

The computer software “Egzamin” for the assessment of education in the maritime schools

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Abstract

This paper presents innovative software “Egzamin” for examination used in Post-Secondary Maritime School in Szczecin. Presented software, unlike other similar programs, allows the assessment of student skills based on the task as a test of closed and open. The software is based on a databases working in the computer local network. The software is allowed to backup all exams including student’s personal data, evaluation of all responses and time taken to solve each task. The software can also be used in e-learning.

Introduction

Post-Secondary Maritime School in Szczecin enables young people to achieve in a short period of about three years diplomas of professional officer, capable of working on ships around the world. The school is for young people who graduated from high school or technical school having final exams or not. The school prepares students to work in the deck department on vessels and marine engineering ashore, preparing for the exam for diploma officer of the watch, it opens the way for further advancement [1].

A graduate of the Post-Secondary Maritime School has full authority to apply for a certificate merchant navy officer on watch after passing the examination made through the Examination Committee of the Maritime Office, which allows for employment in this position on maritime vessels of domestic and foreign shipowners [1].

Education in Post-Secondary Maritime School in Szczecin is currently implemented for the following [1]:

- marine navigator technician;
- technician engineer.

The specialities in technician marine navigator training meets the requirements in accordance with

[2, 3] – support and operational level. After completing the first year of study and completion of two months of practice students can apply for a certificate of Mariner watch. However, after completing the studies in Post-Secondary Marine School and serving 12 months of practice graduates can apply for an officer of the watch diploma [1].

The specialties in engineer technician training meets the requirements in accordance with the requirements of the STCW Convention and the operating subsidiary level. After completing the first year of study and completion of two months of practice students can apply for a certificate of engine assistant. However, after completing the studies in Post-Secondary Marine School and serving six months of practice graduates can apply for an engineer officer on watch diploma [1].

In the Post-Secondary Maritime School, as well as in other units, there are problems related to the implementation and monitoring of the learning process:

- the need to maintain a high level of education;
- the need to develop the knowledge and practical skills;
- prepare students for examination made through the Central Examination (according to [4]);

- the need to archive test results for the checks carried out by the maritime administration offices.

In order to solve these problems in Post-Secondary Maritime School in Szczecin is tested and implemented innovative computer software “Egzamin”.

The computer system “Egzamin”

The computer system “Egzamin” was created in order to:

- objective conduct of exams based on an assessment of:
 - solving skills tests in the form of opened computing tasks;
 - the ability to use technical documentation in the form of opened and closed test;
 - knowledge in the form of a closed test;
- prepare the listener for the examination of the e-learning;
- archiving of education progress and results of the examination for certification and external audit;
- preparation of a new type examination made through the Central Examination according to [4].

The computer system “Egzamin” consists of the following modules:

- module for the preparation of questions and tasks in the form of opened and closed testing and review, and archiving of test results and credits intended for the teacher (Fig. 1);
- module to carry out credit or examination designed for the student (Fig. 2).

The teacher module is allowed to:

- preparation of questions and tasks in the form of opened and closed test;
- review the test results;
- archiving of test results.

The examination tasks are to develop as a test of open containing:

- text task in which the solution is the numerical value (Fig. 3);
- tasks of checking the ability to read information from technical documentation in which the solution is a technical parameter (Fig. 4).

The examination tasks and questions taking the form of closed tests are used to select one of four responses (Fig. 5).

The student module (Fig. 1) consists of:

- the introduction of personal data (Fig. 2);
- display the content of individual tasks, including information about the time frame for solving the problem (Figs 3–5);
- present a report at the end of the test with the following information (Fig. 6):
 - all answers;
 - the correct answer;
 - a time resolution of particular tasks and the entire test;
 - the number of points;
 - the evaluation.

The tasks and questions are prepared using Microsoft Excel. The tasks can include media files in the form of photographs, drawings and animations. Tasks are divided into categories. During the test, each category is drawn as one task.

