MANAGEMENT IN INCREASING THE PERFORMANCE OF THE SOFTWARE APPLICATION FOR ELECTRONIC TESTING OF THE STATE HIGH SCHOOL IN KOSOVO THROUGH MODERN TECHNIQUES

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Abstract: While the process of shifting learning to distance or online format, has already become part of many educational institutions in different parts of the world where COVID-19 also had a major impact.

There have been ongoing efforts to reform teaching, learning and assessment methods in our country. Formative assessment occupies an important place in all stages of student development, from pre-school to university.

This paper will address the increase and management of software application performance using modern technologies WCF (Windows Communication Foundation), Web services and comparison of these two technologies for the management of state high school testing in Kosovo (E-High school).

computer networks are included everywhere, the internet is one of the most widespread network among many systems such as mobile telephony networks, enterprises, home networks, etc. All of these networks share common features which make the use of remote technologies utilizing this infrastructure important. However, since the Internet is not a secure medium, care must be taken as to what technology should be used to exchange data securely.

Nowadays it is impossible to imagine managing and running an institution without the application of software applications that offer better and faster solutions than the manual work done by man himself. Web methods will be created using these two technologies, where as a case study for extracting the results will be used the software application for testing students in the state high school in high schools in Kosovo and the connection of this application with the electronic work management system with student (SEMS) at the University of Pristina. The use of WCF and Web services is intended to realize the advantages that are offered and practiced in different systems during the realization of communication between software applications. ICT has had an extension in its use, gradually over time until the twentieth century XX, but its beginnings that have become an integral part of the teaching process were from the beginning of the century. XXI. ICT is understood as an implementation of technological equipment and tools in the learning process to record and process information in digital form.

Keywords: WCF, Web services, E-high school, SEMS, Software applications.

1. INTRODUCTION

For years, it has been discussed about the impact that informatics has and can have, that is, IT, in the school system, at all its levels. This has enabled, especially in recent years with the development of the web, a transformative movement in education, especially in developed countries.

Although the shift to online learning has now become part of many educational systems in the world, the level of use and the way technology is used to achieve the quality of distance or online learning is considered to be variable, and depends on Numerous factors, related to the various parties involved in the realization of this learning format and the integration of technology in education systems before the period of taking measures for school closures as a result of the Covid-19 pandemic. The use of technology to keep education systems functional in different parts of the world, due to the isolation of the population, was considered the most appropriate and only alternative in this period.

However, the need to shift teaching to distance or online format has also been assessed as an advantage. The opportunity to achieve developments in the field of digital education, which in other circumstances would take years, is considered one of the advantages of shifting learning to the online format (Lurvnik, 2020). Shifting learning to this format has also been assessed as a good opportunity for teachers and students to empower themselves, become more creative and innovative (Yokozeki, 2020).

So, the evaluation of students as the main characteristic has the development of intellectual, communication skills and depends on what emotional state the student is in. All of these competencies contain a summary of integrated knowledge, skills and habits that can be applied and transferred to students in order to meet the challenges of contemporary life and learning, which is the time of digitalization in the 21st century. to.

Also, the success of the implementation of distance learning and assessment or online, as well as the successful management of change, has been proven to be influenced by the way instructions are provided and the level of their

explanation, access and appropriateness of technological equipment, time, motivation and support to participate in online learning (Ibrahim, Kaabi, Zaatari, 2013).

State high school testing in high schools is a sensitive point at which improvements can be made using technology. This paper deals with the provision of solutions of higher performance applications for the state high school test (E-Matura)[8] in high schools in Kosovo using the technology of Web services and WCF services.

2. MATERIALS AND METHODS

Distributed technologies have undergone a continuous evolution in improving the experience of developers and users regarding response time, the performance of an application product, and the development and management of systems to ensure successful and reliable implementation.

The paper aims to integrate the technical components of Web services, WCF services and Ajax which are among the most modern techniques by which applications in the form of high-performance windows and Web are developed. The main strength of the Ajax technique thanks to the asynchronous nature of calling is the creation of highly interactive web applications that compete with desktop applications.

Using these technologies, we offer solutions for the systems that manage the State High school Test (E-high school) of Kosovo, as well as the interconnection of this application with the electronic system of student affairs management (SEMS) at the University of Prishtina.

