Web-Application for Managing Independent form of Education in Schools

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ABSTRACT

The document goes through the development of an online application, which aims to digitalize the control of the workflow in the independent education system in schools. In last years more parts of the normal education in schools is being digitalized - from current information about each student, grades, feedback, homework, projects to generating documents, however in the same time students in the independent form of education (IFE) still need to go to school for different information regarding their education and showing for consultations with the evaluating teacher and attend written or oral exam. This shows the need for creating a solution for managing this type of education.
<u>*Keywords*</u>*: student, teacher, administrator, school, platform.*

INTRODUCTION

The independent form of education includes independent studying and exams for determining annual assessments in the subjects of the school curriculum. Studying in this form requires different types of communication of the student with the institution or with teachers and tutors. The creation of an online application aims to facilitate the process of communication, tracking information and its easy management, both for students in IFE and for the institution. The platform allows it to be accessed in three different roles – administrator, teacher and student. Each of these roles has different functionalities, depending on the functions and duties of each participant in the learning process. With this, student-administrator-teacher-student communication is carried out quickly and conveniently with maximum functionality and achieving high quality of the process.

EXPERIMENTAL

The article is based on a study of the existing problems with the teaching of students in the IFE in the "Prof. d-r Assen Zlatarov" Vocational School, search for existing similar solutions and program development of a platform with the Visual Studio Code editor [1].

The independent form includes independent teaching and exams for determining annual

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assessments in the school curriculum. In independent form can be signed:
- Students of compulsory school age;
- At the request of the student or parent;
- Gifted students;
- People over 16 years of age who, for one reason or another, have interrupted their education and wish to continue it;
- When imposing punishment on students.

In the case of an IFE, an active school curriculum for a daily form is applied. Teachers prepare syllabus, exam papers or tests and assessment criteria for the relevant subjects. The exams in the school curriculum are organized in sessions, the number of which during the school year is determined in the rules of procedure of the school. There are 4 sessions in the school year in the schools in Bulgaria.

The IFE has always burdened the administration and teachers with additional commitments. First, the student often forgets what exams he has passed and what else he has to sit, also misses and applies for what exams he will take in the upcoming session, misses dates and times. On the other hand, teachers due to their high workload are often informed at the last moment about the upcoming exams. Many students do not know which teacher is responsible for their exam and find it difficult to find information and contact with them. All this is burdensome and causes a lot of negative emotions in all participating sides. The currently available online platforms have many functionalities for keeping an electronic diary with the current tests and is not well structured for independent students. In the conducted survey with teachers and administration, 95 % of them believe that it would be much more convenient and burdenless to have a separate platform where information about all activities and communications for this type of students would be located.

All this proves that there is a need to prepare a digital solution to the problems with the education of students in independent form.

Enrolment in this type of education is done by submitting an application in person at school, due to the various possible reasons for entering this form of education, it is necessary to fill in personal data, check documents for completed class, etc.

The platform created covers all processes that are carried out after the student's enrolment in the independent form. After submitting an application, the administrator registers the student in the platform. The student logs in after registration. Personal data is filled in and in case of a match with the data entered by the administrator, the student gets access to the platform. After registration, its information is uploaded into the database, which is built with MySQL [2]. The whole database schema is presented in Figure 1. Registered users based on their role are included in the administrator, teacher or student table. Upon registration, depending on the previously submitted information by the student as a name, surname, specialty and PIN, the registered person receives a role – a student or a teacher. The user can then enter the platform through the login form. It requires you to enter the user's email and password. When entering the input information, a validation of the data is made.

Role "Administrator"

The administrator does not register, he receives his login details from the provider and the owner of the platform. In the home page, which opens, there are several menus – for entering the student's data, for submitted applications, for adding exams, for publishing the results and for taking out a report. The administrator control panel is shown in Figure 1. The admin panel allows to enter all the data of the student immediately after submitting an application for enrollment. At the beginning of the school year sets the deadlines for submitting the applications for the respective exams for relevant sessions. The Administrator receives all the online submitted exam application forms

in the platform for attending the examination session's throughout the whole school year. The Administrator assigns all the exams of the student according to the curriculum, divided into classes for the entire course of study. Uploads the schedule to the platform. At the same time, the information about the exams is visible in the platform for each student and respectively for each teacher responsible for his teaching. The exam is assigned using a ready-made form. There are several fields that we need to fill in for the appointment of an exam. Here, the specific thing is that the information about the fields for selecting a session, subject, student's name, surname and teacher's name and surname is extracted from the database in drop-down menus, but the date of the exam has to be typed in. The specific thing here is that a student cannot have the same exam assigned on different dates, as well as several different exams in one day.

