

Web system of interviews for tutoring in high school

Sistema Web de encuestas para tutorías en Bachilleratos

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Abstract

Academic tutoring is one of the strategies implemented at different educational levels where students (tutors), teachers (tutors) and parents are involved, which aims to improve school performance, solve school problems and develop habits of study and work, contributing to the decrease in failure rates and school dropouts. Some techniques that help to identify if a student is going through difficult situations are interviews and tests that allow evaluating aptitudes, abilities and behaviors. That is why a web system is developed for the high school that allows supporting the different actors of the tutoring in storing and consulting the information provided, the system will be able to register users, subjects, groups, assign tutors, conduct interviews and tests, view the results obtained, write comments on students with school performance problems and allow reports on failure and dropout rates.

Resumen

La tutoría académica es una de las estrategias implementadas en diferentes niveles educativos en donde están involucrados los estudiantes (tutorados), docentes (tutores) y padres de familia, la cual tiene como objetivo el mejoramiento de rendimiento escolar, solucionar problemas escolares y desarrollar hábitos de estudio y trabajo, contribuyendo a la disminución de índices de reprobación y abandono escolar. Algunas técnicas que ayudan a identificar si algún estudiante pasa por situaciones complicadas son entrevistas y test que permiten evaluar aptitudes, habilidades y conductas. Es por ello que se desarrolla para el nivel medio superior, un sistema web que permita apoyar a los diferentes actores de la tutoría en almacenar y consultar la información proporcionada, el sistema será capaz de dar de alta a los usuarios, materias, grupos, asignar tutores, realizar entrevistas y test, ver los resultados obtenidos, escribir comentarios de sobre alumnos con problemas de rendimiento escolar y permitirá hacer los reportes sobre índices de reprobación y deserción.

School tutoring, School dropout, Web system

Tutoría escolar, Abandono escolar, Sistema web

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Introduction

The Mexican government, through the Subsecretaría de Educación Media Superior, since 2013 implemented the project called Movement against School Abandonment which, with the participation of different actors, look for reduce school desertion and increase access to Educación Media Superior (EMS) through different strategies such as tutoring.

The tutorials for the Mexican Institute of Industrial Property (2017) “improve the attitude and availability to learning due to the fact that an empathic act is generated when receiving or giving tutoring between peers, communication skills and personal development are improved and In addition, it encourages the active participation of the students involved in their own learning process. Six half-year of study at EMS, the manuals range from how to prevent the risks of school dropout to the participatory planning process for the plan against school dropout.

In the general high schools of the region of San Martín Texmelucan the program "I do not abandon" is carried out which, for (SEMS – Secretaría de Educación Media superior, by its acronym in Spanish) indicates that "The Movement against School Abandonment is a comprehensive national strategy that involves joint participation and coordinated by educational authorities, federal and state, school administrators, teachers, parents, students and society in general, to achieve higher rates of access, permanence and successful completion of upper secondary level studies."

This program makes use of the 12 manuals, within which there are tools that serve as support at work for tutors, such as formats, quiz and annexes to be answered by managers, teachers, students and parents.

Each manual has different tools that the tutors use in their tutored students, however, at the time of applying the interviews or tests a large number of copies must be generated and that causes the waste of paper, many times they tend to lose the applied tools and when information needs to be consulted, it is no longer available.

That is why it is necessary to develop an information system to support the processes and decision-making of the "I do not abandon" program, with this system times will be optimized in obtaining results, as well as avoiding loss of files, keeping track of the number of students who have had tools applied, generation of tutorial reports, as well as avoiding paper consumption.

With the system, the campus principal will be able to add teachers, students, parents, subjects, add students to their groups and subjects. The tutors will be able to carry out the interviews and tests requested by the group tutor, as well as view their results or print them. The group tutor will view and print the results of the tools applied to each of his tutors.

It is important to mention that the high-school who will use the system must prepare the personal data privacy notice in order to inform teachers, students and parents of the main characteristics of the treatment that will be given to the information obtained. The Instituto de Transparencia, Acceso a la Información Pública, Protección de Datos Personales y Rendición de Cuentas de la Ciudad de México (2021) says that at the medium security level "refers to the security measures required for those data systems related to the commission of administrative or criminal offenses, public finances, financial services, patrimonial data, as well as the systems that contain data with which it is possible to obtain an evaluation of personality or profiles of any kind in the present, past or future, " so the project will be supported by this level of security because it does personality evaluations or profiles of each student.

