Sistema de evaluaciones en línea como herramienta para los niveles de educación media superior

Online Evaluations as a tool for Higher Education

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Resumen

El presente artículo trata sobre la información recabada y el software desarrollado como resultado de las principales necesidades que debe de cubrir una herramienta informática para la elaboración de exámenes a nivel bachillerato en México. En la actualidad el uso de las tecnologías en línea en las instituciones educativas se han convertido en una herramienta de gran importancia y necesidad. Por lo tanto, esta investigación propone el desarrollo de un Sistema Web simple y fácil de usar por profesores del nivel medio superior, para la elaboración de exámenes con características de pruebas estandarizadas de tipo clase o de uso en el aula; y que permita además la evaluación utilizando un algoritmo de selección de preguntas de un repositorio.

Palabras clave: sistema web de educación, objetos de aprendizaje, pruebas estandarizadas, evaluación en línea.

Abstract

This article is about the information collected and the software developed as a result of the main needs that a computer tool must cover for the preparation of exams to Higher Education in Mexico. Nowadays the use of online technologies in educational institutions have become a tool of great importance and necessity. Therefore, this research proposes the development of a Web system simple and easy to use by teachers of the Higher Education, the preparation of exams with characteristics of standardized tests of type class or use in the classroom; and allow further evaluation using an algorithm of selection of questions from a repository.

Keywords: web system of education, learning, standardized tests, online evaluation.

Introduction

This article is derived by the thesis "Web system for the development of testing and evaluation to students of higher level" presented at the master in computer systems at the Technological Institute of Colima.

The evaluation is a process in itself that is contained in one greater process: that of teaching and learning. This is probably the one that has major implications because, being a control mechanism serves to determine the achievement of the goals, objectives and purposes of the educational fact (raison d ' être of institutions); similarly, to express a judgment on the same conditions, but referred to students or learners, wraps from a number of expectations to an accumulation of interests of different nature, some are from the academic -keep a "good average"-, up to the economic -keep a scholarship-, through pride and positive reinforcement -appear on the honor board-. If we use as a frame of reference to the basic principles of Management, evaluation is located in the phase of control which is where

should be contrasted with expected results, for that reason in education practically nobody links both phases of the administrative process applied to education: bureaucracies demand planning, operations made them but almost nobody connects them and if by chance someone is encouraged to do so, the comparison becomes generic and ambiguous way, i.e. through objective tests relate learning outcomes measured by them with the levels laid down in plans but, above all, programs of study.

To carry out as described, educational agents have diverse and varied instruments, but, without a doubt, tests or examinations are still the most aided (and apparently in reformist trends and everyday practices, they will remain so for a longer time). Today is dominated by so-called skills-based education. Never in the history of education in Mexico, an ideology (some call it theory; others, educational stream; a few more, educational model: as you want it to be, the conceptual frameworks are moving rapidly to accommodate the entry of new ideas in the educational imaginary) had such penetration at all levels of instruction: from pre-school to postgraduate fashion and as of today is the so-called job competency. This scheme of work in schools has been successful, at least in his introduction, but in its application not so much, since it was a condition imposed to Mexico by international financial institutions (in particular OECD) with the intention of improving the quality of education. Even at the upper level, the money always flows to the "autonomous" institutions and when making his own model competency, which, obviously, to set their own conditions to the assessment, giving different that until then had been used in the educational process.

So then, we speak today, for example, types of assessment: self-assessment, peer assessment and hetero; moments of assessment: diagnostic, summary, formative; intervening: internal and external agents; tools: checklists, presentations, research papers, essays, monographs, bulletin boards, and the queen of all headings. It should be noted in the case of instruments that these are both valuable resources for evaluating learning and mechanisms to build, something more important than the assessment itself.

However, one of the instrument omitted in the above list are the tests, specifically the objective. They have been intentionally excluded because despite not being the favorite

theories and texts that feed the existing framework, have been and remain the instrument which in practice is used more and even apply for collecting important information on the education system, which has to do with decision making both personal and government, in the case of the institutions or organizations involved in education. Just look at what the resource that applies today both admission processes as recruitment and promotion of students, teachers and candidates to fill positions in various academic and labor spheres. It insists that it can not be the only means used for the generation of value judgments about learning, ie qualifications.

