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Stakeholders' satisfaction from a new Management Information System to confront the phenomenon of student absences

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Abstract: *This paper proposes an Educational Management Information System (EMIS) that organizes all the administrative procedures with respect to monitoring school absences so that the related products have the same legal effect as the traditional procedures. The proposed EMIS covers the obligation of the Administration for complete, immediate and accurate information addressed to parents, reduces the operation cost of updating parents, removes workload from teachers, produces related documents with accuracy, provides the Administration with proper tools able to monitor student attendance and the tasks that the involved personnel has to accomplish. Based on the above-mentioned EMIS, we measure the satisfaction of all stakeholders, i.e., parents, teachers and executives using three types of questionnaires. Our results indicate that the proposed EMIS (a) satisfies the Administration's obligation for keeping the parents informed with thorough, immediate and accurate information, (b) reduces the operational cost of parental updates, and (c) reduces the workload of teachers. Future work is also proposed.*

Keywords: *school, secondary education, administrative procedures, student absences, attendance monitoring, administrative information system*

JEL Classification: *I18*

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1 INTRODUCTION

The phenomenon of school absence in Greek Secondary Education depends on many factors among which is the custody of parents and the students' belief that School cannot inform parents in time and accurately when students show up late or not at all. In addition, teenagers that make use of addictive substances report higher percentages of unexcused absences compared to those teenagers that do not make use of addictive substances (Sigala, M. & Christou, E., 2007; Kokkevi, A. et al. 2010). From the above, it can be deduced that, behind increased unexcused absences, may exist serious situations that a parent should be aware of.

On the other hand, the administrative procedures related to the need of monitoring absences are a laborious task for teachers. Furthermore, school administration has inherent difficulties in monitoring the application of the above mentioned procedures, in verifying the quality of the work produced by the teachers, in having easy access on primary

data related to absences and in being able to statistically analyze those data. Finally, the limited use of email technologies as a means for the School to communicate with parents in conjunction to the limited financial resources deter any effort of school administration to provide parents with satisfying updates regarding student absences (Christou, E. & Sigala, M., 2000, 2002; Agoritsa, M. & Vlahopoulos, D., 2015).

This paper proposes an Educational Management Information System (EMIS) that covers the obligation of the Administration to supply parents with complete, immediate and accurate information in a cost-effective manner, relieves workload from teachers, produces related documents with accuracy, and provides the Administration with proper tools able to monitor student attendance and the tasks that the involved personnel has to accomplish. Based on the above-mentioned EMIS, we measure the satisfaction of all stakeholders, i.e., parents, teachers and executives using three types of questionnaires.



2 THE APPLIED ADMINISTRATIVE PROCEDURE

The most important legislation that regulates all the aspects regarding student absences is the 10645/ΓΔ4/22-1-2018 Decision of the Greek Ministry of Education issued in January 2018. According to this legislation, a student's absences are noted during lesson time, from within the class, by the teacher, on a per-class basis, each class having its own absence book containing the absence signs for all students of the class. Since a student may attend different classes, his/her absence information is scattered to many absence books. Absence sign referring to the same students must be gathered from all classes which the student attends, summed up on a per-day basis, and uploaded to the Information System of the Greek Ministry called MySchool. MySchool must also be updated with all students' expulsions either these are hourly, or one-day or two-day ones.

Absence signs are noted on a special sheet referring to a specific class and date, called Daily Attendance Bulletin or DAB for short. This bulletin shows a table of rows and columns, each row referring to a student of a class and each column referring to one of the seven teaching hours of the daily timetable of Greek secondary schools. For each teaching hour, absence signs are noted and signed by the teacher. There is a variety of absence signs used by the teachers to indicate an unexcused absence, an hourly expulsion, a late arrival in class, etc. There is an upper threshold (typically 114 or 130) in a student's total number of absences, that, if exceeded, the student fails the class.

Additionally, there is also a wide range of absence types that do not affect the total number of absences and whether the student will fail the class. Such cases include the absences registered by students (a) for participating in official sports events, (b) for participating in school activities, (c) for presenting themselves to the Military Selection Board or in Court, (d) when exempted from attending specific lessons, (d) due to bad weather conditions that prevent students from getting to school, (e) when receiving special treatment or therapies for special medical conditions, etc. For all the above-mentioned cases, the student has to adduce proper documents.

