

*e-learning interactivity,  
pre-test, smart interactions*

Paweł PAWEŁCZYK<sup>\*</sup>, Tomasz PARA<sup>\*</sup>,  
Rafał POTEPA

## **THE SOFTWARE INTERFACE FOR PRE-SELECTION OF THE USER QUALIFICATIONS**

The learning process by Internet needs various interfaces used for current knowledge analysis. The elaborated unit allows the user to make a simple check-up of his present qualifications. That is useful for indicating the adequate resources, the most suitable for his next learning process, within the Internet Distance Learning University. This interface can provide the user with a static information data and dynamic sequences of the e-content, as well.

### **1. PRELIMINARY TEST OF KNOWLEDGE**

Process of learning is an element, which suitable form can give amazing results in a short term of time. The obtained knowledge gives opportunity to solve different problems which can be met not only during work, but also in life. The development of network technologies let to learn bigger and bigger groups of people. Fast and efficient network allow to transfer huge amount of data (including graphics, sound and video animation). These fast connections give us obvious and well-know advantages of distance learning: watching lectures on-line (video transmission) and saving time on travelling to university. Virtual university allow students to learn in any time and place they want (of course if they have computer and access to internet). Speed of life is increasing all the time, so people want to save every second they can-that is way they want to use distance learning methods. Here comes the problem: how to adjust the level of lecture/knowledge for each student (That obvious that is not recommended to provide all students with the same portion of knowledge, because it takes risk that good students would be provided with not enough detailed material for them and bad students would get too complicated one). That is why the preliminary test is recommended. Single choice test are not enough good solution and it is better to use multiply choice test (these tests are reliable and allow to find "black holes" in knowledge of student). But there is one disadvantage of that solution: right now it is almost impossible to be sure that person who is answering the questions is the person who should be. However the problem is under work, so it should be found solution soon.

Lately it has been enclosed new module to CKD platform, which allows check the student using preliminary test (single and multiply choice tests). The module base on PHP and SQL database.

---

<sup>\*</sup> University of Silesia, Institute of Informatics, 41-200 Sosnowiec, ul. Będzińska 39

## 2. ADMINISTRATOR PANEL

The Administration unit, which is responsible for creating and managing tests, has two types of users.

User ‘ADMINISTRATOR’ is able to add and delete:

- subjects
- users (they can create own tests and add questions to database)
- range of IP addresses (it allows to solve tests only from computers which have IP address defined in database)

Test Online	
menu	opcje
użytkownicy	uruchom
przedmioty	uruchom
IP	urochom

[Powrót do konsoli administracyjnej](#)

Fig. 1. Administration panel

The other type of users is ‘TEACHER’ who also can add and delete:

- questions
- tests
- IP addresses
- courses (smaller part of subjects)

Menu				
<a href="#">Pytania</a>	<a href="#">Testy</a>	<a href="#">Wyniki testów</a>	<a href="#">IP</a>	<a href="#">Działy</a>

Fig. 2. Teacher’s menu

## 3. TEST PANEL

Test panel is a unit which is responsible for process of testing students. To use this part of system user is obliged to log in to the system and choose one of the tests. IP address of user’s computer must be in the range of allowed IP addresses. Of course, there is a time limit for answer. Student is allowed to move to next or previous question. After finishing test, student is provided with statistics concerning correct and incorrect answers. Then the result is saved into database, where can be browsed by teacher.

**pozostały czas: 00:52**

**pytanie nr: 1 / 5**

Która z instrukcji powoduje zmianę atrybutów plików:

REVOKE.

GRANT.

FLAG.

FLAGDIR.

RIGHTS.

[dalej](#)

Fig. 3. Question

## 4. ELEMENTS OF ADMINISTRATIONS PANEL

### 4.1. USERS

Administrator of the system is able to create accounts of new users (teachers) and modify their data and list of available subjects.

lista użytkowników							
	lp.	nr	login	dane użytkownika	email	przedmioty	opcje
<input type="checkbox"/>	1	49	wykładowca	mgr Jan Kowalski	kowal@us.edu.pl	Elektronika Architektura Komputerów	edytuj usuń
<input type="checkbox"/>	2	52	orion	dr Andrzej Pilch	brak	Architektura Komputerów Grafika Komputerowa	edytuj usuń
<input type="checkbox"/>	3	53	frodo	prof. dr hab. Jan Nowak	brak	Elektronika Architektura Komputerów DTP	edytuj usuń

zaznacz wszystko / odznacz wszystko dodaj użytkownika

[powrót do menu](#)

Fig. 4. User's listing

### 4.2. SUBJECTS

Administrator can add new subjects and link them with teachers (so they are able to edit them).

lista przedmiotów						
	lp.	nr	nazwa przedmiotu	ilość pytan	działy	opcje
<input type="checkbox"/>	1	50	Elektronika	11	Tranzystory Ogólny - Elektronika	edytuj usuń
<input type="checkbox"/>	2	49	Architektura Komputerów	3	Ogólny - Architektura Komputerów	edytuj usuń
<input type="checkbox"/>	3	51	Grafika Komputerowa	0	Ogólny - Grafika Komputerowa	edytuj usuń
<input type="checkbox"/>	4	52	DTP	0	Ogólny - DTP	edytuj usuń

zaznacz wszystko / odznacz wszystko dodaj przedmiot

[powrót do menu](#)

Fig. 5. List of offered tests

4.3. IP'S RANGES

System provide teachers with mechanism which allows to control the computer on which the test will be accessible (it uses checking the IP address of computer and compares with range of IP's from database). It preserve from access to the test by someone who is outside the classroom (and could answer instead the student).