Thus, tests or examinations are held as the most widely used in various fields of education.

Evaluation Seminar 2012, with the theme "Current problems of the evaluation of learning," explained that the evaluation forms part of the teaching-learning process. Not the end of the process but the means to improve it, because only through proper assessment decisions may be taken to effectively support the students and positively contribute to improve the quality of learning obtained. Therefore, it is important assessments throughout the educational process, and to evaluate at the end means being late in ensuring the continuous and timely learning, and prevents us from making the necessary adjustments for the student improve their learning disabilities . To assume, understand the need to take into account the assessment along all actions taken during the process of teaching and learning.

Our country has promoted recently how some amendments to the Education Act in order to raise the quality of education provided by educational institutions, which implies not only improve the intellectual capacity of the teacher, but also provide the necessary tools to be more efficient in their task of teaching-learning and evaluation of this.

State of the art

Today the use of online technologies in educational institutions have become an important tool for the ease and speed with which all operations of any kind are made. Many educational institutions make use of the tools available in the network to improve their teaching and learning. Here are some examples:

In 2013, during the International Conference in Beijing, "Advanced Learning Technologies", a comparative study of different formative assessments based multiple choice on the web, whose main purpose was to emphasize different strategies used by these systems and their effectiveness in the environment was presented e-learning[1].

In 2013, the Global Engineering Education Conference presented the "Design and Implementation of Intelligent Management System Evaluation". This study proposes the evaluation of university courses, integrated management system of evaluation in virtual line and exams in the classroom ensuring that all students are treated fairly during the review and that the proposed system will improve the effectiveness of evaluation.

Ruimin Shen (2011), based on the model of modern education, investigates the importance of an evaluation system in education based on web distance and establishes a model of intelligent evaluation system characterized by good behavior and adaptability.

In the topic called "Adaptive Assessment in Web-based Learning" presented at the International Conference on Multimedia and Expo, in 2007, it was stated that the assessment based on the Web is used in different contexts in order to support students and help make it easier for them more effective learning.

VISAGE is an automated web-based assessment, which produces several versions of an evaluation, accepts parameters and make different levels of difficulty for each question. This system was exposed in 2004 during the conference "Frontiers in Education".

Standardized tests

The use of standardized tests in education is very common and these are often of different types: domain test, test objectives, test competence, certification test, test criteria, test class or classroom use, etc. (Jornet, Suarez, 1996).

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[1]*E-learning*: education and training over the Internet. This type of online education allows user interaction with the material using various tools.

Examples of standardized tests listed below:

The CNI EGEL-examination is a test of national coverage that assesses the level of knowledge and skills of recent graduates of the Bachelor of Commerce and International Business. It is developed by the Ceneval and reviewed, updated and approved by a panel of experts representing higher education institutions, associations of professionals and specialized agencies in the field Technical Council.

It is an independent review of the evaluation process or certification by institutions of higher education. For purposes of certification, each school sets its own criteria for use.

With its standardized tests, CENEVAL (National Center for the Evaluation of Higher Education, AC) began assessing the applicants education, students and graduates of top and middle level; programs of study and institutions began to be certified by accrediting and peer committees; teachers for the Teaching Career; the elementary schools by the Quality Schools Program and the Center for Economic Research and Teaching (CIDE); graduate programs by the National Council of Science and Technology (CONACYT); children basic education, first by the National Institute for Educational Evaluation (INEE) and then by the ENLACE test (National Assessment of Academic Achievement in Schools) and even an international organization, the OECD (Organization for Economic Cooperation and Economic) Development began to assess high school students and high school in the PISA (Program for International Student Assessment) (Aboites, 2012) test.

