doctrine/inflector (v1.1.0): Downloading (100%)
- Installing doctrine/collections (v1.3.0): Downloading (100%)
- Installing doctrine/cache (v1.5.4): Downloading (100%)
- Installing doctrine/common (v2.5.3): Downloading (100%)
- Installing symfony/symfony (v2.7.11): Downloading (100%)
- Installing jdoorn/sql-formatter (v1.2.17): Downloading (100%)
- Installing doctrine/doctrine-cache-bundle (1.3.0): Downloading (100%)
- Installing doctrine/dbal (v2.5.4): Downloading (100%)
- Installing doctrine/doctrine-bundle (1.6.2): Downloading (100%)
- Installing doctrine/instantiator (1.0.5): Downloading (100%)
- Installing doctrine/orm (v2.5.4): Downloading (100%)
- Installing friendssofSymfony/oauth2-php (1.2.0): Downloading (100%)
- Installing friendssofSymfony/oauth-server-bundle (dev-master 59229c2): Cloning 59229c28c0 from cache
- Installing incenkeev/composer-parameter-handler (v2.1.2): Downloading (100%)
- Installing jms/metadata (1.5.1): Downloading (100%)
- Installing phpoption/phpoption (1.5.0): Downloading (100%)
- Installing ... (1.0.0): Downloading (100%)

```

Illustration 5.10: Install PHP Dependencies

11. The next step is to go to concerto folder then install php dependency with composer. Initial step is download composer using command “curl -s <http://getcomposer.org/installer> | php”. Then install php dependencies use command “php -dmemory\_limit=1G composer.phar install --no-interaction”. Then composer will automatically install all the concerto dependencies.

```
michael: /var/www/vhosts/concerto
root@michael:/var/www/vhosts/concerto# sudo apt-get install npm
Reading package lists... Done
Building dependency tree
Reading state information... Done
npm is already the newest version (3.5.2-0ubuntu4).
0 upgraded, 0 newly installed, 0 to remove and 571 not upgraded.
root@michael:/var/www/vhosts/concerto#
```

Illustration 5.11: Install NPM

12. The next step is to install NPM to download javascript dependencies. Install NPM using command “sudo apt-get install npm”.

```
root@michael:/var/www/vhosts/concerto# sudo npm install -g bower
npm WARN deprecated bower@1.8.2: ...psst! Your project can stop working at
ating to Yarn: https://bower.io/blog/2017/how-to-migrate-away-from-bower/
/usr/local/bin/bower -> /usr/local/lib/node_modules/bower/bin/bower
/usr/local/lib
└─ bower@1.3.2
root@michael:/var/www/vhosts/concerto#
```

Illustration 5.12: Install Bower

13. Then install bower using NPM already installed using command “sudo npm install -g bower”.

```
michael: /var/www/vhosts/concerto/src/Concerto/PanelBundle/Resources/public/angularjs
angular#1.5.5 bower_components/angular
└─ angular#1.5.5
└─ ckeditor#full/4.5.5
angular-ui-router#0.2.18 bower_components/angular-ui-router
└─ angular#1.5.5
angular-wizard-concerto#0.6.1-concerto bower_components/angular-wizard-concerto
└─ angular#1.5.5
angular-ui-grid#3.1.1 bower_components/angular-ui-grid
└─ angular#1.5.5
jquery.metadata#e5a9e43156 bower_components/jquery.metadata
jquery-mousewheel#3.1.13 bower_components/jquery-mousewheel
└─ jquery#2.1.4
angular-breadcrumb#0.4.1 bower_components/angular-breadcrumb
└─ angular#1.5.5
└─ angular-ui-router#0.2.18
jquery#2.1.4 bower_components/jquery
ckeditor#full/4.5.5 bower_components/ckeditor
ng-context-menu-concerto#1.0.6 bower_components/ng-context-menu-concerto
└─ angular#1.5.5
```

Illustration 5.13: Install Javascript Dependencies (NPM, Bower)

14. Another dependency that needs to be installed is dependency on javascript. Installation using bower and NPM. Install javascript dependencies by entering angularjs folder and command “bower install”. Then bower will automatically install javascript dependencies.

