Software Tools Used for Continuous Assessment

Corina SBUGHEA★, Maria Cristina ENACHE★★

A R T I C L E I N F O	A B S T R A C T
	The present paper addresses the subject of continuous evaluation and of the IT tools that support it. The approach starts from the main concepts and methods used in the teaching process, according to the assessment methodology and, then, it focuses on their implementation in the Wondershare QuizCreator software.

1. Introduction

The digital era has brought major changes in the domain of education, too, modern computer-assisted training and evaluation methods beginning to be more and more frequently used. These methods involve the use of IT technologies in the teaching, learning and pupil/student assessment activities.

The technical tools used for education stimulate student curiosity and engage them in the lesson, thus improving the teaching process. The major advantage of computer-assisted training is interactivity as educational software products use attractive interface elements, focused on the psychological profile of the new generations of students. The use of the computer offers the possibility to customize the learning process by adapting to the level and the working pace of each and every student.

Computer-assisted assessment offers a higher degree of objectivity and efficiency than traditional assessment methods, a bigger number of students being tested in a short period of time, the results being generated automatically. An automated testing software must contain an assessment algorithm and a collection of requirements (items).

2. Theoretical framework

The teaching and assessment methodology defines the docimologic test as a complex evaluation tool, consisting of a set of tasks (items), which may establish the level of the students as well as the formation and development level of certain skills and abilities (Tănase M., 2011).

The item is an assessment tool that consists of a question, drawn up by observing a standard pattern, and an expected answer from the part of the assessed subject. Over time, in the theory and practice of the assessment process, two intertwining item grouping trends have been highlighted:

The first criterion refers to the type of required answer and, in this category, there are two types of items:

1. "closed" items – which involve choosing an answer from a number of known options (double-answer items, multiple-answer items, association items, ordering items, short answer items etc.)

2. "open" items – which involve providing an answer without knowing the possible answer options (essay-type items, problem-solving items, argumentation items, interpretation items)

The second criterion refers to the degree of objectivity of the assessor; here there are three categories of items:

1. objective items (double-choice items, multiple choice items, items used to establish correspondences, chronological order items)

2. semi-objective items (short answer items, fill-in items, structured-question items)

3. subjective items (problem-solving items, essay-type items)

For any test, the assessor must also establish an assessment scale in which to specify the score given for each correctly-solved item. Most software products that allow the creation and automatic correction of docimologic tests incorporate closed, objective, or semi-objective items.

★, ★★Dunarea de Jos University of Galati, Romania. E-mail addresses: sbughea@yahoo.com (Sbughea C.), mpodoleanu@ugal.ro (Enache M. C.).

3. Items implementation in the Wondershare QuizCreator

In this sub-chapter we intend to analyse the method by means of which the assessment items were implemented in a specialised software product. The Wondershare QuizCreator represents a software product which is intended for teachers, assessors, but also for pupils and students, allowing the creation of questionnaire-type tests, which can be used both in the training and in the assessment stage. The questionnaires may be published in different formats (Word, Excel, .exe etc.) and uploaded on a site in order to be accessed from any location where there is an Internet connection. The results of the tests, which are published in an executable format, may be automatically sent to the e-mail address specified by the assessor, who may subsequently generate centralised reports.

In order to create a test, nine different types of requirements/questions may be used, in accordance with the assessment methodology items. The software allows the establishment of different scores for each question added to the test and, for certain types of requirements, an individual score for each answer is allowed. After finishing the questionnaire, an automated report is displayed, which comprises the total number of questions, the total possible score, the percentage of correct answers and the score obtained. The assessor may configure tests so that each user who wants to solve the test must sign in by means of an ID, a name or an e-mail. Only after filling in these fields, the Start button becomes active.

When he draws up the test, the assessor will decide if the current test will be used for training pupils/students or for testing them. Thus, during the training stage, the user will be allowed to modify the answer given to the same question many times until he/she finds the correct answer but, each time, the answers will be scrambled so that they do not appear in the initial order. The application allows the creation of tests only for assessment, comprising questions for which the answer may be given once only.