The Administrator has many responsibilities to the students and to the teachers, because he is responsible for corresponding and accurate results from the exams. He obliged to create a report with the exam results for each student for each session and must decide if the student has passed the corresponding class. Finally, he has to fill in the results in the personal evaluation card from the education.

Role "Teacher"

The teacher has an official registration provided by the administrator and he uses it to login the platform. Once a teacher has logged in, a panel will open showing whether there are upcoming exams, which student is attending the exam, which class and in what subject. He will be able to check the exam date, the grade and session, which the student is attending. He is responsible to check the exam and submit a grade for the predefined data about the exam. He can choose a status and a grade. He can make contact with the student and they can negotiate online or face-to-face consultations if necessary. If we try to re-evaluate the same exam for the given student and a subject the option to evaluate the exam will be removed completely as an option and the new status will be updated. The teacher control panel is shown in Fig. 2. Only after entering a score for the exam can, we see the results for a given student.
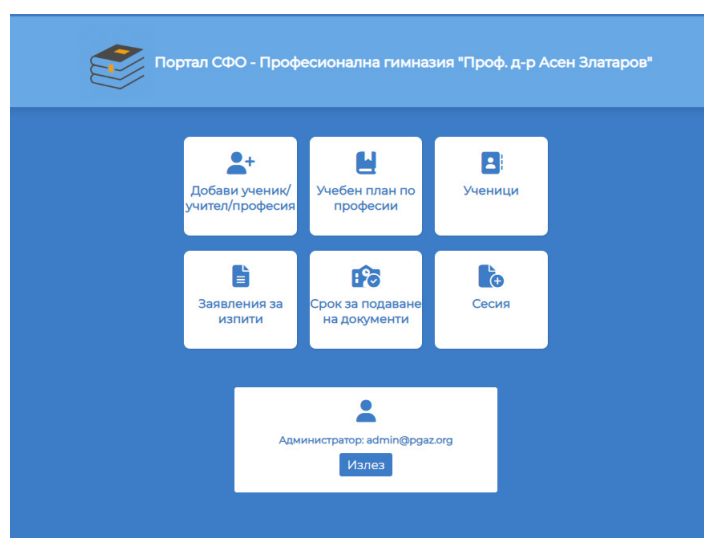

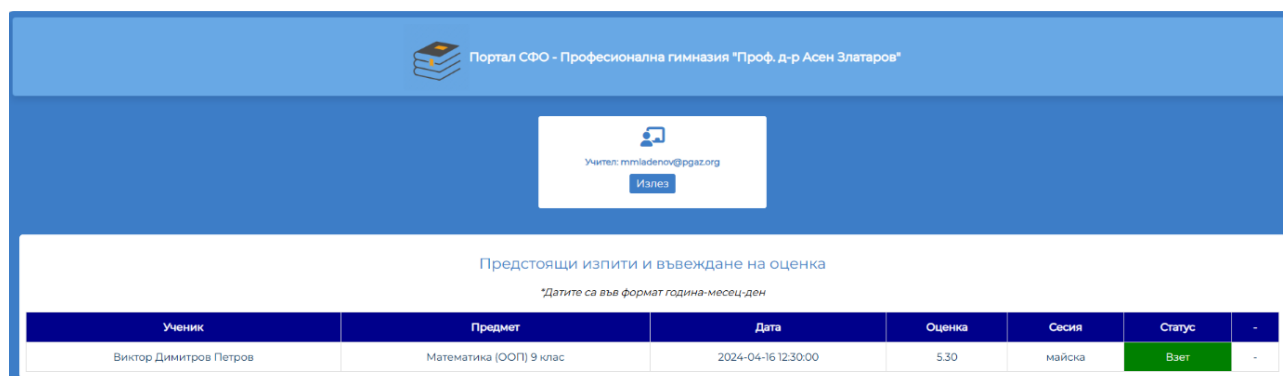
Fig. 1. Administrator control panel.

Fig. 2. Teacher control panel.

The results of the exams are visualized in the list of subjects entered by the administrator when the student is enrolled, so all subjects and grades are visible to the student and the administrator, and for the teacher which only he has evaluated.

Role "Student"

After he has registered with his own personal number and he has submitted his application, he is able to login the platform and check his status. In the home panel he can see the reminder of the deadline for the submission of the application forms for each exam. The student home panel is shown in Fig. 3. He can see his name and choose the session he wants to attend and the subjects, up to twelve at a session, to sit for. This is done from the menu. The student will be able to choose only from exams in which there is no assessment. The student will not be able to choose from upper class exams until there are marks from all exams in the previous class. He will receive regular notifications by email within the deadline, so he does not miss it. After the deadline has passed the application form will not be active anymore.