```
michael: /var/www/vhosts/concerto/src/Concerto/TestBundle/Resources/R
root@michael:/var/www/vhosts/concerto/src/Concerto/TestBundle/Resources/public/angularjs# cd /var/www/vhosts/concerto/src/Concerto/TestBundle/Resources/R
root@michael:/var/www/vhosts/concerto/src/Concerto/TestBundle/Resources/R# sudo R CMD INSTALL concerto5
* installing to library '/usr/local/lib/R/site-library'
* installing *source* package 'concerto5' ...
** R
** preparing package for lazy loading
** help
*** installing help indices
** building package indices
** testing if installed package can be loaded
* DONE (concerto5)
root@michael:/var/www/vhosts/concerto/src/Concerto/TestBundle/Resources/R#
```

Illustration 5.14: Install Concerto R Package

15. After install all the dependencies both PHP and Javascript enter concerto folder then install concerto R packages using command “**sudo R CMD INSTALL concerto5**”.

```
[CLI Server]
; Whether the CLI web server uses ANSI color coding in its terminal output.
cli_server.color = 0n

[Date]
; Defines the default timezone used by the date functions
; http://php.net/date.timezone
date.timezone = "Asia/Jakarta"

; http://php.net/date.default-latitude
date.default_latitude = 31.7667
```

Illustration 5.15: Reset PHP.ini

16. After all dependencies are installed then install package concerto R. Then do the timezone configuration in the php.ini file. Set the date time by change the configuration to “**date.timezone = “Asia/Jakarta”**”.

```
root@michael:/var/www/vhosts/concerto/src/Concerto/TestBundle/Resources/R# cd /var/www/vhosts/concerto
root@michael:/var/www/vhosts/concerto# php app/console concerto:setup
concerto setup (dev)
updating database...
Updating database schema...
Database schema updated successfully! "67" queries were executed
database up to date
checking for user roles...
ROLE_TEST created
ROLE_TABLE created
ROLE_TEMPLATE created
ROLE_WIZARD created
ROLE_FILE created
ROLE_SUPER_ADMIN created
checking for default user...
default user created
root@michael:/var/www/vhosts/concerto#
```

Illustration 5.16: Setup Concerto

```

viridisLite::viridis
viridisLite::magma
viridisLite::inferno
viridisLite::plasma
Saved: 4414/4414 | 100%
R documentation cache generated.
root@michael:/var/www/vhosts/concerto#

```

Illustration 5.17: Setup Concerto

17. The final stage of the installation is to install a concerto platform. Go to the concerto folder then do the setup using command “**php app.console concerto:setup**”.

```

root@michael:/var/www/vhosts/concerto# cd /var/www/vhosts/concerto
root@michael:/var/www/vhosts/concerto# php app/console concerto:content:import --convert
importing content...
importing Test_create_graph.concerto.json...
imported Test_create_graph.concerto.json successfully
importing ViewTemplate_buttons_multiple.concerto.json...
imported ViewTemplate_buttons_multiple.concerto.json successfully
importing TestWizard_R_code.concerto.json...
imported TestWizard_R_code.concerto.json successfully
importing DataTable_default_user_table.concerto.json...
imported DataTable_default_user_table.concerto.json successfully
importing ViewTemplate_form_alert.concerto.json...
imported ViewTemplate_form_alert.concerto.json successfully
importing Test_polyCAT.concerto.json...
imported Test_polyCAT.concerto.json successfully
importing DataTable_default_questionnaire_response_table.concerto.json...

```

Illustration 5.18: Setup Concerto Import