School Units have to keep parents of non-adults informed about the total number of absences. In order to realize this obligation, parents sign a statement stating their email address and/or their mobile phone number as means of being contacted by the School. When a student reaches the lower limit of the total number of absences, that is 30, the School Unit has to inform their parents, via email or SMS, about the new total. The same obligation arises in the beginning and in the middle of every month, provided that there has been a change in the total number of absences since the previous update.

Hourly expulsions registered in class on DABs, also have to be registered in MySchool IS, otherwise the relating absences are considered to be invalid. Hourly expulsions have to be monitored so that, if the same teacher expulses the same student three times, the Class Board has to convene itself in order to handle the case. The same board has to be mobilized when the same student is expelled five times in total.

Finally, school administrations designate a teacher for each student class with the duty to monitor students' attendance,

summing up absence totals, utilizing information coming from external documents or from the MySchool Information System. These teachers are called theClassResponsibles(CR).

3 MOTIVATION

Two are the major categories of personnel that are involved with the daily administrative tasks regarding student absences: theClassResponsibles (CR) and theSchoolExecutives (i.e., the principle and the vice principal(s)). Both categories face difficulties when exercising their duties:

1. Teachers occasionally overlook registering hourly expulsions both to MySchool and to the DAB. This situation results in invalid absences making it too difficult for the Administration to detect and, thus, to sustain accurate absence statistics.

2. Errors are made due to the complexity of the procedures, i.e., sometimes absence marks are not signed by the teacher, absences scattered over many DABs are often overlooked when summing up totals, etc.

3. Reception of the update notes, sent by CRs through postal services, cannot be verified. The legislation that allows School Units to inform parents about absence statistics, apart from the traditional postal services, also via email and SMS services, is quite new and is being applied only for a few months and only utilizing the email mechanism. This limited-time application verified a previous research conducted according with which only 13% of parents can use email services with ease and, therefore, prefer other means of communication, e.g., SMS services.

The following necessities apply to school executives:

4. The necessity to centrally monitor all files related to absences (i.e., DABs, external documents, expulsions' file, update notes sent to parents, etc) as well as to quickly track any misapplications or overapplications of administrative procedures. For example, the Administration needs to track the CRs not informing parents in time or at all, the teachers not registering expulsions in MySchool, the teachers making excessive use of hourly expulsions, etc.

5. The necessity to reduce operational expenses regarding School's obligation to periodically inform parents about their students' absence totals. The cost for mailing via postal services is 0.80€ per letter meaning that, for a 500-student Vocational Secondary School, the related expenses will rise to a level of 1,600€ annually, an amount that no public school can afford in Greece.

6. The necessity to provide the parents with information about their children's absences as quickly as possible when visiting school. This is a very frequent daily task that executives, as well as CRs, have to accomplish. And having the information scattered to many files, organized in non-digital forms, results in both parents and personnel wasting their time while the related and latest information is being gathered.

7. The necessity to reduce the working hours spent by personnel when transacting with non-electronically organized files containing absence information. In the research conducted in the context of this work (Figure 5), it

was concluded that 19 working hours are spent per week in a 30-class Vocational Secondary School in tasks related to absences.

4 RELATED RESEARCH

According to RMSA 2015, the educational management information systems (EMIS) are composed by systems and procedures used to collect, process and manage information referring to an educational unit. An intergraded educational management information system (IEMIS) encapsulates information about the students, the school personnel, the finances, the administrative procedures, the educational content, the premises, the students' performance as well as any further information that could be of use in tactical or strategic planning. The data handle by the IEMIS are used by the Ministry of Education, by other ministries, by regional or local authorities, by researchers, donators, guardians, teachers or students. An IEMIS can present indices that help the Administration to monitor the system performance and also to assist in managing the available resources.

The significance of EMIS on educational planning is signalized in Stachteas, C. 2002 and Stachteas, C. 2009. EMISs, in their early form, attempted to computerize the student files as well as the financial management of the school unit and, in their later form, to improve the quality of information, to save resources (e.g., time, effort and means), to computerize the procedures of registration, fee collection, report generation and timetable creation (Eaton J. & Christou, E, 1997; Samaha, A. & Shisharkly, R, 2008).

In Samaha, A. & Shisharkly, R, 2008, 80% of the parents of elementary school students in United Arab Emirates stated that computerization of monitoring of daily student attendance is an urgent issue.