In total, it is estimated that in 25 years from the first definitions of how to assess, were applied over 110 million standardized tests to children and youth in the country, they have been evaluated thousands of programs of study and hundreds of institutions and also hundreds of thousands of teachers at all levels have been regularly assessed; even in higher education institutions seeking to verify standards compliance of basic functions of teachers were established, sometimes under the assessment of students (Aboites, 2012).

However, in mid-2000, in an event where the anniversary of the creation of INEE held, the evaluators acknowledged that the evaluation had not brought the promised transformation,

although this was blamed state and society. Said the then director of CENEVAL, Salvador Malo:

> Today, no doubt, instruments and processes of external evaluation to educational institutions are consistently applied. Progress is also significantly improved its design and implementation, as well as the analysis of its results. However, the Mexican state and society are still far from closing the cycle of evaluation (cit. By Aboites, 2012).

The assessment, obviously, fails miserably because not establish any connection between the symptoms and the root causes of school failure. And this connection may never make the external evaluators. With the right conditions-knowing how to research and discuss the asunto-, the connection can only be established by direct actors in the educational process. They are the ones who know what is happening at school, know the reality perfectly and so are those who can generate or evaluate initiatives with much deeper than external evaluators (Aboites, 2012).

Seen from a broader perspective, the evaluation can do school groups themselves not only beyond and moves over the limited claims LINK and CENEVAL (only describe, without contributing to unleash dynamic processing), but offers the possibility of a unusual dynamism to the Mexican education. In that sense, the seed sown demonstrations of teachers during 2012 may well generate radically new perspectives for other education and, therefore, for further evaluation (Aboites, 2012).

All assessment tool can be improved. It is not to be despised standardized tests as relevant in the design of educational policy input. International experience, in both developed and developing countries, recognizes a growing use of these instruments to shore up public policies in education (Cullen & Reback, 2006; Kellagan & Greaney, 1992, 2001; Ladd, 2007; Mourshed, Chijioke & Barber, 2010; Stufflebeam, Kellaghan Madaus & Thomas, 2000) (cited by Fernandez, 2013).

The research problem

For what reason, year after year, teachers are getting on average the same results in the evaluation of your students? From which teachers have tools that enable them to improve the assessment process?

In 2010, during the International Conference on Education and Information Technology "ICEIT" for its acronym in English (International Conference of Educational and Information Technology), it was stated that the web-based learning tends to draw more and more attention, both instructors and the students. However, the evaluation system involved in learning and web-based is still far from perfect. According to the principles of learning based on this and focused on the learning process, diversification of methods and objects of evaluation are based on a system of indicators with the aim of promoting quality.

In the last decade, Mexico has made significant efforts to the creation and implementation of evidence to reliably assess the quality of education. The Mexican government acquired in September 2000 a series of complementary to those established in the so-called "Millennium Development Goals" commitments. Among the goals he highlighted promised to "make a significant majority of students in primary and secondary education to achieve satisfactory levels of learning in language arts and math, according to the standards and tests set by an independent review body" (Fernandez, 2011).

Given the poor performance of students in the first standardized tests in Mexico, authorities pledged to establish, since 2002, mechanisms for reliable, independent educational evaluation, with clear information on the results, according to the target of obtain satisfactory levels in both language and mathematics in primary and secondary students. Ultimately, the results of the evaluations serve to define and guide public policies in the sector and as a window within the education system, so that citizens can demand accountability from their results (Niebla, 1992).

Regardless of cases of failure and there has been little success in implementing standardized assessments, standardized tests have been used to assess the state and national educational systems; also they measure only certain domains of students. This type of standardized tests serve some individual characteristics of students because its construction is for different purposes; they are not for the purpose of measuring the achievement of each student in the classroom in each of the subjects received.

In addition to this, one of the main problems of a teacher of high school level is the lack of time to assess achievement levels acquired by students in each period. The use of web technologies are very useful, but be careful because not all available tools are tailored to the needs of the teacher because some are rigid and overly complicated to use.

Proposed solution

If the teacher makes a continuous assessment of student achievement level will be much better, therefore, the development of a so-called "Evaluate-t" Web System for test development and evaluation of middle level students aims higher .