Methodology

There are different software development methodologies, which are classified in classic methodologies such as waterfall or spiral and in agile methodologies such as XP (eXtreme Programming) or SCRUM which allow to take control of the project, to carry out this project the SCRUM methodology was chosen in which “partial and regular deliveries of the final product are made, prioritized by the benefit they bring to the recipient of the project.

Therefore, Scrum is especially suitable for projects in complex environments, where you need to get results soon, where the requirements are changing or poorly defined, where innovation, competitiveness, flexibility and productivity are essential. each approach has its own steps” (Scrum n.d.). In general, to develop a software project it is necessary to go through different stages of software engineering: analysis, design, implementation and testing.

The first stage is of utmost importance because it is when the development team contacts customers and end users in order to obtain information from the system, this is called a obtaining requirements, the development team analyzes each of the requirements provided in order to decide the priority of its development. Rogger (2010) states: "In an ideal requirements engineering context, the conception, consultation, and elaboration tasks determine the customer's requirements in sufficient detail to advance to the next software engineering activities."

For this phase, he contacted the general high school "Professor Ignacia Islas" in the community of San Cristóbal Tepatlaxco, interviewing the director and the school tutor, who made known the processes and roles that are handled. The information that will be optimized will be on individualized attention, control of attendance at tutorials, fresh interview with the tutor and the parent, from manual 1 (Manual to prevent the risks of school dropout in upper secondary education).

The format for monitoring students at risk and the survey for detecting coexistence problems will be digitized, from manual 2 (Manual to receive new students in high school schools), the annexed personal and academic profile questionnaire is considered for manual 3 (Manual to promote better study habits in high school schools) the test will be placed to detect study habits and learning styles.

The classroom and life train functioning tests are taken from manual 7: "Manual to support educational guidance in upper secondary schools". From manual 9: "Manual to be a better tutor in upper secondary education schools" the test of knowing learning styles is extracted, finally, from manual number 11: "Manual for the development of socio-emotional skills in EMS schools".

The questionnaires in annexes 1: levels of empathy, 2: attributions and 4: type of mentality will be implemented.

In addition to these manuals, it is important to keep track of teachers in front of the group, the positions that teachers have (teacher, tutor, school tutor and director), the tutors of each group, the subjects, parents, students, groups , surveys and of course, update the personal data of each teacher and student, send the password by email of a user who has forgotten, upload images such as the CURP(Unique Population Registry Code for its acronym in Spanish) , INE (National Electoral Institute for its acronym in Spanish), domiciliary receipt or any other document that is requested to the family guy. For this reason, not only will a system be developed that has the information on the results of each applied tool, but also the general information that is requested in the tutoring program.

For the development of the software, different programming languages and database managers were analyzed to facilitate its implementation, among which php, asp and jsp had been chosen with the My SQL, Sql Server and PostgreSQL databases, reaching the conclusion that php would be the best option with the Laravel framework, which “is an outstanding member of a new generation of web frameworks. It is one of the most popular php frameworks and it is also free and open source. " (Nutile. 2016) and as a My SQL database manager.

For Glajumedia (2020), “Java and PHP have strong benefits and support for the world's leading companies and the largest websites. Java has strong security and an easy connection to third-party APIs, making it much better for complex projects such as banking or supply chain industries. On the other hand, PHP is a fast and low-cost language solution for e-commerce and retail sales.” This project does not require large transactions or connect with other APIs, that was one of the main reasons for choosing php.

Another reason why these tools were chosen is that when the project is hosted on the server, it is easier to find servers that support php and MySQL than the other tools, even if they are paid. Compared to asp.net, php is a free programming language that does not need to pay for a license to use it, just as there are different free IDEs (Integrated Development Environment) to implement the web application. SublimeText will be used in the coding of the project.

After having carried out the analysis and modeling of each of the system requirements, the design stage continues and Rogger (2010) indicates that "Software design groups together the set of principles, concepts and practices that lead to the development of a high quality system or product." However, in this second phase, some analysed data were improved, such as the way to store the information, the data that is requested from students or parents. It is important to mention that a good analysis and a good design lead to the development of the system with lower costs.

For the design phase, CASE tools (Computer Aided Software Engineering) were used to generate diagrams of sequences, status, database model and low resolution screens. The tools used in this phase were DIA, SQL Power Architect and Balsamiq Mockups. Figure 1.1 shows part of the database model.

