Security and Confidentiality in the Easy Learning on-line Platform

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Abstract
The present paper deals with the implementation of the security and confidentiality concepts in the Easy Learning platform. Being a complex application, with a large number of users that can be either visitors, students, tutors or administrators who can access different information regarding one another, in the context of eLearning it is necessary to define a standard of confidentiality. This aspect can only be accomplished by implementing a login system and by drawing a strong line between each registered user and user groups. So, whenever a student is added to the database, the system automatically creates a user and a password which he can use in order to log in. Doing so, he has access only to the information which regards him directly and can’t see, for example, the grades of his colleagues. The same system is implemented in the tutor modules. For example, the tutors can manage only the students that study their subjects. The modules that provide confidential information along with the ones dedicated to tutors and administrators are secure and can be accessed only by providing a valid user and password. By implementing these concepts, the platform is being protected and the confidential information are kept private to each individual registered user.

1. Introduction
Being an eLearning platform used in a university, the Easy Learning platform can have many users of the following types:

- visitors – simple users that access the platform
- students – student users which can log in using their personal username and password
- tutors – teacher users who can manage tests, polls and grades
- administrators – special users who can manage series, groups, students and administrative tasks

Each user type has a special interface and can access specific information related to it in order to keep those information confidential.

2. The sfGuardPlugin
The Easy Learning platform is developed using one of the most powerful PHP5 frameworks, Symfony 1.4. One of its features is represented by the support for useful plug-ins such as sfGuardPlugin.

The sfGuardPlugin is a Symfony plug-in that provides authentication and authorization features above the standard security feature of Symfony. It provides the model (user, group and permission objects) and the modules (backend and frontend) to secure this aspect of the Easy Learning application in a minute in a configurable plug-in. This plug-in has been configured to suit the
specific Easy Learning needs by creating three user groups and three types of permissions for the following user types: student, tutor and administrator.

The users can be managed by the administrators by accessing the dedicated user’s module in the “administrator” interface.

![User list view](image)

**Fig. 1. The user list view**

Each user has a username, a password, can be part of one or more user groups and can be managed by the administrators.

### 3. Security

The Easy Learning platform has three different interfaces dedicated to the three main types of users. Each interface is secured by denying access to the users which do not have authentication information.

Each user group has its own permission associated allowing users from those groups to access the interface dedicated to them.

The administrator and teacher interfaces have been protected because at that level are managed very important information and if an unwanted person gains access to these tools, he can do irreversible damage to the structure of the platform.

As for the student interface, it has been secured to preserve the confidentiality of each student.

### 4. Generating Users

The users belonging to the student, tutor and administrator groups can be created and managed by the administrators who have access to the “Useri” module.

The student’s users though can also be created automatically when the students are inserted in the database. At the moment a student is created, its user is created automatically and its username and password have the following format: “lastname_firstname1_firstname2”.

This way of defining the student’s user has been created due to the large number of students which may be managed in the Easy Learning platform. Before implementing this solution the administrators had to manually define users for each student in the database, a simple task, but due to the large number of students, it could raise problems in terms of the time spent on completing it.

![Administrator interface login form](image)

**Fig. 2. The administrator interface login form**

![User creation form](image)

**Fig. 3. User creation form**
5. Confidentiality

Each user type can have many users associated with it. The users belonging to the student and tutor user groups have specific information which regard them directly or indirectly such as for example grades, classes they attend to, created or solved tests. It is very important that this information are clearly delimited between each user of the same type.

This problem has been solved with the usage of the sfGuardPlugin and implementing it on the modules belonging to the two interfaces. After logging in, the tutor can access the modules which can be used to access and manage the information strictly dedicated to him. This way, the interface is more clear and easy to use, and the registered tutor cannot view or manage information belonging to their colleagues, keeping them safe.

In figure 4, the registered tutor user can access and manage only the tests he created. This way, the registered tutor cannot interfere with the work of his colleagues. This implementation is made possible by the relationship between the tutor, classes, series and students defined at the database level of the Easy Learning platform.

The students can access the documents, catalogue, tests, and poll and tutor modules only by logging in. The information displayed are strictly the ones concerning the authenticated user, this way the confidentiality is maintained.

In the above picture are presented the tests an authenticated student can solve. They are available to him based on the series or group associated to the tests and the series or group the student belongs to. This way, he cannot access the tests which are not dedicated to him.

6. Conclusion

The security and confidentiality standards are very important in the modern eLearning platforms and implementing them in Easy Learning brings the project composure and security. Besides, the platform becomes clearer and the work of each user is protected and kept confidential.

7. References