Hua and Herstein (Hua, H., & Herstein, J., 2003) identified the principles that an EMIS should apply. In accordance with Hua and Herstein, three are the success factors of an Intergrated EMIS (IEMIS): (a) the timely and reliable production of data/information, (b) the integration and the sharing of data across the school unit, and (c) the effective use of data/information while making administrative decisions.

In Cuartero, O.L. & Role, M. 2018, an IEMIS is defined as a system of eight (8) subsystems, namely the subsystem of students, personnel, curriculum, legislation and control, premises, finances, services to society, and planning, reaching and evaluation of the whole system.

The effects of EMISs on school units were examined through an extended bibliography research in Shah, M., 2014. Among EMISs' benefits lie the quick access to the information, the effective administration, the effective use of resources, the reduction of the workload, the efficient time management and the improved report quality. Drawbacks are considered to be the lack of time to migrate to the new system and the need to re-train the users of the new system.

Telem, M. & Pinto, S., 2006, studied the effect of EMISs on parent-student relations through a yearly research conducted at a Vocational School in a mid-ranged social and economic profiled region. The frequent, detailed and automatic parental update on issues regarding student performance, behavior

and attendance led to a clear improvement of relations between parents and students, parents became familiar with both school and teachers, and encouraged them to get involved in their children's educational course more intensively, more frequently and in a more focused way.

Capterra is a web platform that compares around 400 EMISs based on a wide variety of criteria. The cons of the above systems are that they are not designed to conform to the Greek legislation, they do not support the Greek language and the cost of usage is very high.

In developing countries, EMISs have been developed in order to overcome the poverty, the lack of resources, the lack of sustained power supply, etc (Valachis, I, et al., 2008; OpenEMIS, Shaikh, H. 2017, Goldsmith, C. 2017, Kurt, M. 2017). Those systems take advantage of the SMS technology so that an effective communication channel can be established between the school and the Ministry.

Greek EMISs, such as Soft1 EDU, Tutor, 4Schools and Classter, do not handle the complex administrative procedures related to student absences as dictated by the Greek legislation for the public schools of Secondary Education. Furthermore, the Greek Ministry of Education developed its own EMIS, named MySchool, in an effort to unify all previous ISs.

The conclusions drawn from the above survey are concentrated in that (a) the administrative tasks related to student absences pose high workload on personnel, (b) there is no absence-oriented EMIS conforming to the Greek legislation, and (c) School Administration faces inherent difficulties in monitoring the absence-related procedures.

5 THE PROPOSED INFORMATION SYSTEM

An EMIS was introduced in order to tackle with all issues presented in the Motivations' section. The IS was built as a web application, based on open technologies while utilizing SMSs (Short Message Service) in order to realize parental updates. All files related to student absences (e.g., penalties and external documents) were intergraded into the proposed EMIS, new individualized reports containing all the information referring to a student were generated, means for intergrading with MySchool was developed, and tools for assisting Administration monitor all the processes related to the absences were built.

6 RESULTS

The proposed EMIS, under the title eabs, was set up to operate for the 2nd Vocational School of Katerini during school years 2016-2017 and 2017-2018. A considerable number of users were involved in the EMIS processes: 27 teachers, 3 executives and almost all parents.

During the school year 2017-2018, 1,789 SMSs were sent to parents with a total cost of 89.45€. The cost of postal updates for the same number of updates, would be 1,431.20€, which implies a saving of 1,341.75€ (93.75%). Even if we assume that 5.3% of the parents would prefer being updated via email services rather than SMS services, the total saving would still be considerably high (1,272.00€). Furthermore, if the fixed

costs, such as costs for web hosting and reserving a domain name, are taken into account, then the total saving would range from 83.97% to 83.43%.

To measure the degree of satisfaction of parents, teachers and executives as well as the potential expansions of the proposed EMIS, three questionnaires were composed respectively. Each questionnaire comprised mostly closed questions. The questionnaires addressed to parents were handled to them in February 2017, after the first term, and 173 of the parents filled them out. Furthermore, the questionnaires addressed to the teachers who were responsible for a class of students, were handled in June 2017, after a full operational cycle of the proposed EMIS. Finally, the questionnaires addressed to the executives of the school were handled also in June 2017.

7 SATISFACTION OF PARENTS

The first aspect investigated regarding parents was their satisfaction stemming from the new way of getting informed. 73.5% of the parents stated to be very to extremely satisfied with being informed via SMS services about their children's absences while 7% stated to be slightly or not satisfied at all (Figure 1). This result confirms that the proposed EMIS covered a true need of the parents.