When opening the application, a dialogue window will be displayed, which allows the user to choose the test-creation module. In the same window, there are some links, which may be used in order to visualize examples and online available templates.
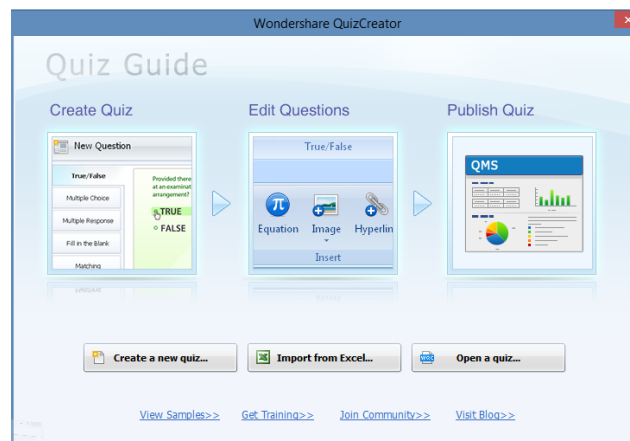

Fig.1. Create Options

There are different types of items that may be used in a test: true/false, one correct answer out of more possible answers, more correct answers, fill-in, ordering, establishing correspondences, wordbank, identifying an element from an image and essay-type. These categories are grouped under the tag Questions from the toolbar. The selection of a certain category will open a dialogue window for the establishment of that type of requirement.

In order to create a double-answer item, there is the category "True/False", which is used when the requirement is written in such a way that it has only two possible answers, out of which only one is correct. In the field "Enter the question", the requirement is filled in and in the fields from the column "Choice" the wanted answer options may be edited, "True" or "False" being the default answers, but you may also enter other options (for example, Yes/No). In the "Correct" column, the assessor must select the correct answer to the respective question, and in the section Points, he/she must establish the score if the respondent identifies the correct answer.
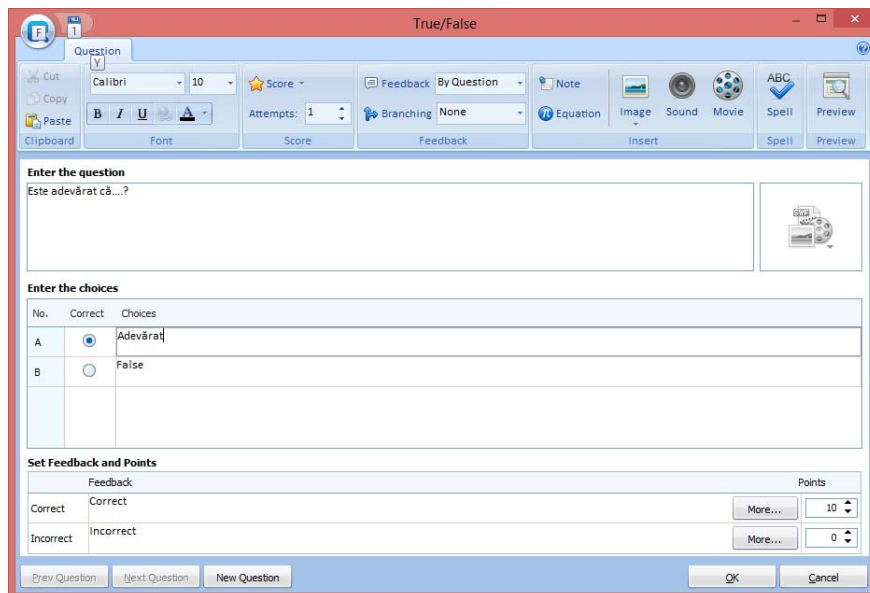
Fig.2. True/False Question