The main advantage of this web system will test development by teachers, as it is they have done over the years, a pen and paper so to speak. The main thing is to take care that can not drastically change the way you prepare the exams, but remains as close to the current.

The main purpose of this system is to serve as a tool to teachers from high school in the development of tests to instantly assess the knowledge acquired in the classroom.

The assessment may have the characteristics of a standard type which guarantees the reliability and validity of measurement, generating as a result transparent information on the results obtained. The system will perform this measurement independent, single and automatic mode, allowing the student to know the degree of progress obtained in each subject in each subject; similarly, the teacher will be aware in real time the level of achievement that presents each of its students, allowing individual and impartial evaluation by a selection algorithm questions from a repository.

As already mentioned, the system should be as close as possible to the way teachers are now developing their exams; therefore, to have all the opportunities they have to create tests in a word processor, it requires a web system that allows them to ask different types of questions, as they could be alternative (true and false), multiple choice , relationships, complementation, identification (giving the possibility to insert images for each question), and so on.

As for promoting diversity in learning, such systems not only evaluate or produce information to quantify learning, but become attractive alternatives for the construction of knowledge, since, by variants of application, a test may become a learning mechanism.

Justification

Today it is known that most teachers from primary, secondary, high school and even undergraduate level continue to use the application of tests as the primary method for evaluating the knowledge gained by the student. It is known that one of the main problems of teachers at any level is the lack of time for qualifying exams applied.

Tests or examinations have been studied over time, especially by the Pedagogical Psycho. This is not intended as a text reproducing said by that area of knowledge and more to address the issue. However, it is a fact that no matter what goals are tests require time and accurate knowledge for their development and for their subsequent review and rating. With the implementation of various public policies around the mass of the groups to which tests are given, it is intended that the processing of the results in these instruments is fast and reliable, since the manual review takes (and still does) a huge amount of time for those engaged in this activity, which leads to errors due to pressure, fatigue and anger generated by the constant and unnecessary repetition of a mechanical action. A first step that was taken to temper those harmful effects optical sheets was used in the application of mass screening. This required first to use computer technology.

Repetitive, mechanical and therefore unproductive actions, can make a device designed expressly for example, the computer and the human can focus on creativity, innovation, and specifically in the area of education, to address various problems that affect the achievement of learning, such as knowledge of the students and their conditions of life and study, and increase their human capital. If you can engage in ongoing training, as well as updating their profession and everything that has to do with his life, including entertainment and fun, improve their quality of life.

Today many teachers from high school are still evaluating their students by printing tests for later review over 1000 tests per semester, having to deliver results to their students and the institutions themselves in the shortest time possible.

The method is not critical to do so, as in this study it is believed that the application of student testing is and will remain, although not the only, the best method to measure knowledge of a student. Likewise, it is believed that teachers should be the principal authors of the creation of such reviews. The web offers advantages over traditional written tests, which use too much paper and ink for playback; Additional automatic evaluation saves time and effort for teachers, because they invest too much time in reviewing the tests applied to students.

There are numerous web development systems for testing, but not all are easy to use, nor do they have standardized features for application type. Therefore, the implementation of a Web system that simply and easily can be used by teachers from high school to prepare for exams with standardized testing features such class or classroom use, allow also proposes evaluation using a selection algorithm questions from a repository.

This tool will help teachers develop senior high multiple-choice tests for the purpose of assessing the knowledge acquired by students in their classrooms. Evaluations may have the characteristics of a type standardized to ensure reliability and validity of measurement mechanisms of reliable and unbiased educational evaluation, with clear information on the

results. This measurement will automatically by the system, allowing the teacher to present the results at the time he decides.

The current advances in web technologies allow flexibility to develop a system easy to use for teachers from high school that meets the need for standardized exams with features and impartially perform the assessment, safely and immediately, thereby allowing timely detection of individual deficiencies which must immediately work with each student.

Hypothesis

The time invested in qualifying written exams by teachers is excessive, besides not being able to know in a timely manner the result of knowledge acquired by the people tested. Therefore, it is believed that the development of a web system for the development and evaluation of tests, and allows delivery of results in real time, will bring about an improvement in the quality of learning because teachers make the necessary adjustments when you see shortcomings in the student.

