ORGANIZING OF INTERNATIONAL "KANGAROO" COMPETITION IN ALBANIA WITH PERSONALIZED ANSWER SHEETS AND ASSESSMENT BY SCANNER

Romeo Teneqexhi[1], Loreta Kuneshka[2] and Adrian Naço[3]

[1]Director of Distance Education Centre
[2]Lecturer of Statistics
[3]Lecturer of Algebra - Geometry & Numerical Analise
[1,3]Tirana Polytechnic University, Albania, Sheshi "Nënë Tereza", No 4. Tirana, Albania
[2]Medical University of Tirana, Albania, Rruga e Dibres, Tirana, Albania

ABSTRACT

Organizing exams or competitions with multiple choice questions and assessment by technology today is something that happens in many educational institutions around the world. These kinds of exams or tests as a rule are done by answering questions in a so-called answer sheet form. In this form, each student or participant in the exam is obliged to write his/her name and declare by filling out some circles his/her own ID, predetermined by the test organizers. In addition, when testing is carried out with different difficulty levels, the participants have to declare even the level by filling the corresponding circles. Participants are often confused how they should declare their ID being even more stressed during exam. Incorrect filling of these circles often causes wrong assessment or leave some participants without evaluation. Moreover, in massive testing, it is almost impossible for participants to see how their exams are evaluated because the optical reader reads the answer sheets generating alphanumeric information. This information only is shown to the participant not the "notes that teacher makes" on his/her exam paper. We have eliminated two shortcomings mentioned above. We prepare for each participant personalized answer sheet with his/her data including ID. Some extra small signs are printed on the paper which make that "understandable" by the scanner. After scanning, our software makes the necessary notes on scanned answer sheets evaluating them with points gathered from the given answers accordingly to the rules of competition. After the competition, all the evaluated answer sheets are available on internet and everybody can see them. The application built for this purpose was used successfully this year in Albania in the well known international competition of mathematics "Kangaroo". This competition takes place at the same time in more than 70 countries. Only in 2017 there were 6,134,576 participants all over the world.

KEYWORDS

International "Kangaroo" Competition, Personalized Answer-Sheet, ADF Scanner, Scanner Based Assessment

1. INTRODUCTION

The authors are teachers in different faculties in Tirana, Albania. For more then 15 years we have organized exams with answer sheets with a limited number of students 60-100. The student always wants to see the lecturer's notes on the exam notebook or on the answers that he/she has completed. So far we have done this with a small number of students and dealing with the result is simple when there is a physical teacher-student contact. But imagine a competition with 10000 students or more. There is a reason why we started working on this project: The Association of Mathematicians of Albania organizes every year the "Kangaroo" math competition. This competition takes place at the same time in more than 70 countries around the world with questions prepared by Kangaroo Sans Frontiers Association. This competition is held for 6 pre-university age groups. Each competitor after registering to participate in the competition is provided with a unique identification ID number from 1 to the number of participants in the competition. From the association we were asked to enable the organization of this competition with personalized answer sheets. In answer sheet besides the name of the competitor other personal data such as name of the school, class, level of difficulty and the environment where the competition is being conducted are included. These data are generated through the registration process for participation in the competition that is made via the internet. Assessment

of these tests in many countries around the world is done through optical readers that simply generate alphanumeric information through OMR (Optical Mark Recognition) processes without memorizing the graphic image of the answer sheet. The application we have developed memorizes each answer sheet as a picture, identifies it with very high accuracy, generates alphanumeric data related to corresponded answers to the questions and makes on answer sheet the relevant notes in red color, like a teacher always do. After the competition every Answer Sheet is available in internet, while preserving privacy.

2. REGISTRATION FOR PARTICIPATION IN COMPETITION

Registration for participants in the competition is done via the internet with the help of some administrators responsible for some of the main municipalities of Albania. They enter in Data Base the name of participant, father's name, surname, school, class, and the available environment where the competitor wishes to develop the competition. This information is quite sufficient for printing personalized forms grouped by the environments where the competition will take place. The program that prints the forms is available online to be downloaded from everyone but only some authorized persons have the right to print valid forms. All the others can print demo version of answer sheet, just to be familiar with the answer sheet form before the competition.