The multiple answer items, who are also part of the objective item category, may be of two types: items with one correct answer and items with multiple correct answers. The first category is implemented by means of the option "Multiple Choice" from the "Questions" tag. Thus, a multiple answer question is inserted (you may insert up to nine answers), out of which only one answer is true. This answer must be selected in the "Correct" column, and if a different score for each answer is wanted the "By Answer" option may be chosen. The "By Answer" option is subordinated to the "Score" button.
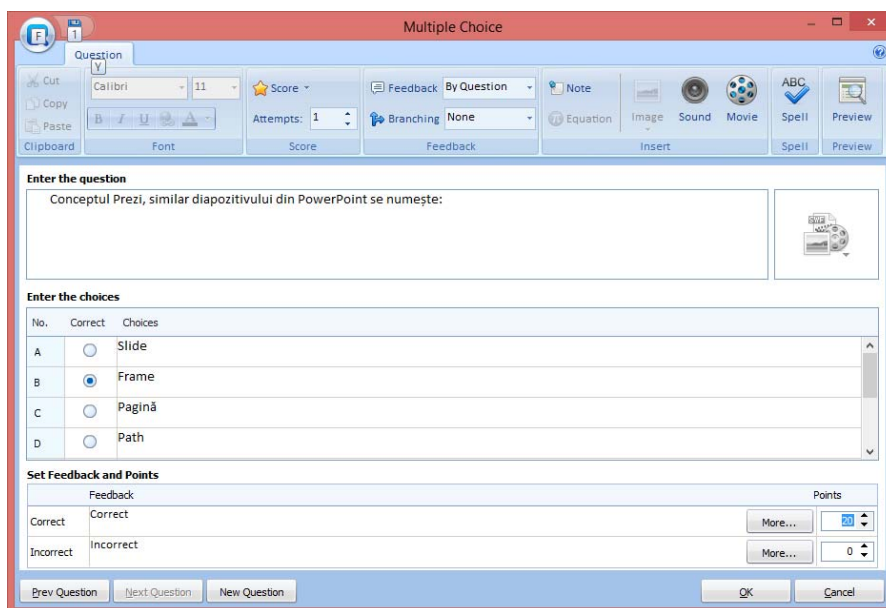

Fig.3. Multiple Choice Question

The second category, "Multiple Response" resembles the previous one, but as the symbols used in the interface suggest, that is the selection boxes, more answer options can be marked as correct. If the score per answer is chosen, from the column Score, a partial score may be given, to each correct answer. On the other hand, if the score per question is chosen, the assessed subject will have to identify all the correct answers in order to obtain the highest score.
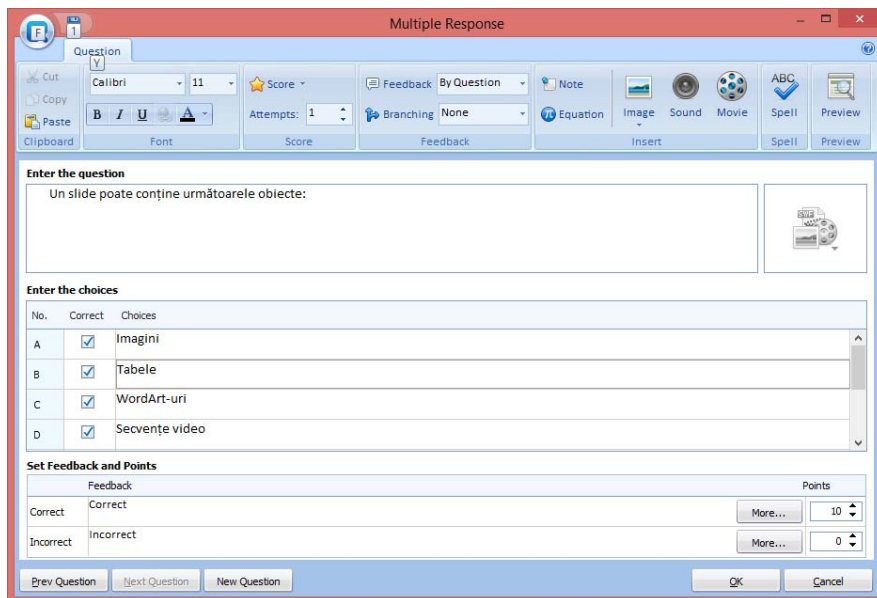
Fig.4. Multiple Response Question

