



Design and Evaluation of an Application for Recording of Pharmacy Students' Attendance via Smartphones and Personal Computer

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ABSTRACT

Background: Attendance management is one of the most important issues in the educational institutions. The traditional method for attendance recording is manually recording by professors in the school or university which is associated with several problems. We proposed the design and utilization of an electronic application for students' attendance recording via smartphones and PCs.

Methods: This study was a cross-sectional and Quasi-experimental study, which held in the department of clinical pharmacy in the school of pharmacy in Ahvaz Jundishapur University of medical sciences. Group I was assigned to the manually recording of student attendance. Group II was assigned to the design and utilization of an electronic application for registration of attendance. Each of the professors records the students' attendance in the class by smartphones. Finally, the satisfaction of the professors about the application was assessed with the 6-item questionnaire. Also, the efficacy of the application was evaluated through the comparison of the number of recorded attendance and the number of absent recorded in group I and II.

Results: The results of satisfaction survey illustrated that all of the professors found the electronic recording of the attendance was the more useful than the traditional method and lead to the reducing the possibility of errors, the time spent, and the pleasure of students. Also, the comparison between the numbers of students' recorded attendance and numbers of absence recorded were higher by utilization of the application more than by the traditional method.

Conclusion: The students' attendance recording application can improve performance compared to the manually attendance management system via decreasing the possibility errors and continuous assessing during a semester.

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Introduction

Nowadays the utilization of electronic programs has

achieved a critical role in the educational system and improved teaching methods and classroom management systems (1).

Attendance is one of the important parts of the educational program. On the other hand, students' attendance is the part of the continuous assessment during the period of the session and it can sometimes be

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considered as a part of final exam score (2, 3). Controlling of students' attendance can lead to reducing absenteeism (4).

To date, the attendances are recorded manually by the professors (1). Considering that a lesson may be educated by a group of professors, the students' attendance need a number, so the attendances recording may be prone to personal errors (1, 5, 6). Besides, the utilization of paper for the recording of attendance could allow impersonation and these sheets could be stolen or lost (5, 6). For example, the other method for registration of attendance is writing the students' names that students may write their friends' names who are not present in the class (2). Thus, there is a critical need for a system that can diminish all of these problems. Several technologies provided the registration of attendance such as biometric (5), RFID (1), NFC (2) that all of them need to be handled by applications and direct participation of students, therefore these methods are associated with problems and limitations. Ultimately, it seems with broad access of all people to the electronics devices and the providing of wireless internet or 3G can be designed for the simple applications, help the problems mentioned.

Nowadays, information technology (IT) is an integral part of society and according to rapidly increasing pace and development of designing electronic soft wares (7); it seems can set on multi-user application development for accessing all the members of a department.

Ultimately, the present study proposes an application that will help a department includes a number of tutors in universities to automated student attendance. We were designed to assessing of implementation of educational attendance management system via the using of an electronic application in the smartphones and laptop computers.

Methods

This study was a cross-sectional and Quasi-experimental study, which held in the department of clinical pharmacy in the school of pharmacy in Ahvaz Jundishapur University of medical sciences. Group I is assigned to the manually recording of student attendance.

Group II was assigned to the design and utilization of an electronic application for registration of attendance. Each of the professors records the students' attendance in the class by smartphones.

Needs assessment

Need assessment of the four professors of Clinical Pharmacy department of the school of pharmacy showed regularly recorded attendance of students as critical, but two members described the effectiveness of traditional method was moderate and two other described feebly. Consideration of the accessibility of smartphones, we decided for design and preparation of the application.

Design of attendance management application

Useful items in this application selected based on the assessment of the professors of Clinical Pharmacy department that included:

1. The application must have the ability to use multiple users at the same time.
2. Every user have their special username and password.
3. One of the users have the accessibility for attendance recorded by the other users.
4. The application can be used online and offline.
5. The application has the ability of record and store of information in offline mode. In online mode, these recorded data will be available to the home user. In the other words, recorded information will be a permanent record.
6. The possibility of receiving of recorded attendance information provided by the output file.

Assessment of the efficacy of the application

Each of the professors recorded the students' attendance in every course for all of the lessons in the class by smartphones. Finally, the professors were asked about their satisfaction of new methods for recording of student's attendance. The 6-item questionnaire was distributed to four professors that presented these lessons. The questions were developed on a five-point Likert scale ranging from 'strongly disagree' to 'strongly agree'. The report of percentage or means of the answered each option was used as results. Also, the efficacy of the application by professors is evaluated through the number of recorded attendance by application and the results were compared with the previous method by the utilization of paper for attendance.

At the end of the period, the number of student's recorded attendance and the number of absent recorded by the application were compared with these recorded by the traditional method. The comparison was accomplished between the same lessons with presented by same professors. These lessons include pharmacotherapy 1, 2, and 3, drug information theory section of basic pharmacy clerkship and hospital pharmacy.

Results

The proposed application provides the solution to students' attendance problems through the use of attendance application in professors' smartphone devices and their computers. They use username and password for signing in this application. These user name and password were registered by the system administrator.

the semester, the name, family and Identification Code of every professor were defined in PC application. The various lessons, which were provided by the department of Clinical Pharmacy, were defined in the application. Also, the same information of every student is defined in

Table 1. The results of satisfaction survey of professors form the attendance electronic application.