3. PERSONALIZED ANSWER SHEETS FORM AND THEIR PRINTING

Every answer sheet is a unique one, containing the name, father's name, surname, some other information related with the participant and a unique ID serial number. It contains graphic elements for identification of the paper by the scanner (figure 1b). Their printing is done by local administrators. Everybody can download this software, can print demo version of answer sheets, but a valid ones only if he/she knows the unique password which is managed by the main IT administrator. This password is notified to local administrators only after the registration process is closed. Printing is very simple. The user must choose the district and the environment where competition will take place and click "Print" button. For each environment, the administrator prints the corresponding list of participants for organizing purposes.
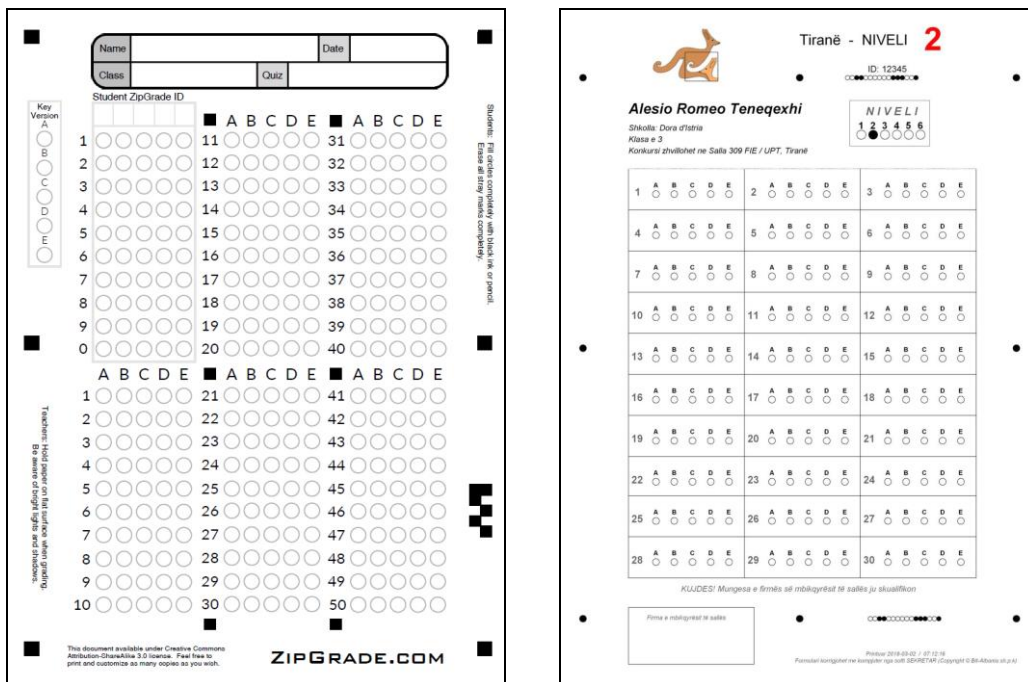

Figure 1 (a & b). Difference between no personalized and personalized answer sheets

4. ECXAM - TESTING

The participant gives the answers to questions by making a small note within the respective circle of the alternative that he thinks is the exact answer to the question. If the answer is correct, the learner gets the amount of points pertaining to that question (questions have different amounts of points depending on their difficulty). If the answer is wrong or more than one circle is filled it takes minus one point. If the question is left unanswered, it gets zero points. If for different reasons an exercise is formulated wrongly or there is no exact answer in the set of alternatives, all the participants get the amount of points belonging to that exercise. In the lower left corner of the form there is a small box in which the supervisor of the room must obligatory sign. The presence of this signature makes the form valid for assessment.

5. SCANNER BASED ASSESSMENT

Figure 2. Answer Sheet (fragment) Evaluated with points

After the exam, all fulfilled answer sheets have to be scanned. The Scanning can be done in one place or in different places independently from local administrators. It is recommended to use scanners equipped with ADF (Automatic Document Feeder). The scanning parameters must be: Size A4, Black & White mode, JPG format file. The name you give to scanned files does not matter at all. All scanned images are compressed in "zip" or "rar" format and sent by e-mail to the main administrator. The assessment process is performed by the main administrator after collecting all scanned forms from all local centers. It is important that before starting the assessment, all the keys (right answers) for each level must be memorized in the computer. For each scanned image, the module identifies the form, reads the data from it, generates alphanumeric information and makes the relevant notes (like a teacher) on answer sheet's picture, while simultaneously generates another graphical image named in accordance with its ID. All data generated by the scanning process are automatically saved in an excel file. The competition organizers can use them for different statistical purposes and conclusions in assessments. A graphic image for each form with the corresponding correction notes is stored on the hard disk and is ready to be published on the web. Anyone can see the evaluation of each answer sheet form but preserving privacy. For this purpose, personal data is covered with a yellow stamp.

6. CLAMES

1. No vested time during exam for fulfilling identification information.

2. No mistake in identification of participant (because of miss fulfilling identification fields)

3. No pretention for the sign of declaring right answer you think, just e small spot inside the circle is enough.

3. No matter what type of writing tool you use in the exam.

4. No special optical reader is needed. Scanning process can be done with normal scanner (recommended equipped with Automatic Document Feeder - ADF).

5. Very nice and transparent way of giving exams results to participants.

7. CONCLUSIONS

This kind of testing can be implemented in universities and other schools.

REFERENCES

Optical reader of encoded tables / doctoral dissertation Romeo Teneqexhi /Polytechnic University of Tirana, Albania

Scanner based assessment in exams organized with personalized thesis randomly generated via Microsoft Word, / 11th E-Learning International Conference MCCSIS 2017, Lisbon, Portugal

"SEKRETAR" software, Copyright registration in ZSHDA / Albania (www.zshda.gov.al)

VISUAL BASIC 6 Programming Language (http://www.vbtutor.net/vbtutor.html)

http://www.kangaroo.al

http://bit-albania.com/kanguri.php