The next sub-category is part of the semi-objective item category. "Fill in the Blank" is a requirement for which, in the "Enter the acceptable answers" column, there are up to nine correct answers. These answer options won't be seen by the assessed subject. When automatic correction is performed, the text written by the user will be compared with each of the accepted answer, which is specified by the assessor when creating the question, and the score will be awarded only if there is perfect similarity.
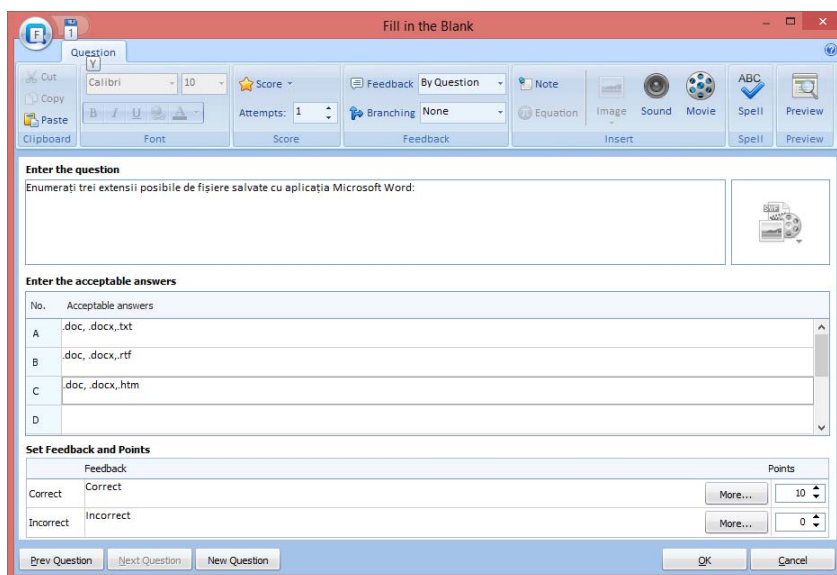

Fig.5. Fill in the Blank Question

The option "Matching" from the "Question" label allows the introduction of a requirement for establishing the correspondence between two sets of items. Unlike the classical theoretical item, which means that one of the sets must have one extra element, the Wondershare application only allows the introduction of an equal number of elements. Within the "Enter the items" section, in the "Choice" and "Match" columns, the elements of the two sets are introduced, according to the correct correspondence. During the test, the elements from the second column are re-arranged so that the assessed subject can order them by using the drag-and-drop technique. For this type of question, it is also possible to establish a partial score, a different one for each correct correspondence.
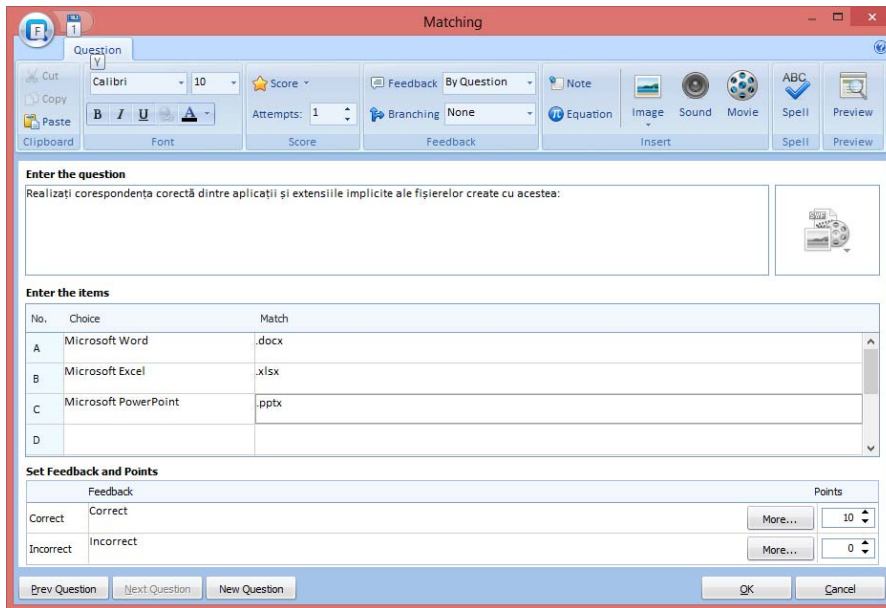
Fig.6. Matching Question