The most frequently uses addresses are saved in database and can be use during creating another test.

lista IP						
	l.p.	nr IP	nazwa IP	od	do	opcje
<input type="checkbox"/>	1	27	Sala 305	196.198.155.1	196.198.155.10	edytuj usuń
<input type="checkbox"/>	2	28	Sala 105	155.158.112.10	155.158.112.20	edytuj usuń
zaznacz wszystko / odznacz wszystko						dodaj IP
<input type="button" value="usuń zaznaczone"/>						
<a href="#">powrót do menu</a>						

Fig. 6. IP's ranges

5. ELEMENTS OF TEACHER PANEL

5.1. QUESTIONS

Teacher is able to browse questions which are assigned to one of the subject. The questions can be browse in two modes:

- preview – just like during test,
- data – all data concerning question are visible

Creating new questions is needed to give full information about question: subject, type (single or multiply choice), number of answer and optional link to other question (to the question which should be shown if the answer is correct).

Wybierz przedmiot:

lista pytań					
	l.p.	nr	nazwa działu	treść	opcje
<input type="checkbox"/>	1	471	Ogólny - Elektronika	<table> pytanie 471	zobacz dane edytuj usun
<input type="checkbox"/>	2	472	Ogólny - Elektronika	Pytanie 472	zobacz dane edytuj usun
<input type="checkbox"/>	3	473	Ogólny - Elektronika	Pytanie 473	zobacz dane edytuj usun
<input type="checkbox"/>	4	474	Ogólny - Elektronika	Pytanie 474	zobacz dane edytuj usun
<input type="checkbox"/>	5	490	Ogólny - Elektronika	Pytanie kolejne	zobacz dane edytuj usun
<input type="checkbox"/>	6	488	Tranzystory	Wiedząc że: i=1 oraz j=2 to po wykonaniu operacji x=++i + j++ zmienna x ma...	zobacz dane edytuj usun
<input type="checkbox"/>	7	487	Tranzystory	Przedstawiony fragment <TABLE ALIGN=LEFT BORDER=2> <TR>&l...	zobacz dane edytuj usun
<input type="checkbox"/>	8	482	Tranzystory	Polecenie FLAG służy do:	zobacz dane edytuj usun
<input type="checkbox"/>	9	484	Tranzystory	Która z poniższych operacji będzie możliwa (zgodność operacji z uprawnieniami):  ...	zobacz dane edytuj usun
<input type="checkbox"/>	10	485	Tranzystory	Która z instrukcji powoduje zmianę atrybutów plików:	zobacz dane edytuj usun
<input type="checkbox"/>	11	486	Tranzystory	Zapis <DIV ID="nazwa">...</DIV> oznacza:	zobacz dane edytuj usun
zaznacz wszystko / odznacz wszystko					
<input type="button" value="usuń zaznaczone"/>					
dodaj pytanie wczytaj pytania z pliku					

Fig. 7. List of questions

5.2. TESTS

It is not needed to prepare tests every time that teacher wants to use them, because every test is saved into database and can be use any time is needed. The test's record contains following data: number of questions, time, IP's range from which is accessible, previous and next question, date of test, test's activity (it is visible or not on the web page), subject for which test is designed.

wybierz kategorię:

lista testów										
Lp.	nr	nazwa testu	ilość pytań	czas trwania	ogr. ip	cofanie	data	aktywny	opcje	
<input type="checkbox"/>	1	307	Test z pliku	5	1 min.	nie	tak	2005-06-27	tak - dezaktywuj	dane edytuj usun
<input type="checkbox"/>	2	306	Test z Elektroniki	2	1 min.	nie	tak	2005-06-27	tak - dezaktywuj	dane edytuj usun

zaznacz wszystko / odznacz wszystko

Fig. 8. Test's list

5.3. TEST'S RESULTS

After finishing test by students, teacher is able to browse and print the result of selected test (or any other from the database). There is also possibility to calculate per cent rate into marks using declared scale. Printing is allowed in tow modes simple and advanced.