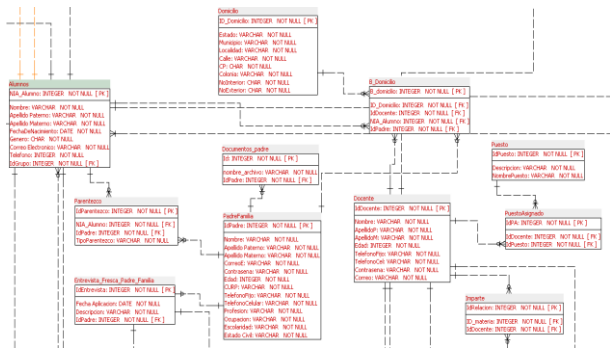


Figure 1 Database model
Source: Own elaboration

In the third phase, which is the implementation, several iterations were carried out and some of them are briefly described below.

First iteration: main screen where you will have different components (buttons) for addressing screens, as well as a style of striking colors. Once analysing the representative colors within the application and the knowledge about HTML coding. The result of the main screen is shown below in figure 2



Figure 2 Main screen
Source: Own elaboration

Second iteration: generation of PDF files in specific reports and surveys, such as: tutorials report, individual report, failed students, etc. Once the student has answered a survey or test format, the file with a pdf extension can be generated in the browser, so that it can be downloaded and subsequently printed as many times as necessary. Figure 3 shows an example of the responses to a survey conducted on a student.

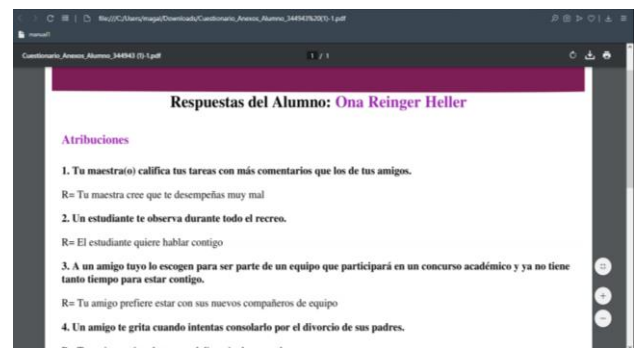


Figure 3 pdf's report format
Source: Own elaboration

Third iteration: From manual number 1, the follow-up format for at-risk students was digitized, allowing the director to closely monitor the student and establish fluid communication with the team that will provide direct support. It will be relevant that quantitative and qualitative information on the student's performance be included in the monitoring documentation. Figure 4 shows the digital format.

Figure 4 Monitoring of students at risk
Source: Own elaboration

Fourth iteration: a form is filled out for the detection of tutors who require individualized attention, in this format 4 factors are measured with their respective particular situations, the factors to be analysed are: health and weight, academic, psychosocial and family. Presence of visual and hearing impairment, lack of study techniques, depressive problems and family violence, are just some of the situations that occur in the different factors. Figure 5 shows the screen of this digitized format.

Figure 5 Individualized attention format
Source: Own elaboration

Fifth iteration: control of attendance at tutorials, this is filled out only when the tutored has an interview with his tutor, the tutor can carry out individual or group interviews, in case the interview is group, he must fill out the form for each student attended. In figure 6 you can see the high-fidelity screen of the attendance list.

#	Nombre del alumno	Solución	Caso o situación atendida	Indicaciones posteriores	Opciones
1	Magaly	solucion 1	caso 1	INDICACIONES 1	[Icons]
2	r1	i3	i2	i4	[Icons]

Figure 6 Attendance list
Source: Own elaboration

Results and discussion

Results obtained when implementing the web system have been satisfactory for a high school in which the system has been implemented since at the time of using it, immediate response times were obtained from the questionnaires or interviews carried out with students, as well as the control of Students who have responded to each interview are controlled by tutored groups by the group tutor. Additionally, paper consumption has been reduced since now everything is carried out in digital, allowing almost instantaneous consultation of the information collected, since previously to consult certain information, the times exceeded 20 or 30 minutes in searching each student file. This system can be implemented in other state high schools that have the same tutoring program.

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Conclusions

The web system allows managing the information obtained from students, teachers, parents, subjects, groups, homes, positions and supporting the tutorial work by following up on the "fresh interview" by the high school "Prof. Ignacia Islas" and “Yo no abandono” program to reduce school dropouts.

There are other tools that are handled in the tutoring area that could be implemented in the web system such as the UNEME CAPA module which allows surveys on possible addictions such as alcoholism and drug addiction, however this module has to be worked hand in hand with the CORDE (Regional Educational Coordination) of each school section.

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