IMPROVING ACADEMIC PERFORMANCE THROUGH ONLINE REALTIME ATTENDANCE MONITORING: A CASE STUDY AT AL FATEH UNIVERSITY

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ABSTRACT
In this paper, a scheme is proposed to improve the academic performance of students by monitoring their attendance daily online in real time. The technique consists of the following steps: a teacher goes to the class room with his laptop, takes the attendance and sends it through wireless internet to all the concerned officers. The attendance goes not only to the Head of Department, but also to the Dean, the Registrar and the Vice Chancellor for information and to the Officer-In-Charge of Computer Center, Server-Room, etc. for record keeping. Here, the attendance is available instantaneously online in real-time to all concerned, so, the chances of manipulation is not possible, since updated (daily) attendance are being sent by each teacher online through wireless internet. For testing this, a low-capacity wireless internet transmitter-receiver (Access Point from Dlink) was installed in the internet server room of Computer Science Department of Faculty of Science / Information Technology at Al Fateh University, Tripoli (Libya). The wireless signal was made available to the adjoining class rooms and lecture theatre and laboratory rooms. The information for attendance was organized in excel sheet. It was sent by laptops (fitted with wireless internet) from different class rooms and labs to the officers and authorities which was received by them instantaneously in their simulated e-mail accounts. In future, a campus wide wireless internet and associated university database is being proposed for the actual working of the scheme, to improve the academic performance of students.

KEYWORDS
Monitoring attendance, Students’ academic performance, online real time, wireless internet.

1. INTRODUCTION
There is increasing trend for higher education institutions to be expected to monitor student attendance, on assumption that better attendance leads to higher retention rates, higher marks, for continuing funding, and more satisfying educational experience [1]. Recently, some research reports show as to how to monitor the attendance of UG and PG students in UK and use of technology for monitoring student attendance [2-4]. They outline draft plans for monitoring student attendance in the University of Edinburgh [2-3] and University of Ulster [4]. In particular, the guidance paper gives details of a pilot on attendance monitoring, starting from Feb.1, 2010 [3]. The purpose is that the College can invoke the procedure for withdrawal and exclusion (or discontinuation) from studies for foreign students from continuation of their visa [2]. Prof K Greenon and Dr P Nicholl submitted a funding project to consider electronic methods for attendance monitoring [2-3]. Not only in UK, but also in USA, Australia and other countries, there had been many efforts to automate student attendance to improve the quantity and quality of attendance data to enhance academic performance [5-15]. However, some papers do not talk about online real time monitoring of student attendance. They wanted to use the conventional type of monitoring. In this paper, a scheme is proposed to monitor attendance daily online in real time (i.e. instantaneously) by using innovative technique of information technology, viz. Wireless Internet. The purpose of the scheme is to increase student performance in study, by implementing real time on line student attendance monitoring system.

The organization of the paper is as follows: Section 1 contains Abstract and Introduction. In Section 2, old and conventional system of Monitoring of Students Attendance is presented, while Section 3 explains our scheme for implementing Real Time Online Student Attendance Monitoring System. Conclusion and Future Work is suggested in Section 4, and Acknowledgement is given in Section 5. Section 6 gives the list of relevant References.

2. MONITORING OF STUDENTS ATTENDANCE

2.1 Need For Student Attendance
Main concern of any academic organization is the improvement of student academic performance in theory and lab classes along with their co-curricular activities, and extra co-curricular activities. The academic performance is checked by marks obtained in theory and lab examinations. These examinations are taken at different levels, viz. in class tests, in mid semester exams, in final semester exams, etc. Generally, it is found that some students do very well in their examinations, and some students do not do so well. Who do well in exams? Those students, who come to the college regularly, are punctual in their theory and lab sessions, attend their classes sincerely, and try to understand the subjects properly. Who do not do well in exams? Those students, who do not come to the college daily, are not punctual in their theory and lab sessions, do not attend their classes sincerely, and so, they do not understand the subjects properly. As a result, they lose interest in study. Moreover, there is no specific system to monitor their attendance daily in real time and none to remind them that they were absent. Also no
corrective action is taken instantaneously by college / university authorities for their absence.

2.2 University regulations for Annual / Final Examination
Usually, the University regulations debar a student from appearing in final University examination, if his attendance falls below certain percentage during the entire semester.