General purpose

The overall objective of this research is to develop a web system for developing standardized exams characteristics and evaluation of senior high students with reliable, immediate and individual measurements.

Specific objectives

The specific objectives to achieve are:
- o Define the methodology for the development of the proposed system.
- o Specify the conceptual model of the system.
- o Develop the architectural design of the system.
- o Program modules and system components.
- o Implement a web user interface.
- o Make perform system tests.

o   Implement the system.

Conceptual model

The proposed system is presented by the following scheme (Figure 1).
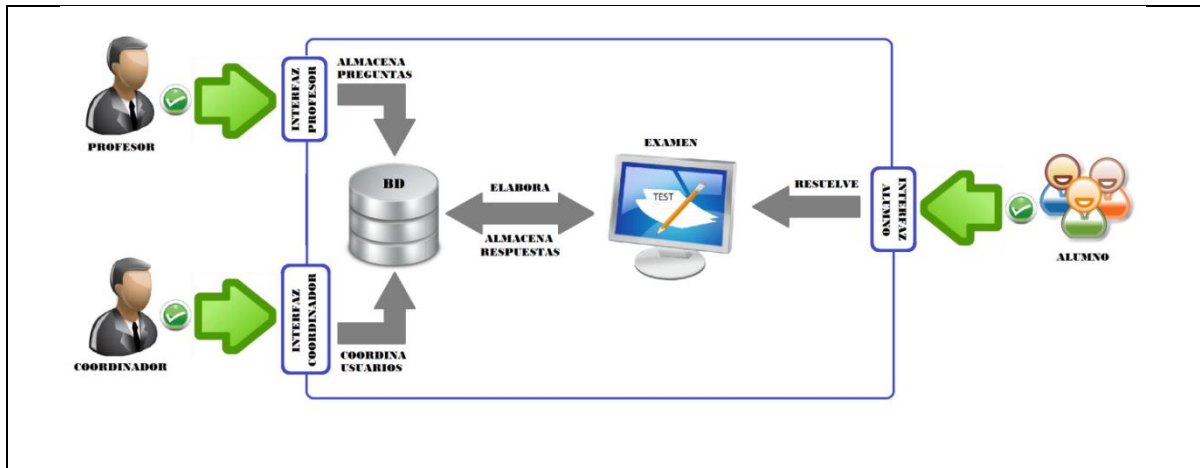
Figura 1. Modelo conceptual del sistema.

The teacher has the most robust interface, as among many other tools is not mentioned in the interface where teachers create tests, examinations publish, review the qualifications and downloading them.

The student interface is simpler, because its use requires only taking a basic computer course, and today many young people do not need or have taken such a course to use a computer in a basic way. At the same time, this interface is the most important, because although this system was specially created as a tool for creating exams by teachers in this interface of students these examinations are answered, so the information here is collected which will help decision-making by teachers.

User coordinator is responsible for the capture in the system of teachers, students, groups, materials, and making the relationship of all these so that each user has access to the system and to display the different privileges are there because a user either teacher or student user.

Results

The "Evaluate-t" system developed in this research refers to the type of test class or classroom use offers the following advantages: standardized type tests made independent (each school sets its own criteria for use) Closed questions with multiple choice and one answer for each question; the evaluation is objective leaving out the subjectivity of the evaluator, it is also fair, because all those tested are in the same conditions nobody has advantages over others, is individual because the system evaluates personally to each student, the results are confidential (only sustaining the institution and the known). The rating is systematically minimizing errors and allowing sustentantes handle large volumes.

The web system created, better known as Evalua-t, and now found online at http://evalua-t.com.mx/ page presents the interface for creating tests as follows:

Module: creation of exams

User: Professor

Picture: test creation process (Figure 2)

Figure 2. The process of creating exams.

One of the main things to look at creating an evaluation system for upper secondary levels, is simplicity and ease of use and design in the creation of tests. As we know many of the teachers who currently work in these levels of education, they create their exams to evaluate students through word processing, creating multiple-choice tests.