Fig.1 E-high school architecture
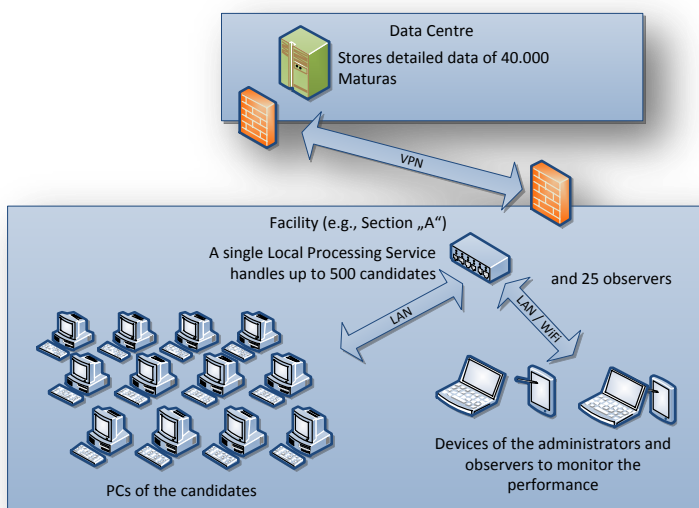
The client layer contains the interface that allows users to communicate with data interactively. In this layer, students access the application through PCs, connected to a LAN network in the testing center which can support up to 500 candidates.

Server layer, this layer is responsible for the requests made by the client through LPUs distributed by MEST, to perform the service with the database server and give results to the client. This server is accessed by students through computers connected to the LAN, also in this LPU (local Processor Unit) are accessed by the test administrators to activate the test wave and monitor the student computers.

Scientific methods have been applied: descriptions, analysis, synthesis, inductions, subtraction, critique, comparisons, causal methods, system approach method, statistical methods, predicted methods and modern operational research methods.

In this paper were used the scientific methods necessary for the analysis and synthesis of the selected problem, that is, the methods established in accordance with the subject matter, the problem, the purpose of the research, and the hypotheses set. Scientific methods were used: descriptors, analyzes, syntheses, inductions, deductions, critiques, comparisons, causal methods, systematic approaches, statistical methods, forecasting methods and modern methods of operational research. Exploratory research, in this paper, refers to the study of developing country practices and

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[8] E-Matura- Online Test for the state high school

professional work, with the aim of expanding knowledge in the field of management of state testing graduates. During the research surveys, local and foreign publications, statistics of the Ministry of Education of Kosovo, Statistics Agency of the Republic of Kosovo, Bit Kosovo, Municipal Education Departments, schools, University of Prishtina and other relevant data were used. Local and foreign institutions, in order to reflect better the phenomena. The empirical research strategy is based on a combination of qualitative and quantitative methods. The use of qualitative research enabled the data to be collected, that is, to obtain answers to defined research questions. The qualitative approach was applied to consider the views and opinions of the respondents in more detail.

For the realization of this research, the quasi-experimental method was used, in which two groups of students were included, the experimental group and the control group. As for measuring instruments, pre-test at the beginning of the research and pastest at the end of the research were used in both groups, in which an open observation and a questionnaire were performed.

The quasi-experimental method can be used in several situations, where two or more groups of students can be identified that are different, one can be used as a control group and the other as an experimental group (Vula, 2016). Experiments have two basic components:

• The experimental group is the group of students that manipulates or changes in some way.

• The control group is the group of students that are completely identical to the first group in all aspects, except the manipulated or altered aspect.

Information technologies offer many alternatives in the field of education and many software applications are being developed in this field. The education system in our country is generally in the reform phase and is constantly subject to the application and innovative use of information technology, but the methods of application of electronic testing are not yet clearly defined. Based on this data, we will propose a possible solution to this problem including the application of electronic testing, on the basis of which we will analyze and present the possibility of expanding its functionality to support the integration of this system. in the SEMS system environment.

3. RESULTS

Research the subject, and it was interesting to analyze the aforementioned factors and provide information on quality of service and educational outcomes, and thus deepen further studies of the research problem.

The main purpose of this paper is to present the theoretical and empirical findings from the research results, the application of management in contemporary conditions of educational development and its implications for the development of a higher quality assessment in pre-university education in Kosovo.