A second research question posed to parents was about the frequency with which they wished to be informed about their children's absences and the alternative types of information contained in the received SMSs. Half of the parents stated that they would like weekly updates via SMSs, while the other half of them prefer daily or hourly updates. Furthermore, one third of the parents stated that they would like to receive information enriched about various school events and invitations to events related to parents (Figure 2). In order to enjoy hourly SMS updates, 43.8% of the parents are willing to contribute a total of 7€ per year, while 72% of the parents are willing to contribute a total of 2€ in order to get weekly SMS updates (Figures 3 and 4).

Figure 1: Satisfaction stemming from updates via SMSs

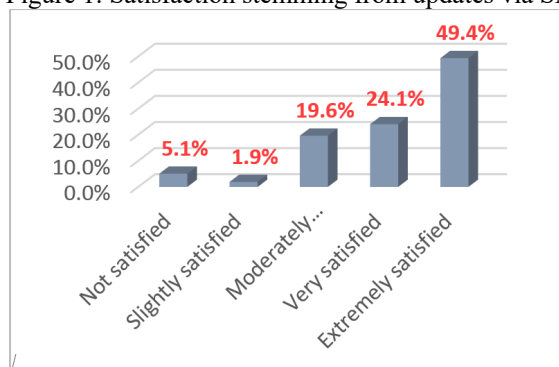


Figure 2: Anticipated features

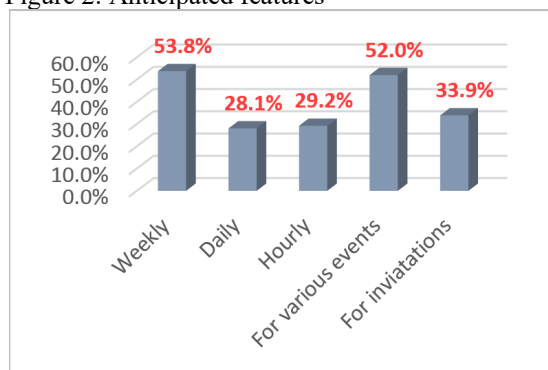


Figure 1: Willingness to finance hourly updates

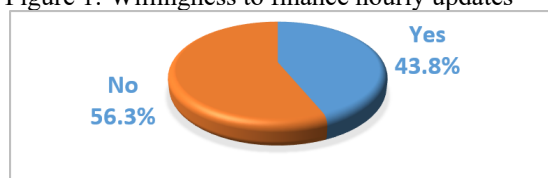
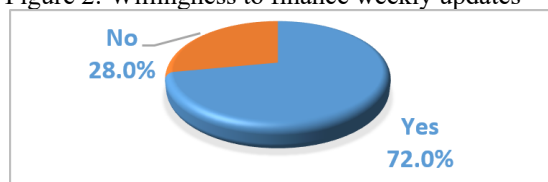


Figure 2: Willingness to finance weekly updates



7 SATISFACTION OF TEACHERS

Initially, the effect of the proposed EMIS on the workload of the teachers being responsible for a class of students was investigated. Teachers reported an average drop of 42.85% on the time they spent administrating all issues related to absences (Figure 5). In particular, the workload oriented to preparing monthly updates, showed a decrease of 63.85% when replacing postal services with SMS services (Figure 6). Based on Figure 5, there is a reduction of 37.8 minutes per week per class on the workload when using the proposed EMIS, or $30 \times 37.8 = 1,134$ minutes or 19 hours per week.

Furthermore, in-time monthly parental updates, i.e., the updates delivered in the first five days of each month, showed an increase of approximately 75% while updates delivered between the 6th and the 10th day of the month were reduced by a factor of about 35.4% (Figure 7).

Finally, regarding the features that teachers would like to see embedded in future versions of the proposed EMIS, 85% of the teachers are eagerly looking for SMSs being able to be sent to the parents automatically by the EMIS itself. Moreover, 38% of the teachers would like to be able to access the proposed EMIS from their homes or via their mobile phones as well as to register absences from within the class using tablets (Figure 8).