wyniki testu								
Lp.	imię	nazwisko	punkty	wynik	ocena	data	opcje	
<input type="checkbox"/>	1	RAFAL	POTEMPA	12 / 12	100 %	bdb	2005-06-27	usun
<input type="checkbox"/>	2	MARCIN	JAROSZ	6 / 6	100 %	bdb	2005-06-27	usun
<input type="checkbox"/>	3	MONIKA	ALAŚ	9 / 12	79 %	db+	2005-06-27	usun
<input type="checkbox"/>	4	MARCIN	NIESYN	7 / 10	75 %	db+	2005-06-27	usun
<input type="checkbox"/>	5	NOEL	NOWAK	19 / 26	73 %	db+	2005-06-27	usun
<input type="checkbox"/>	6	ADAM	MUSTALSKI	7 / 12	58 %	dst+	2005-06-27	usun
<input type="checkbox"/>	7	ALEKSANDER	NOWAK	7 / 15	50 %	dst+	2005-06-27	usun
<input type="checkbox"/>	8	ALA	JADWIGA	5 / 15	33 %	dst	2005-06-27	usun
<input type="checkbox"/>	9	IGOR	KNAPIK	1 / 6	25 %	ndst	2005-06-27	usun
<input type="checkbox"/>	10	ADAM	ADAMSKI	1 / 12	12 %	ndst	2005-06-27	usun
<input type="checkbox"/>	11	EDWARD	MIŃSKI	0 / 12	0 %	ndst	2005-06-27	usun
<input type="checkbox"/>	12	MACIEK	NOGA	0 / 12	0 %	ndst	2005-06-27	usun
<input type="checkbox"/>	13	ROBERT	ASAN	0 / 11	0 %	ndst	2005-06-27	usun

zaznacz wszystko / odznacz wszystko  
 oceni  
usun oceny  
wydruk pelny  
wydruk prosty

Fig. 9. Results of test

5.4. COURSES

Every subject can consist from many courses. Teacher is able to group question into different courses. System can choose randomly question from the selected courses. It is possible to define proportion of questions from selected courses.

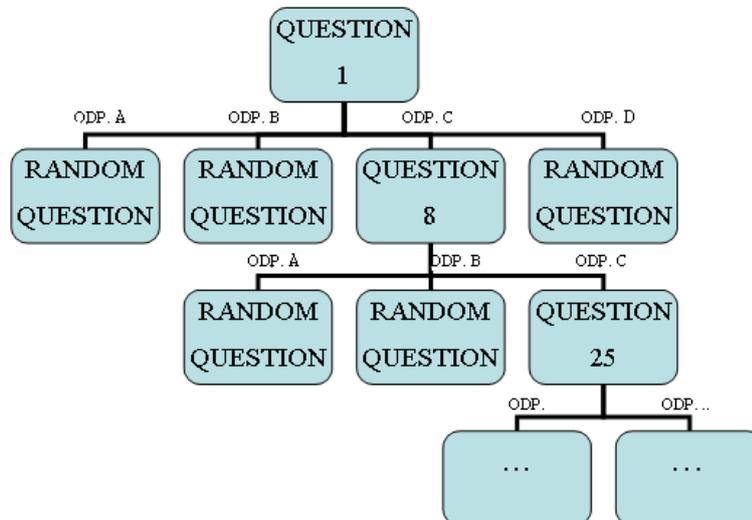
lista działów						
Lp.	nr	nazwa działu	ilość pytań	nazwa przedmiotu	opcje	
1	65	Ogólny - Architektura Komputerów	3	Architektura Komputerów		
2	81	Ogólny - DTP	0	DTP		
3	66	Ogólny - Elektronika	5	Elektronika		
<input type="checkbox"/>	4	79	Tranzystory	6	Elektronika	edytuj usun
5	80	Ogólny - Grafika Komputerowa	0	Grafika Komputerowa		

zaznacz wszystko / odznacz wszystko

Fig. 10 List of courses

## 6. QUESTION PATH

Each question can point at another question (if user choose defined answer he/she will get defined question instead of random one). In that way, teacher can define question path, so it gives a chance to ask student about more details (so teacher can be sure about student's knowledge).



## 7. SUMMARY

Use of preliminary testing, make easy to choose group of good prepared students, and also give many opportunities, to provide students with help during exams. Preparing test needs much less time than oral exam for numerous group of students. The special algorithm eliminate “shoot method” from answering the questions (teher are negative points for each wrong answer).

Using Internet offer possibility to exam numerous students and eliminate time needed for journey to university.

Questions can contain both image files (GIF, JPEG, PNG, BMP) and multimedia files (SWF) – it increase presenting power of questions.

## BIBLIOGRAPHY

- [1] PIECHA J. The Intranet Databases and some Approach Troubles into Multimedia Files. Proc. Int. Conf. *Computer Based Learning In Science - CBLIS'99*, Enschede, the Netherlands, 1999, G7.
- [2] EBERTS R.E. Learning strategies in CAI design. *The International Journal of Applied Engineering Education*, No. 2/86, Oxford 1986.
- [3] PIECHA J. Principles of e-learning applications characteristics and evaluation procedures Distance Learning Workshop DLW'04 Sosnowiec 2004
- [4] KRÓL R. The access method to internet databases developed within the macromedia environment. *Journal of Medical Informatics and Technologies*. Vol.5, ISBN 83-909518-2-7, pp. IT 91-98., Szczyrk 2003