In the assigned syllabus and exams menu the student can check all the subjects for all the school years and the status of each subject (passed, failed, upcoming, not evaluated yet). The assigned syllabus and exams panel is shown in Fig. 4. He can see if the status has changed, his grade and the still remaining subjects.

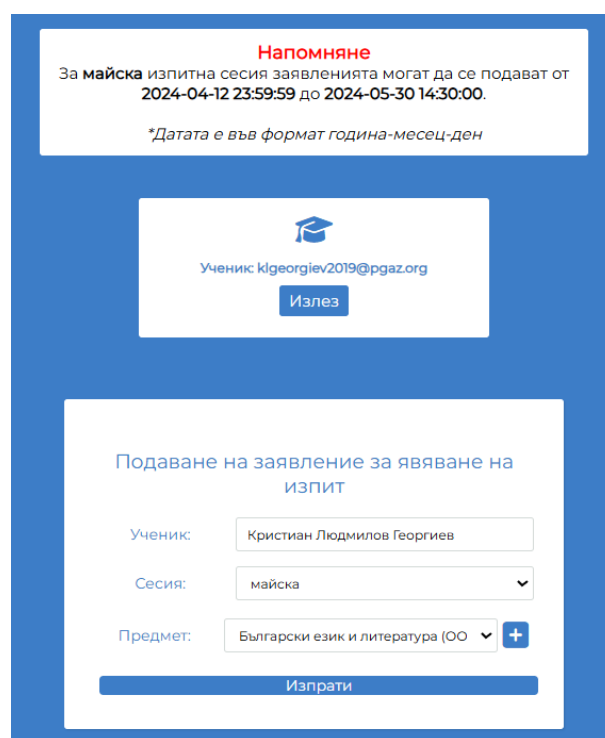In the assigned exams menu, the student will

Fig. 3. Student home panel.

be able to find out what exams are coming and on what date and who is the examiner with contact details by email.

Relational database

The database of the web-application consists of 9 tables. Each one of them can be seen on Fig. 5. The information about the administrators of the platform is saved in the administrators table. It does not have a relation to the others, because

Fig. 4. Assigned syllabus and exams panel.

Fig. 5. Database of the web-application.

the data of the administrators needs to be kept separately (only the owner of the application enters the data for each admin in the school).

There are separate tables for the data of the students and the teachers. We need to store different fields for them. The students need to

have a profession, so we have a table that stores each profession and the class of that profession. The subject's table is connected to professions, because one profession has many subjects in its curriculum.

The teachers can have many exams on

different subjects with a lot of students. In this case there needs to be a many-to-many relationship between multiple tables. That's why the junction table student_teacher_subject combines the primary keys of the tables - student, teacher and subjects.

The last table sessions hold the data for the deadline for applying to different exams. It is connected to exams, because one session can have many exams.

RESULTS AND DISCUSSIONS

The application was given to my IT teacher for testing and evaluation. The test consisted of:

- Providing the application
- Registering the teacher as an admin
- Giving him the account information
- Registration of the teacher on the platform
- Registration of student's accounts
- Receiving application forms from the students
- Checking the applications and assigning the corresponding exams
- Assigning date and teacher to evaluate
- The evaluation teacher checks his exams and submits a grade
- The student can see his result and subject status
- The administrator submitted a results report

There was a discussion for the benefits and the drawbacks of the platform with representative of the Shkolo platform which is a major electronic education platform provider of electronic school registers in Bulgaria.

The design and the future improvements and the implementation were discussed.

We paid more attention to the possible implementation of the developed software solution. Recently, the Ministry of Education and Science in our country aims to impose a common platform to reduce the need for the use of multiple educational platforms. In addition, it aims to reduce the creation of many accounts that teachers have to use. The result is that such an application is necessary addition to every school which has a lot IFE students.

CONCLUSIONS

The web-application covers all activities and interactions between student - administrator - teacher in IFE. This facilitates and supports both the work of the institution and the calm and seamless teaching of students who are not in school, and in many cases even in another city or country. The lack of transparent and clear communication often leads to dropping out of the educational system, which after 16 years is not mandatory, but is an advantage for starting work.

The web application could be used on its own, as a separate application for IFE or implemented in ready-made platforms in the education system. To improve the organization of the programming code and the web pages of the platform, some of the finished templates will need to be used. This will help implement future changes and update functionality if necessary. Such software solutions are unique because they solve a specific problem in a particular niche, in this case - digitalization of the independent form of education.

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