```

imported Test_merge_lists.concerto.json successfully
importing ViewTemplate_form_field_input.concerto.json...
imported ViewTemplate_form_field_input.concerto.json successfully
importing ViewTemplate_linear_test_content.concerto.json...
imported ViewTemplate_linear_test_content.concerto.json successfully
importing ViewTemplate_buttons_single.concerto.json...
imported ViewTemplate_buttons_single.concerto.json successfully
content importing finished
root@michael:/var/www/vhosts/concerto#

```

Illustration 5.19: Setup Concerto

18. at the end of the setup do import the files and database using command “**php app/console concerto:content:import --convert**”.

## 5.2 Testing

The image shows two overlapping screenshots of a web application interface. The top screenshot is a login form titled "Please enter your credentials" with a version number "v5.0.beta.2.186". It contains two input fields labeled "Login:" and "Password:", and a blue "Log in" button. The bottom screenshot is a "Creating new test" form with the following fields: "Name" (psikotes), "Protected" (checkbox), "Archived" (checkbox), "URL name" (empty), "Visibility" (Regular), "Resumable" (checkbox), "Type" (flowchart), "Accessibility" (public), "Owner" (None chosen), and "Groups" (empty). There are "Save" and "Cancel" buttons at the bottom right.

Illustration 5.20: Login User

After the concerto is installed, it can be accessed via `http://localhost/login`. Login with admin user, admin password.

Illustration 5.21: Create New Test