For the "closed" item category, the application also allows the introduction of the ordering requirements. The option "Sequence" from the "Question" label introduces in the test an ordering requirement of maximum nine elements, which must be specified in the "Enter the items" section, in the correct order. When taking the test, the elements will be randomly re-arranged. In order to solve the requirement, the assessed subject will also use the drag-and-drop technique. The score per answer option is no longer active for this category.
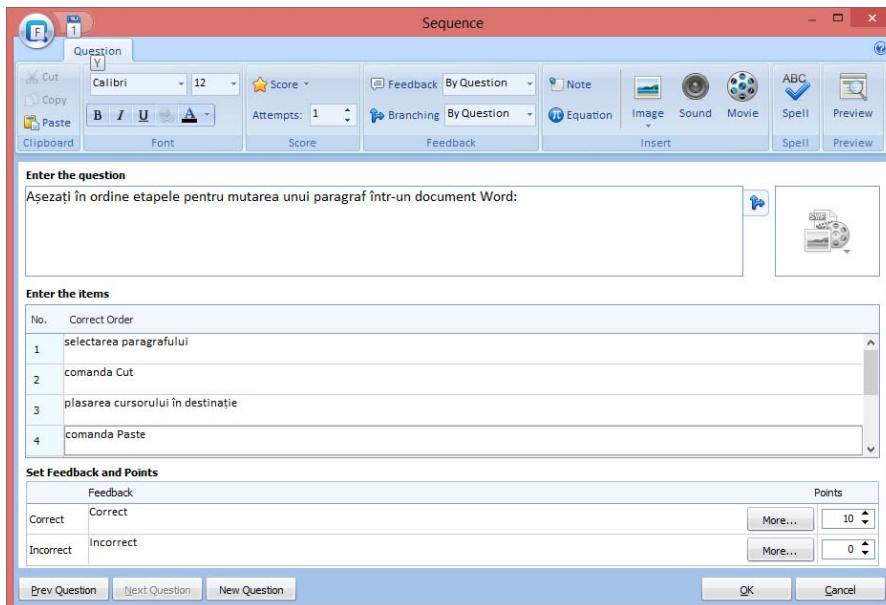

Fig.7. Sequence Question

The "Word Bank" category from the "Question" label represents a special type of question resulted from a combination of the "Sequence" and "Multiple Response" requirements. In the "Enter the question" field, the question will be edited, whereas in the "Enter the choices" field, the possible answers to the question will be written. The correct answers will be marked by numbering in the "Blank" column from the "Enter the choices" area, whereas for the incorrect answers there isn't anything specified in the respective column. When taking the test, the assessed subject will have to fill in, by means of the drag-and-drop technique, as many free columns as there were answers marked in the "Blank" column. For this type of requirement, the score is attributed only at the question level and is cumulated only if all the columns were correctly filled in.
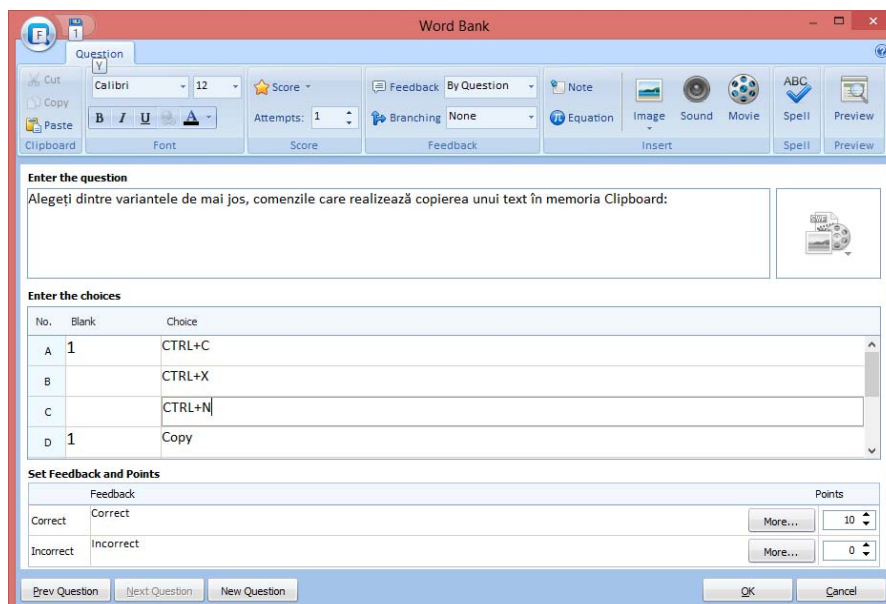
Fig.8. Word Bank Question

The next category from the "Question" label is "Click Map", which is also part of the objective item group, and can be also be considered a multiple-response question. This type of requirement presupposes the identification of certain areas from an image, which correspond to the answer to the question. The assessor must establish up to nine correct areas, in the shape of a rectangle or of a circle. The score can be attributed for each identified area or may be awarded only when all the areas were correctly selected. The image may be downloaded on your computer by using the "Import" button and, after its insertion, the correct answers (hotspots) may be specified, by selecting them with the help of the mouse. After choosing all the correct areas, the number of areas the respondent must identify is filled in, in the field "Number of hotspots". A maximum of nine hotspots may be specified and the score is awarded per question only if all the marked areas are identified. While taking the test, the assessed subject must click on all the elements from the image that are part of the answer.