Figure 3: Weekly workload (in minutes)

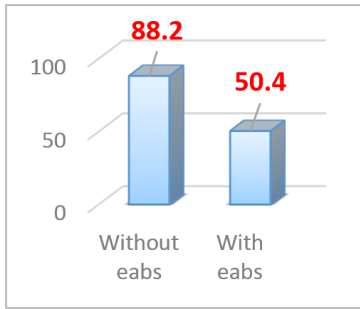


Figure 4: Weekly workload for monthly updates (in minutes)

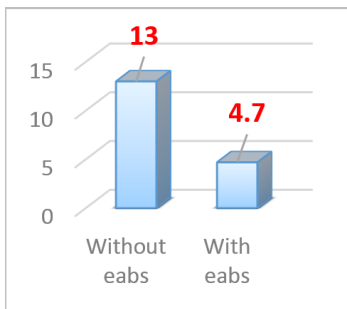


Figure 5: In-time delivery of monthly updates

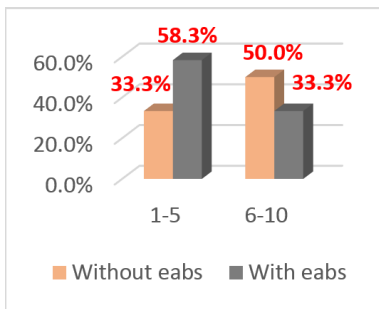
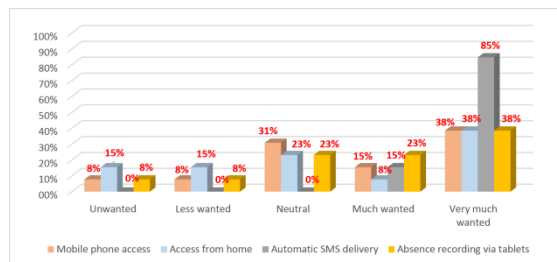


Figure 6: Desirable features

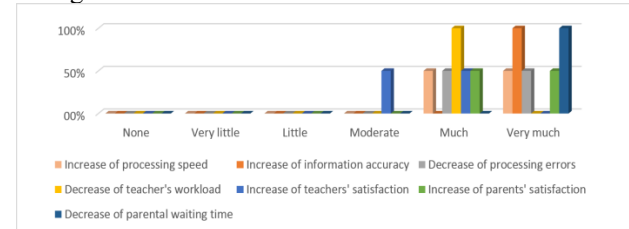


8 SATISFACTION OF EXECUTIVES

The questionnaire addressed to executives was filled out by the two vice principals of the school. After the proposed EMIS had been introduced, both of the vice principals witnessed quite a teachers' workload reduction, an increment of the accuracy of the information handled by the system, and a quite considerable decrease of the time parents have to wait in school in order to get informed about their children's

absences (Figure 9). Additionally, the vice principals believe that teachers' satisfaction was increased from a moderate-to-high degree. An even greater degree of improvement (high-to-very high) was realized about the processing speed of administrating all the absence-related processes, as well as about the satisfaction of the parents. Finally, a high-to-very high degree of reduction was also reported regarding the errors generated when administering student absences.

Figure 9: Effect on seven aspects related to absences' management



9 CONCLUSIONS AND FUTURE WORK

In this paper, a new way of organizing all the processes related to monitoring student absences was proposed introducing a new educational management information system. The EMIS supported the operation of the 2nd Vocational Secondary School of Katerini during the school years 2016-2017 and 2017-2018. The impact of the proposed EMIS was measured by issuing three types of questionnaires to parents, teachers and executives respectively. The conclusions derived from the analysis of the questionnaires indicated that the proposed EMIS (a) satisfies the Administration's obligation for keeping the parents informed with thorough, immediate and accurate information, (b) reduces the operational cost of parental updates, and (c) reduces the workload of teachers. Furthermore, the EMIS embodies the Greek legislation, prevents teachers from making mistakes when handling absences, provides Administration with tools able to centrally supervise all the absence related processes, and increases the satisfaction of parents as well as that of teachers.

Finally, the above-mentioned research revealed the need for expanding the proposed EMIS with new features. Firstly, automatic SMSs could be sent to parents by the EMIS without the intervention of teachers. Secondly, a future expansion of the EMIS could incorporate the use of mobile devices such as tablets in order to replace the traditional absence books when registering absences from within class. This way, the most important information can be digitally inserted directly into the EMIS further reducing the transactions of teacher with EMIS for purposes of digitalization. Finally, an even tighter integration of the proposed EMIS with the EMIS of the Greek Ministry of Education could obviate the need for teachers putting extra effort on keeping the latter EMIS up to date with absence statistics.

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