2.3 Manual System
In many colleges and institutions, the Management Committee insists on manual system, in which each teacher submits the list of absent students to the Head of the Department (HOD), and HOD forwards it to the data entry operator / clerk for recording attendance in central computer system. In some organisations like Stevenson College, Paper Registers using Optical Character Reader (OCR) for direct data entry from tutors' laptops is also used [18]. But, the manual system has many problems. Sometimes, the absence / presence is not recorded same day and same time due to many factors. There may be lapse on part of data entering clerk, non submission of absentee’s list by teacher, or missing of the list forwarded by the teacher, due to unavoidable reasons.

3. ONLINE REAL-TIME MONITORING SYSTEM

3.1 Background
In 2007, one of the authors of this paper joined as Principal, Truba College of Technology, Indore (Madhya Pradesh, India). It was realized in this college that there was no robust and full proof system for recording absence of students in real time, so that the absent student and his parents can be informed regularly at proper interval, and he is made aware of falling attendance well in advance, and he takes care of his absence in time. It will also help the College Management Committee to take corrective action about each student for his absence / presence. Thus, no student will be penalized unnecessarily, and college academic performance will be good and it will improve in future. After some time, the Principal joined Al Fateh University, Tripoli (Libya) and discussed the same matter with HOD, and they also wanted to find some solution for the problem. It was agreed to develop a prototype system to monitor student attendance online in real time using wireless internet. For this, an experiment was done as explained below:

3.2 Wireless Internet Trans-Receiver (Access Point)
A low-cost, low capacity Wireless Internet Transmitter - Receiver (Access Point from Dlink) was installed in the Internet Server room of Computer Science Department of Faculty of Information Technology of the University. The wireless signal was made available to the adjoining class rooms, lecture theatres and laboratory rooms as shown in Figure 1.

3.3 Attendance Register Using Excel Sheet
The information for attendance was organized in excel sheet to represent an attendance register as given in Figure 2. It is
3.5 Implementation of the Technique

The technique consists of the following steps: a teacher goes to the class room with his laptop, takes the attendance and sends it through wireless internet to all the concerned officers. The attendance goes not only to the Head of Department, but also to the Dean, the Registrar and the Dean Jamia (i.e. Vice Chancellor) for information and to the Officer-In-Charge of Computer Center, Server-Room, etc. for record keeping purpose.

The information of student attendance (for various classes / labs) by different teachers were sent through the wireless internet using their laptop computers online in real time (i.e. instantaneously) from the adjoining class rooms, labs and lecture rooms to concerned officers and authorities in their email accounts. The attendance was made available and was received by them instantaneously in their simulated email accounts. They could see them immediately or later.

3.7 Display of Daily, Weekly and Monthly Attendance on Website

With the help of the scheme, the computer centre can display Daily, Weekly and Monthly Attendance on Website, as well as on various notice boards of the Departments and Faculties. For short attendance, red colors are added, so that students and parents are aware and corrective action may be taken by them before they are debarred from the final examination.

3.8 No chance for manipulation later

Here, attendance is available instantaneously online in real-time, so, chances of manipulation in attendance is not possible.

3.9 University Database and Wireless Internet

For the implementation of the full scheme, a campus wide wireless internet for the entire university/organization can be developed. Further, a university database is proposed for the actual working of the scheme. The basic tables in the database may be details about departments, students, subjects, teachers, class/labs rooms, days and periods of study, etc. Specialised Tailor-made software programs may be written. However, some software packages are available on internet with details of their software and hardware requirements by many authors and vendors [19-24].

4. CONCLUSION AND FUTURE SCOPE

The purpose of the scheme is to monitor student attendance daily every hour / period through wireless internet and present report daily, weekly and monthly and made available to all concerned persons like management committee members of the university, students and their parents to take corrective action in time. It will force all the students to come to attend class daily, the student will understand the subject properly, and so, he has interest in the studies, he works hard, he becomes more knowledgeable, he enjoys the class lecture and he feels happy.

However, this scheme will cost for the laptops for each teacher, wireless internet implementation, and development of database for the entire university, but the advantages achieved will be manifold than the investment. The students are alert, the teachers will be more sincere, since indirectly their physical presence is also monitored and they will have to be more conscious in their teaching activities. The final outcome of the scheme is academic performance of the department / faculty / university is enhanced, result is good, college dropouts are less, every person is literate in the country, and thus, the nation can prosper better and better to have nice future to become strong in all respect.

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