The last category introduces subjective items, with the help of which the assessor can assess both the creativity and the ability of the pupil/student to convey knowledge. Thus, "Short essay" from the "Question" label introduces an essay-type requirement, case in which the assessed subject must provide a written answer in the editing area from the dialogue window of the respective question. For this type of question, the correct answer will not be indicated, although certain landmarks may be introduced in the column "Enter the reference essay". Since it is a subjective item, the score is not automatically generated. The assessor must, in this case, analyse the answers and provide the appropriate score for each individual essay.
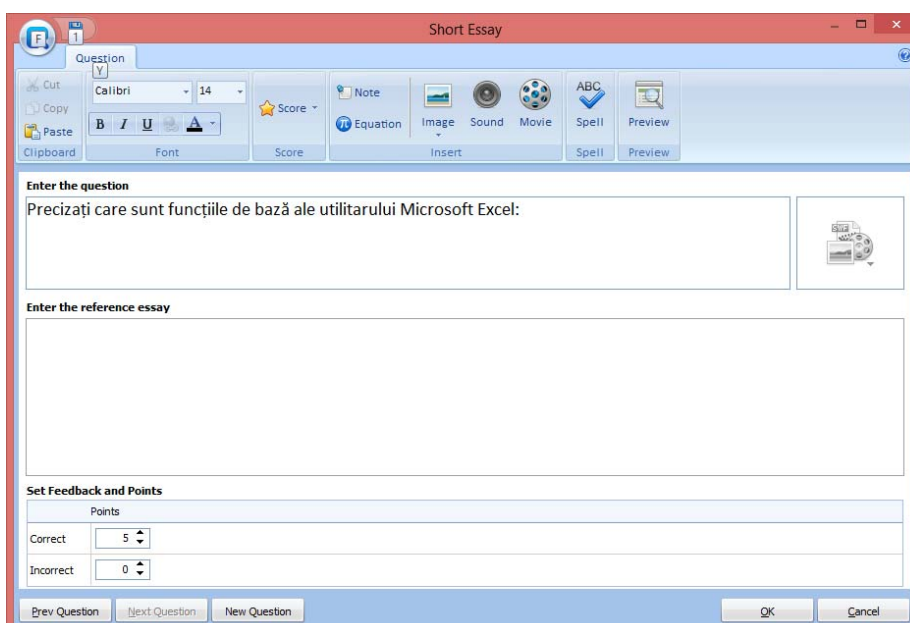

Fig.9. Short Essay Question

For each question, the assessor may offer further guidance with the help of the Note button, so that the assessed subject might understand the requirement better. Also, helpful pictures or audio/video files may be attached and equations may be edited. With the exception of the essay-type requirement, the other categories of questions may be automatically corrected, by relying on the answers specified by the assessor, so that, after the test is taken by a subject, the application could provide the mark obtained or a pass or fail type of result.

The interface of a test can be altered from the "Home -> Player Template" menu, from where one of the default templates can be chosen. In the displayed dialogue window, under the "Layout" box, the elements that were introduced on every page of the test can be specified. Also, all the interface element tags may be altered with the help of the "Text & Label" option.

In the question-insertion step, a number of formatting facilities may be used (similar to those from Word), both for the text of the requirements and for the text of the answers. For all the categories of questions, blocks of text may be copied/moved, by using the *Copy*, *Cut* and *Paste* commands from each dialogue window toolbar. In the "Feedback" box, one of the options "None"/"By Questions" may be chosen with the help of which the user may establish whether a feedback message is displayed or not for the assessed subject, message which may be edited in the "Set Feedback" box. In the case of multiple answer questions both options subordinated to the "Score" button, i.e. "By Question" and „By Answer", become active, so that the score may be established individually, per answer, or per question.

In the dialogue window of the question there is also a "Text to speech" button with the help of which the text of the question may be automatically changed in an audio format; this option is extremely useful for foreign language tests or in the case of some visual impairment. Another important facility is the equation editor, which is very useful for the creation of tests from the mathematics field.

The "Attempts" box allows the specification of the number of possible attempts in order to find the correct answer. The default number is one, and the setting of a bigger number of attempts is useful for the training tests. The assessed subjects can be penalised if they do not identify the correct answer, by introducing a negative score in the Points box.