After entering the administrator can create a new test with create new test then the form input input test name, url, type, group and other input.

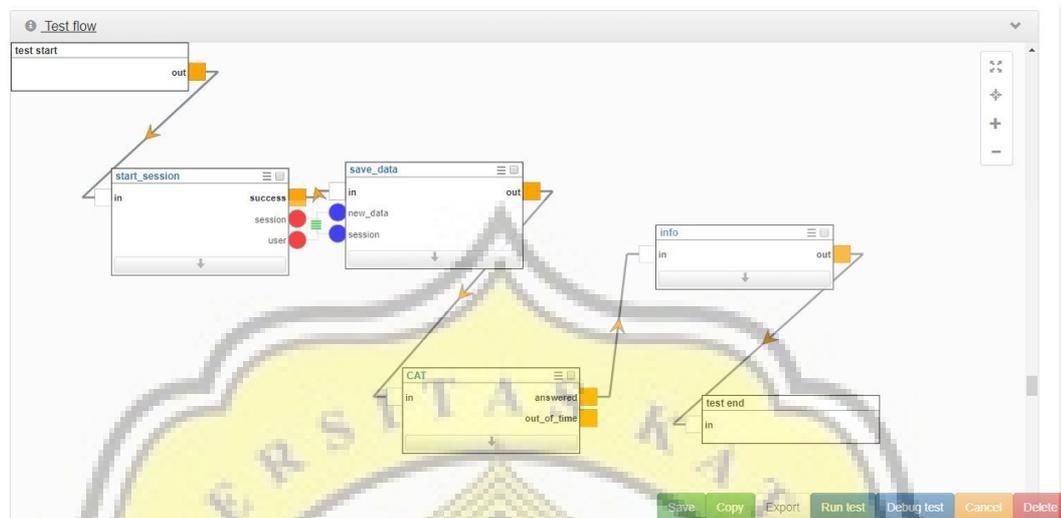


Illustration 5.22: Create Flow Test

The next step is to make test flow. At this stage the administrator can manage the flow of test participants in the test. The first is the start session is input username and password, and so on until the end of the test.

Table - list elements

[Add new element](#)
[Remove selected elements](#)
[Remove all elements](#)
[Download](#)
[Upload CSV](#)

Id	Question	Response options	a	b	c	d	Correct a...	CB group	
1	<p>5 - 18</p>	Elements count: 2	1.7	-2	0	1	25	mathematics	Delete
2	<p>5 + 5</p>	Elements count: 2	1.7	0	0	1	10	mathematics	Delete
3	<p>18 / 3</p>	Elements count: 2	1.7	2	0	1	6	mathematics	Delete

Illustration 5.23: Input Test Item and Answer

After creating a flow test administrator can include questions and answers that will be displayed on the exam process.

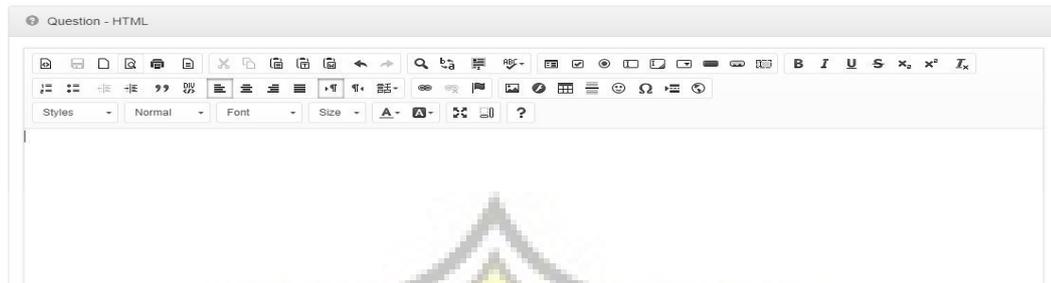


Illustration 5.24: Question Input

Admin need to fill the text editor to create a test question. Question of the test can be text, image or both image and text.



Illustration 5.25: Image Properties

To create question that contain image admin need to click the image button on the text editor menu. Then image properties popup will appear. Click browser server to continues choose image.

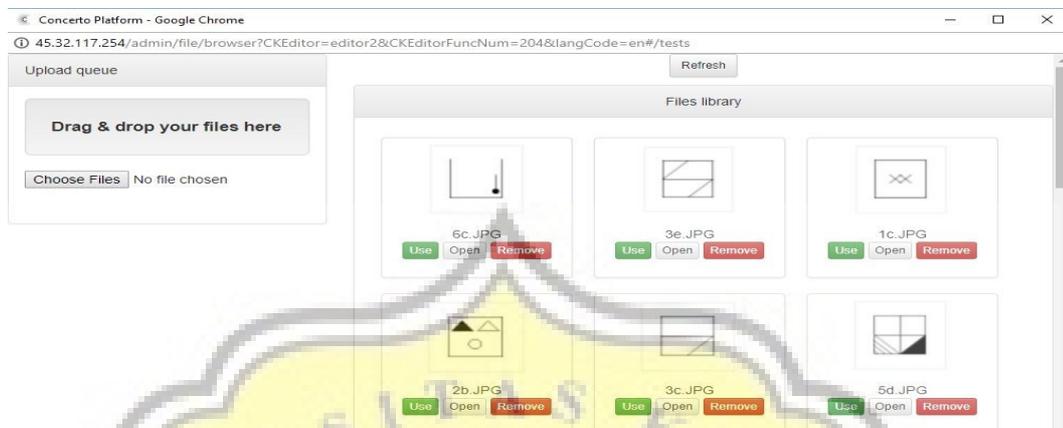


Illustration 5.26: Choose Image

The popup image browser appear click Use button to insert image in the text editor.