The research was conducted on a representative sample of students of all years of study at Regional High Schools. This election "quota" provided satisfactory representation, as well as a sufficient number of respondents to implement the envisaged statistical procedures. The sample included a total of 135 students, out of 1400 enrolled in the Regional High Schools.

To collect data on the attitudes and opinions of students of the Regional High Schools of the Republic of Kosovo, a research study procedure was chosen, within which a questionnaire for students was used.

The statistical group included students of years X, XI,XII of the Regional High Schools;

The research was conducted on teaching and educational bases (centers) in Mitrovica.

It will help to improve the work of educational institutions and a wide range of promotional tools that attract the attention and encourage potential students. While advertising presents the reasons and convinces potential users of educational services, the basis of this instrument is motivation for education.

From this research it was expected that in the classroom where online assessment strategies are used there will be an increase in students' interest in online assessment and will positively affect the measurement of their knowledge. No matter what the result will be in the end, students express their desire in the future to take the state high school test online (E-High school test).

In the paper test, ie the test that is currently being conducted at the national level by the Ministry of Education, we have a test which contains only one type of questions, so we have the question and we have 4 answers, one of which is correct, while the test E-high school we have 16 types of questions which we present in the following.

In the paper test the test result will be available from 1 to 2 weeks, while in the E-high school we will have the result immediately after the exam.

The assessment on paper is done manually, which means that each test sheet will be manually placed in the reader scanner of the answers, while the e-measured test will be displayed at the same time on the screens of the student monitor, for all graduates who have undergone the test.

In the paper test we have two different sets of exams, while e-measured each test is different we have questions that are generated randomly and not all students have the same test, the questions are generated by the bank of questions which are the same level. So during the drafting of the questions, the level of questions for each country is

determined, so that even the students who undergo the same exam are less likely to have two students with the same question. This method also significantly reduces the way students copy in the state matriculation exam.

E-high school software consists of Elements such as: Creating the exam, authorization wave, testing machine and the generator of results

The request creation element consists of the authors of the questions assigned by the MEST[9]-, quality assurance by the MEST, as well as the creation of exams is done by the course coordinators from the MEST, who are responsible for compiling questions from different subjects.

Sending the exam wave is authorized directly by the MEST, as well as sending the keys to activate the results.

The execution of the exam is done by the Test administrator, the Chairman of the commission as well as the IT expert.

This type of assessment is especially important because it is used to help students improve their performance in acquiring knowledge not only in the subject of ICT but in all other subjects. Technology has become an integral part of us, and very much accepted by students. According to the study findings, students possess sufficient technological equipment to attend online learning. The obtained results confirm the hypothesis presented at the beginning of the research. The research in question has observed the positive effect of formative assessment in addition to summative assessment.

4. DISCUSSIONS

According to the findings in this study, students consider distance learning and assessment as an advantage that enables them to be more flexible, they consider it as a process that will help students to be engaged and in the flow of lessons.

The findings of this study confirm the initiation and implementation of distance and online learning and demonstrate the efforts of teachers and students to be engaged in the learning process. It is also confirmed that students possess sufficient technological equipment, including smartphones, computers, laptops, iPads, which ensures them participation in online learning. This fact, in addition to facilitating the realization of online learning and the integration of technology in learning, also reconfirms the findings from studies conducted years ago through which it is emphasized that about 76.6% of citizens in Kosovo are Internet users and that families in Kosovo, regardless of income, residential area, level of education and other socio-economic factors, possess sufficient technological equipment (STIKK, 2013).

5. CONCLUSIONS

It is in the interest of everyone that each student in the test achieves a result that is reliable, objective and transparent that expresses the knowledge measured by that test. The use of these services also increases the performance of applications, in terms of management, security, transparency and reliability of applications.

To enable the successful achievement of online learning, from the perspective of online education organizations, the main factors are emphasized to be: reliable communication infrastructure, suitability of digital devices, appropriate teaching tools or materials, efficient learning methods, instructions clear from the organizational institutions of online learning, the effective support of the teacher and the student, and the close cooperation between the various actors involved in the realization of online learning (Huang, Liu, Tlili, Yang, Wang, .et al., 2020).

This application can be interconnected and function with the application of the electronic system of student affairs management (SEMS) at the University of Prishtina.

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