The properties of the questionnaire are divided into five categories, in the dialogue window displayed with the help of the QuizProperties button from Home: Quiz Information, Quiz Settings, Question settings, Quiz Result and Access Control. Further on, we shall present the most important options subordinated to these categories in the automated assessment process.
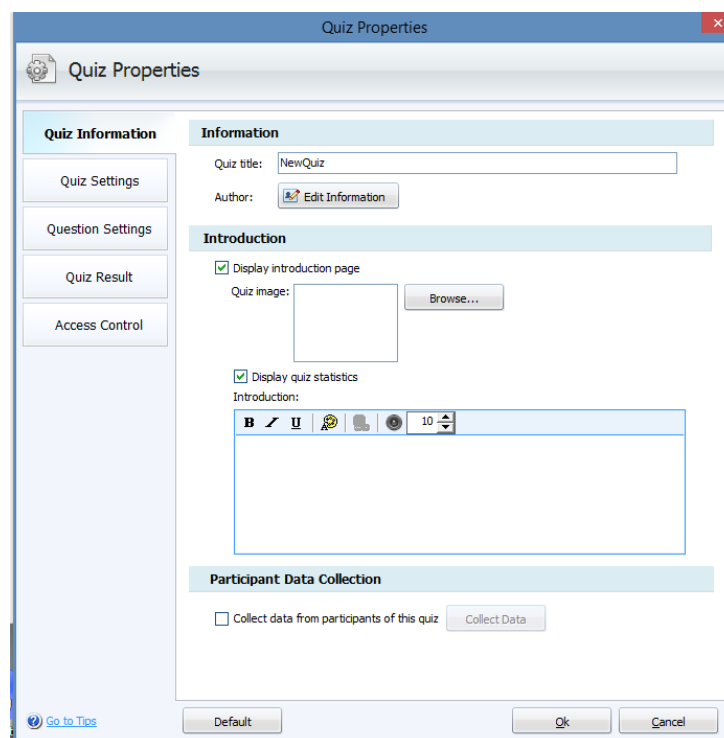

Fig.10. Quiz Properties

If there is a pass/fail test, in the field "Passing rate" from the "Quiz Settings" option, the minimum score that must be obtained by the assessed subject in order to pass the test is established. The assessor may also establish a time period in which the assessed subject must answer all the questions, by filling in the "Time Limit" box, or he/she may insert a time period for answering each question. This fact is possible only after adding all the questions in the questionnaire.

The options for re-arranging the questions and the answers are grouped in the category named "Randomization". The application allows the uploading of all the answers at once or of one answer in part, by setting the options from the "Answer Submission" area. The feedback messages will be displayed accordingly.

In the "Question Settings" category, one may find the available properties from the dialogue window of each question so that the default settings for these questions may be established. In the "Quiz result" category, the final feedback of the test is established, which may be different depending on the results or it may be single if the "Despite the result" option is selected.

The rights to access the questionnaire are set up in the last window, "Quiz Properties". The right to access the questionnaire may be restricted with the help of a single password, established by the assessor, or more users can be created so that each user has his/her own ID and password.

The created questionnaire can be saved in a file with the extension .wqc, which may be subsequently edited by adding, deleting or altering questions. In order to use the questionnaire for training/assessment activities, there is the possibility to publish it in different formats, depending on resources available in the classroom or in the lab. The possible publishing formats are grouped in the dialogue window Publish. Thus, the questionnaire can be changed into an executable file, which may be run on an independent basis, without taking into account the application with the help of which it was created, it can be shared on the Internet in order to be accessed online, or it can be saved in the form of Word or Excel documents if the user wants a printed copy of the test.

4. Conclusions

The Wondershare application provides the necessary support for teachers in the modernization and automation of the assessment process, which must be as objective as possible. Offering a wide range of items, i.e. objective, semi-objective and subjective ones, the analysed software allows the assessment of the knowledge accumulated by the respondent in a certain domain. The assessors may create a wider range of items, from all the categories, which they may save in the .wqc document, and then they may publish more tests on the same subject. At each new publishing, the questions and answers will be randomly re-arranged, thus obtaining a new version of the same test. In the teaching practice, a balanced usage of item categories is recommended, because each category has a series of advantages and a series of disadvantages, which makes them complementary.

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