As we can see in the picture above, the method of creating tests using this new system tries to give the teacher a clear idea of the ease with which you can create multiple-choice tests, mainly entering the question, entering the possible answers button and selecting the correct multiple choice answer.

In Figure 3 we see the same process of creating exams, but using different tools with counting system; some of these tools offer the possibility to enter questions with images, select the level of the question to enter, enter text tool start of the test, the selection of the subsidiary question of the original text, the option to automatically add questions and whether existing bank questions in the database system or add power through Excel files, the ability to add or reduce the number of responses, among other tools. With the images of Figures 2 and 3 we can see that the system can be used by any teacher as it is provided in the form of the creation of simple tests, entering only the questions and answers, but also lets you use different tools to create a more thorough examination.
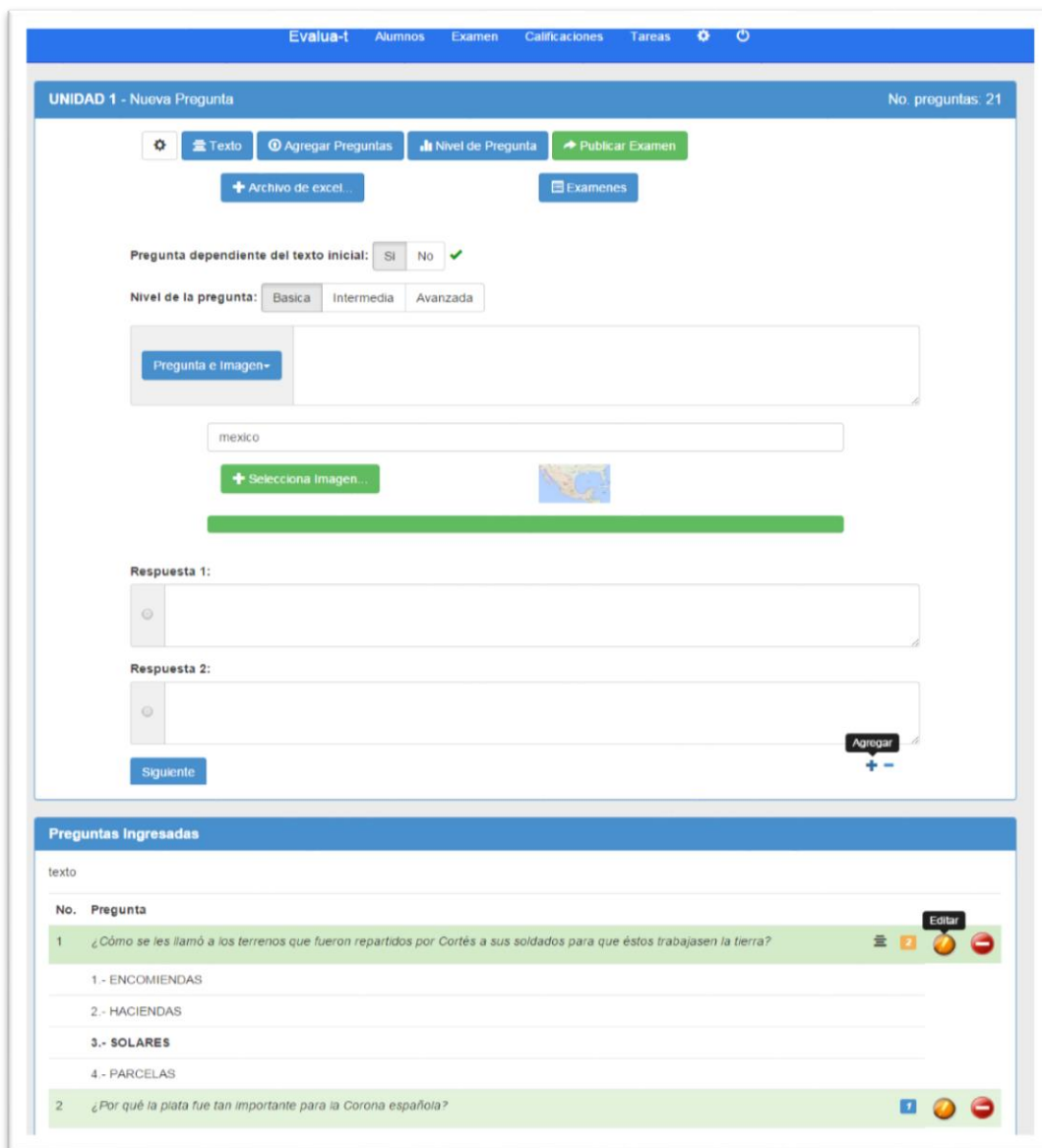
Figure 3. Questions with pictures.