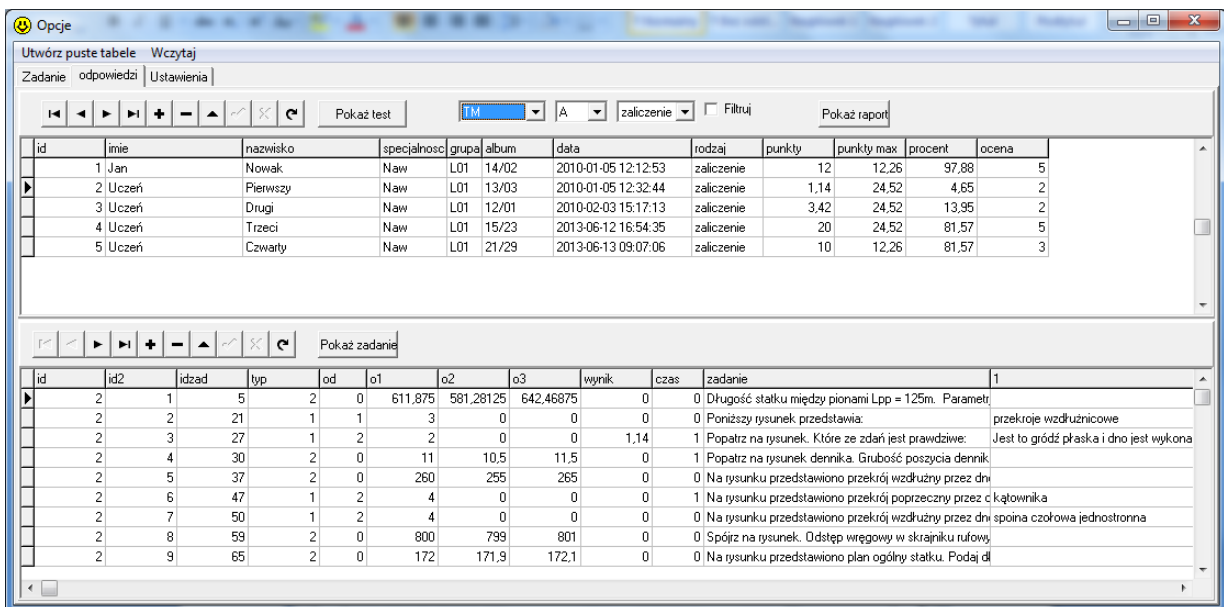


Fig. 1. The module for teacher

Test

Podaj swoje dane:

Imię:

Nazwisko:

Nr albumu:

Specjalność:

Grupa:

Rodzaj testu:

Fig. 2. The module for data entry of student

Zadanie: 1 Jan Nowak ----- L01 [Naw]

Treść: Długość statku między pionami L_{pp} = 98m. Parametry geometryczne wodnicy (zgodnie z rysunkiem) wynoszą: $y_0=1,2m; y_1=1,5m; y_2=1,7m; y_3=2m; y_4=2,2m; y_5=2,6m; y_6=2,9m; y_7=3,3m; y_8=3,5m; y_9=3,7m; y_{10}=4m; y_{11}=4,2m; y_{12}=4,5m; y_{13}=4,5m; y_{14}=4,5m; y_{15}=4,2m; y_{16}=4,2m; y_{17}=4m; y_{18}=3,8m; y_{19}=3m; y_{20}=2m$. Korzystając z metody trapezu oblicz pole powierzchni wodnicy (w m^2).

Podaj odpowiedź:

Pozostalo: 11 min. 16 sek.

Fig. 3. The examination task of text in which the solution is the numerical value

Zadanie: 8 Jan Nowak ----- L01 [Naw]

Treść: Spójrz na rysunek. Pojemność wszystkich ładowni wynosi [m³]:

Podaj odpowiedź:

Pozostalo: 2 min. 3 sek.

MAIN DATA	
LENGTH O.A.	abt 183,00 m
LENGTH B.P.	172,00 m
BREADTH MOULDED	32,20 m
DEPTH	17,60 m
DRAUGHT	11,00 m
DEADWEIGHT	abt 39460 mt
CARGO TANKS CAPACITY (85 VOLUMENCL SLOPE)	abt 51500 m ³
SERVICE SPEED (85 MCR; 15 SEA MARGIN)	14,5 kn

Fig. 4. The examination task of checking the ability to read information from the technical file which solution is the technical parameter