Questions	strongly agree	Agree	No idea	Disagree	Strongly disagree
1. Was the electronic recording of the attendance the more useful than the traditional method?	100%				
2. Was the use of attendance application lead to reducing the possibility of errors?	100%				
3. Was the use of attendance application lead to decreasing the time spent?	100%				
4. Was the use of attendance application lead to reducing of the pleasure students?	100%				
5. Were you satisfied from the accessing to the attendance recorded information of students by other professors with using the application than the traditional method during the semester?	100%				
6. Are you generally satisfied from the using of application for attendance recording	100%				

PC application. This Information could be added either as a group by an excel file or individually in the application.

The students' attendance recorded in offline or online mode by smartphone and in online mode by PC devices. For recording the attendance, the professor must select the intended lesson, then fill the checkbox related to every student in the smartphone, therefore unfilled checkbox automatically considers as the absence. Date and time of this application were set automatically synchronize with smartphones, while for recording in PC devices. The important thing is that edit of information can be done only by admin. Ultimately, we can select the intended lesson, then we can download attendance's output file as an excel file. The results of professors satisfaction survey showed all of them were strongly agree that the electronic recording of the attendance was the more useful than the traditional method. Also, all of them defined that the use of attendance application leads to reducing the possibility of errors, decreasing the time spent and reducing of the pleasure students. Besides, all of them was very satisfied from the accessing to the recorded attendance information of students by other professors with using the application than the traditional method during the semester. Generally, the using of application for attendance recording lead to very much satisfaction of the professors. These results are shown in Table 1.

The comparison results of the ratio of the numbers of students' recorded attendance to the whole number of sections by traditional method (group I) and by the utilization of application (group II) described in Table 2.

The comparison between the numbers of absent recorded in group I and II show in Table 3.

The number of complaints made by students was 14 items in group I while in group 2, no complaint received about the number of absences recorded. Therefore the utilization of application for attendance recorded can lead to reducing of the pleasure students.

Discussion

Managing students' attendance is one of the important issues in the educational program. The traditional method attendance registration via using the papers have the several errors potential include wasting a lot of time spent for collection, personal errors, and getting lost of the papers. Therefore, there is a requirement of the user-friendly, portable, energy efficient and secure automated system that can decrease all of the notified problems (6). Nowadays, several technologies implemented for the registration of attendance which is more effective and efficient method of recording, monitoring, and registration of students' attendance (2).

For example, Arulogun et al., illustrated the using of RFID for student attendance monitoring leads to the eliminating time wasted and monitoring in face-face classroom (1). Also, Patel and colleagues showed RFID (Radio Frequency Identification) technology can be a useful application in helping to control student's attendance throughout the automatically recording the movements and locations of students in a classroom (8). Shoewu et al., described the biometric (fingerprint)

Table 2. The comparison of the ratio of the numbers of students' recorded attendance/ the whole number of sections between group I and II.

The lessons' name	pharmacotherapy 1	pharmacotherapy 2	pharmacotherapy 3	BPC ¹	HP ²
Group I	13/24	12/24	10/24	16/24	8/17
Group II	19/24	20/24	20/24	22/24	14/17

¹ basic pharmacy clerkship (related to drug information theory section)

² hospital pharmacy

Table 3. The numbers of absent recorded in group I and II.

The lessons' name	pharmacotherapy 1	pharmacotherapy 2	pharmacotherapy 3	BPC ¹	HP ²
Group I	97	62	105	74	61
Group II	168	282	112	85	97

¹ basic pharmacy clerkship (related to drug information theory section)

² hospital pharmacy

identification can improve the performance of manual attendance management system and decrease the time of recording the attendance (5).

In this study proposes an application that there is no need to be handled a special device or direct participation of students. We were designed the student's attendance recording system via the using of the multi-centers electronic application in the smartphones and laptop computers. The results of satisfaction survey show the using of application lead to reducing the possibility of errors, decreasing the time spent and reducing of the pleasure students and increasing the satisfaction of the professors.

The comparison between the numbers of students' recorded attendance and numbers of absent recorded showed these recorded by utilization of the application more than by the traditional method.

In conclusion, the electronic application for attendance recording can improve performance over the manually attendance management system.

References

1. Arulogun O, Olatunbosun A, Fakolujo O, Olaniyi O. RFID-based students attendance management system. *International Journal of Scientific & Engineering Research* 2013;4(2):1-9.
2. Ahmad BI, Mantoro T. Managing Students' Attendance using NFC-Enabled Mobile Phones. *Critical Socio-Technical Issues Surrounding Mobile Computing* 2015:184.
3. Hosur R, Savakar DG. Attendance Management System. *International Journal of Advanced Research in Computer Science*. 2016;7(2).
4. Banerjee R, King EM, Orazem PF, Paterno EM. Student and teacher attendance: The role of shared goods in reducing absenteeism. *Economics of Education Review* 2012;31(5):563-74.
5. Shoewu O, Idowu O. Development of attendance management system using biometrics. *The Pacific Journal of Science and Technology* 2012;13(1): 300-7.
6. Singh M, Khan MA, Singh V, Patil A, Wadar S, editors. Attendance management system. *Electronics and Communication Systems (ICECS), 2015 2nd International Conference on*; 2015: IEEE.
7. Bailey JL, Stefaniak G. Preparing the information technology workforce for the new millennium. *ACM SIGCPR Computer Personnel* 1999;20(4):4-15.
8. Patel R, Patel N, Gajjar M. Online students' attendance monitoring system in classroom using radio frequency identification technology: a proposed system framework. *International Journal of Emerging Technology and Advanced Engineering* 2012;2(2):61-6.