Types of questions

Something that can also be seen in the inclusion of multiple choice questions (Figure 6), you do not necessarily have to be this kind of question, since in these same questions can include relationship (Figure 4), complementation (Figure 5), true and false questions (Figure 7), identification (Figure 8), and so on.

An example of how it can include different types of questions in this web system is shown.

Questions regarding:

Figure 4. Questions of relationship.

Complementation questions

Figure 5. Questions complementation.

Multiple choice questions:

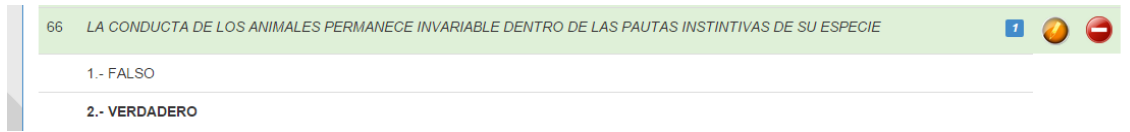**Figure 6. Multiple choice questions.**

True or false questions:

Figure 7. True or False Questions.

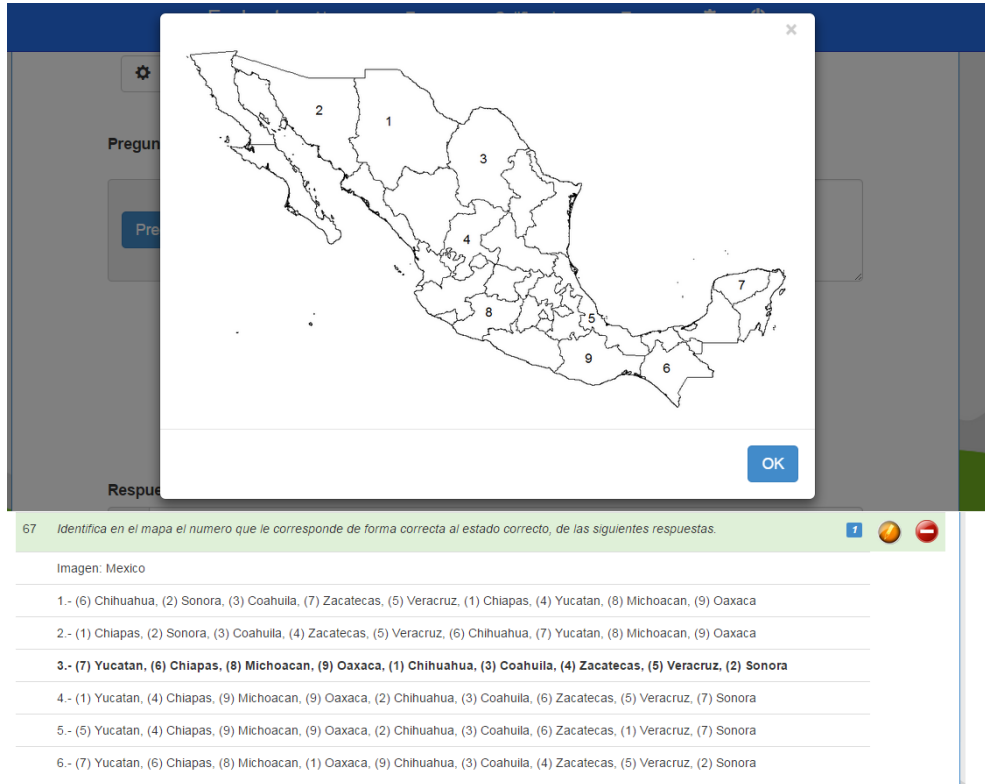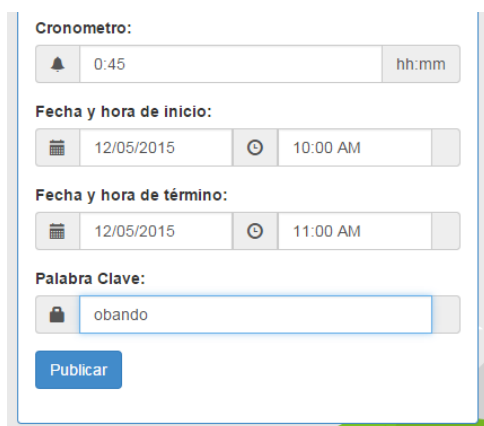Identification questions:

Figure 8. Identification Questions.

Following the creation of the test, the same is published for students to evaluate, like daily teachers do these levels, where they are given a date and time to start and end in which students can do examination (which is usually when class with the teacher in particular group), as well as a specified time to perform the examination and also a key for the exam only in the classroom where the teacher is found word. Likewise, this system can be applied or not these same restrictions, publishing this same test for different groups where the teacher teaches the art to which the test belongs created.

Its publishing process is easy, which we see in the following image taken web system created.

Figure 9. Publication of the review.

Measurements made regarding the level of satisfaction when using the "Evaluate-t" Web system as a tool for test development and its application to students at the high school level, 95% cover their expectations thanks to the facility creating and testing different tools and options offered by the computer system to create a new test. Internet technology is attractive to students, and indirectly contributes to reducing the consumption of paper, ink or toner as it dispenses with the photocopying of tests, significantly reducing production costs.

During the research on the development of a good information system covering the main needs raised here, he concluded that a system that is on the web is the best option, since this type of system requires no install any specific software on computers where they are going to take exams; just a browser, which is already included in the operating systems is required. Similarly, and for the above stated reason for creating this web system we decided to use as the familiar programming language PHP (Hypertext Pre-processor). The field of education is very broad, so that in the future this web system could improve in many aspects. That was how it was determined to find a framework that would enable the expansion of the system so far created, and use Codeigniter for their great advantage to separate the model, view and controller. Figure 13 shows a small part of the programming code web made in this system.

```
{ 115      function insertar(){
  116          $this->form_validation->set_rules('nombre', '', 'trim|alpha_numeric_space|min_length[2]|max_length
                  [20]|required');
  117          if ($this->form_validation->run()==FALSE){
  118              $error=$this->form_validation->error_array();
  119              if (array_key_exists('nombre', $error)) echo 11;
  120          }
  121          else{
  122              if ($dat=$this->mexamen->setExamen($this->input->post("prof_mat"),$this->input->post("nombre")
                      ,$this->input->post("id")))
  123                  echo $dat;
  124              else
  125                  echo 0;
  126          }
}127      }
```

Figure 10. Part of the system code.

Conclusions

This system does not seek to change the way teachers assess, but it is they who primarily develop tests for their students. Using a system like this saves time teacher who can devote to evaluate exams and improve student knowledge by results that this system gives immediately.

While there are numerous evaluation systems, it is known that teachers do not use them because they are very ambitious, that is, cover and leave too many features to meet the main needs are required, especially in the high school.

The Evaluate-t system is an easy to use by teachers from high school to develop tests and assess the knowledge that students acquire in the classroom. This measurement has the characteristics of standardized tests, thus offering trust, transparency and impartiality in the results; Also, the rating is automatic and confidential.

Recommended

Evaluate the area of t-test system are created by teachers to measure knowledge. It is recommended to complement this tool with other instruments to measure skills, abilities and skills of the students, making the most complete and comprehensive evaluation.

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