Illustration 5.27: Image Inserted In Text Editor

Image inserted in the text editor admin can also add the text to complete the question.



Illustration 5.28: Create Answer

After finish create question of the test continue to create answer in the form of multiple answer.

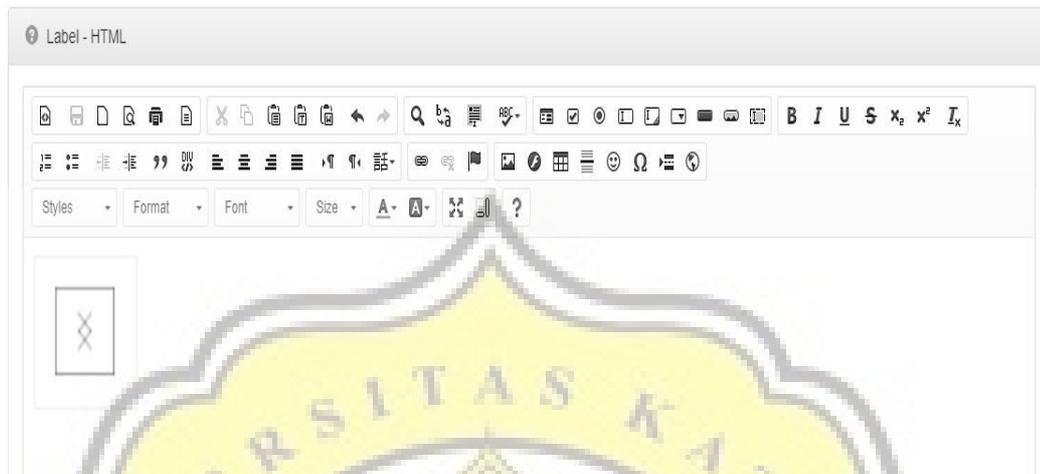


Illustration 5.29: Answer Text Editor

Answer of the question can be edit in text editor. Answer can be fill with text, image or both image and text.

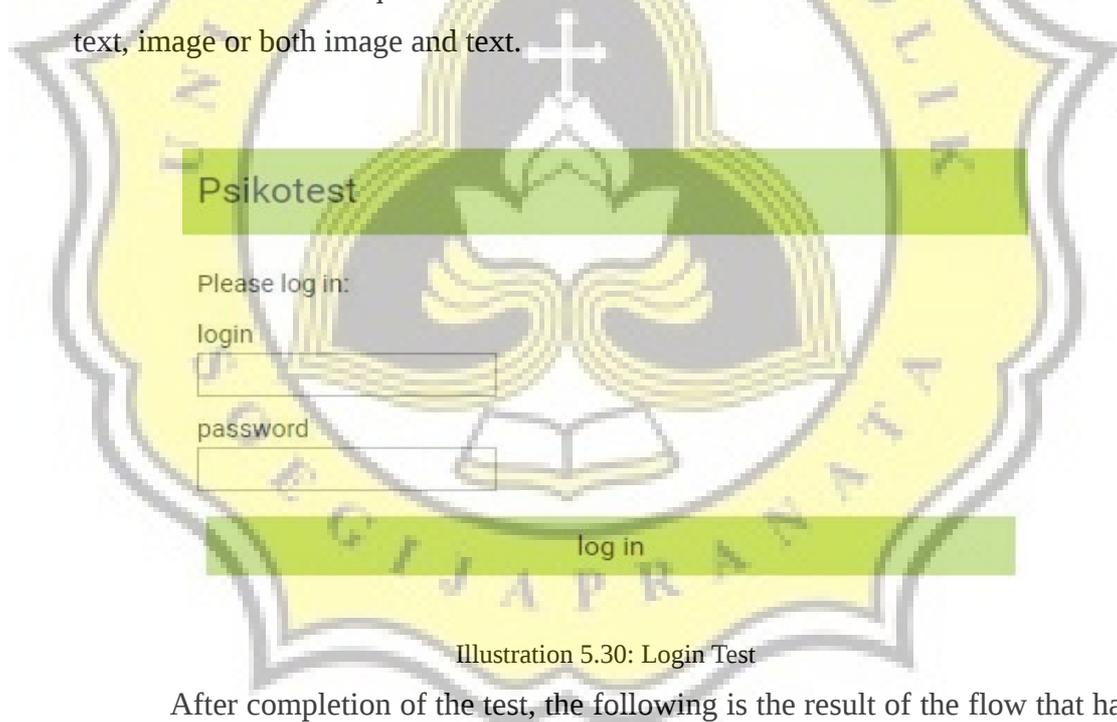


Illustration 5.30: Login Test

After completion of the test, the following is the result of the flow that has been made. The initial stage is input data login participants.

## Psikotest

Please answer the questions below:

How old are you?

What is your gender?

What is your name?

Submit

Illustration 5.31: Input Form Data

Then test participants enter biodata such as age, gender and name.

uts

Please answer the question below:

5 + 5

15

10

continue

Illustration 5.32: Answer Test

Then test participants enter answer from the test.

uts

score anda :

Theta=1.39927389319168

Sem=0.746227557330405

continue

Illustration 5.33: Final Result

After the participants answer all the questions will appear the final result in the form of test scores. Concerto platform use Theta and SEM as the result of the test. SEM is the acronym of standard error of the mean which is the method to calculate the standard error in the sampling distribution. Theta is the scale of ability level.