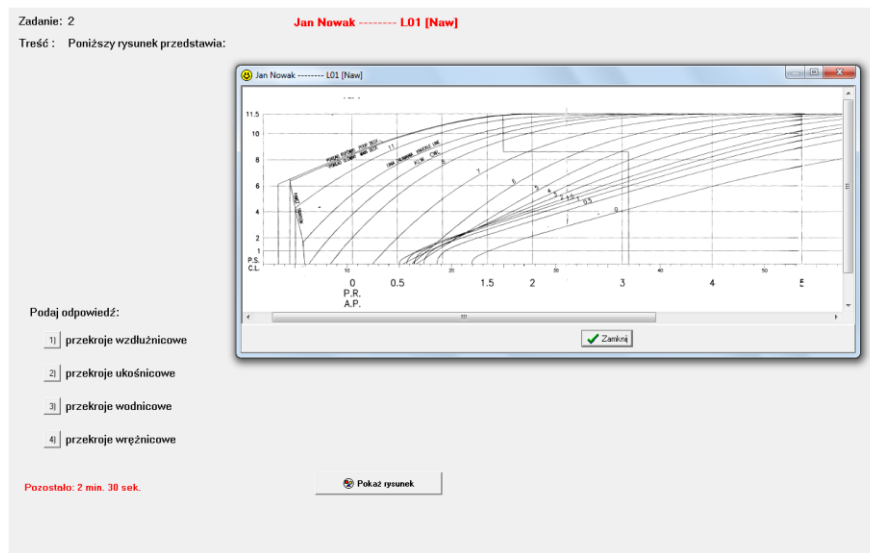


Fig. 5. Closed test to check the knowledge and skills of the technical documentation

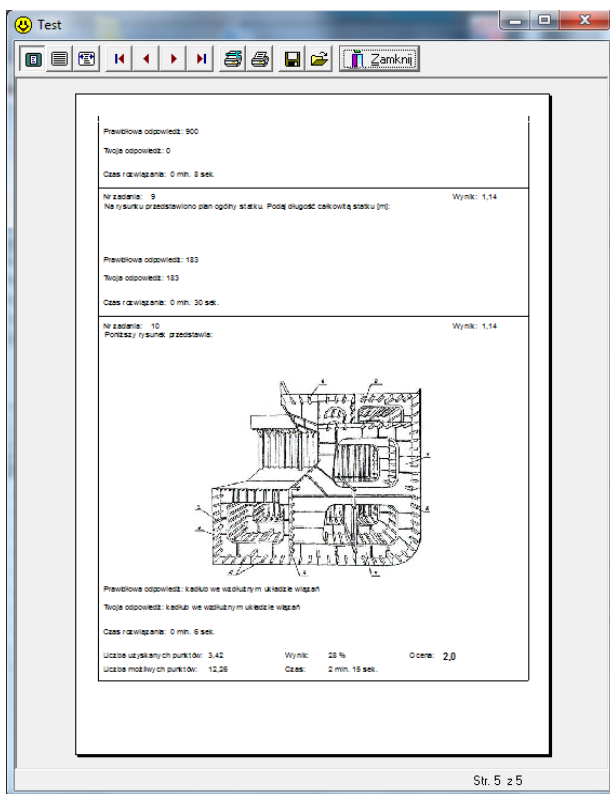


Fig. 6. Report with a summary of the test result

All modules are based on two data sets:

- database of questions;
- answers database with information about the student.

Database system based on Borland Database Engine and works in the local web. This allows to store test results in a database and makes it easy to backup.

The computer system “Egzamin” has been developed using object-oriented Borland Delphi programming package. The system was tested on

a group of navigators exam candidates with the subject “Budowa i teoria okrętu”.

Conclusions

Innovative computer software “Egzamin” presented in this article was developed to assess students’ learning in the maritime schools. The special effect of education in the maritime schools is the ability to solve problems in the form of open testing and use of the technical documentation of the ship.

Presented computer software, unlike other similar programs of this type, is allowed to:

- an objective assessment of knowledge and skills based on assessment:
 - the opened-solving skills tests in the form of word problems;
 - the ability to use technical documentation in the form of opened and closed test;
 - of knowledge in the form of a closed test;
- prepare the listener to self-test as a part of e-learning;
- archiving of scientific progress and results of the examination for certification and external audit;
- preparation of a new type examination made through the Central Examination according to [4].

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