Monitoring lecture attendance as a tool for understanding student performance

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Abstract

Background: Time management has been a major factor for students in the fourth-year undergraduate medicine resulting in some not attending lectures at the author's university, and as a result the pass rate has not been optimal. Through correlating student performance against attendance, it has been interesting to assess how attendance impacted their learning.

Purpose: 1) To monitor students’ attendance at lectures using a mobile student card reader; and 2) to correlate the attendance with performance to understand the relationship for individual students, and as a class.

Method: A pilot study using a mobile electronic card swiping machine connected to the university network and software application, to obtain the attendance data of the 2015 academic year correlated with the four semester tests and final examination marks.

Results: In a class of 175 students two of the top 10 students attended below 50%, and three students who failed both the tests and the final examination attended less than 20%. Three others were also identified as poorly performing despite above 80% attendance.

Conclusion: Monitoring attendance and correlating it with performance has identified students at risk, and provided an understanding of how lectures contributed in the individual student's learning. Whilst counselling, sharing attendance trends with the student has promoted reflection and behaviour change.

Keywords: Undergraduate Medicine; Attendance; Mobile electronic recorder

Introduction

In South African Higher Education, especially in the undergraduate programme for Medicine, the curricula at
various universities have evolved into a combination model being integrated, inter-disciplinary, work-based and community focussed (Harden, Sowden, & Dunn, 1984; London, Ismail, Alperstein, & Baqwa, 2002). This inevitably has led to an overloading of activities, clinical exposures, and teaching sessions in the available timeframe of the programme. Didactic lectures in the undergraduate medicine programme still remain the norm in South Africa as they provide an economic way of explaining the difficult concepts and applications to large class groups (Cleary-Holdforth, 2007).

It has been controversial amongst universities and academics locally and globally regarding whether lecture attendance should be made compulsory as a policy (Feldman, 2013); (St. Clair, 1999). Studies and surveys have been done at specific universities to analyse whether attendance positively affects the learning performance and the findings are variable amongst the sites of study. Other factors such as the quality of the lectures, the lecturer’s communication skills, infrastructure, and information technology support in the big lecture halls, may all contribute towards reasons behind poor attendance. Thus, a direct correlation between attendance and performance may not be possible (Bati, Mandiracioglu, Orgun, & Govsa, 2013; Dolnicar, Kaiser, Matus, & Vialle, 2009; Field, 2012; Kottasz, 2005).

At the author’s university, there has been ongoing discussions amongst academics and course coordinators in cancelling didactic lectures based on poor attendance, but not resulting in any final decision. In the university’s context of socioeconomic diversity, with the majority of students coming from previously disadvantaged communities, that has lead to inadequate academic preparedness, a culture of poor communication and passive learning, which are all part of this diversity. Around 50% of students fail to access available online resources, and take up extra support provided by the department or engage individually with the lecturers.

Although the university made a policy of 75% compulsory attendance, there has been no infrastructure provided or resources available to record the attendance electronically at the lecture halls. Manual recording of attendance is laborious, and is subject to inaccuracy and student cheating, thus may not reflect s. A pilot study using a mobile electronic access card swiping machine (attendance recorder) was conducted to understand the relationship between the performance and the average attendance as a class, and in the individual students.

**Purpose of the study**

1. To monitor lecture attendance using an attendance recorder;
2. To correlate the attendance with the performance to understand the relationship for individual students, and as a class.

**Method**

A pilot study was conducted using comparative analysis of the average attendance and performance of individual students, and of the whole class for each semester throughout the academic year of 2015. The students and also the lecturers swiped their access cards on the mobile attendance recorder before and after each lecture. Data was remotely stored on the campus intranet server, downloaded, saved as Excel spreadsheets, and analysed. Lecturers carried the attendance recorder to the learning event for recording attendance, and returned it for recharging and downloading data. The administrative officer of the department was trained for these procedures. The data recorded the student’s name and number, the venue, date and time of swiping. The introduction of the mobile attendance recorder and purpose was announced to students prior to commencing use.
After each semester test, individual counselling was provided for the students who had not passed, their attendance record discussed, and an improvement plan designed. Students who passed with distinctions were interviewed at the end of the year to learn what factors had contributed to their successes.

**Results**

The graphs show the attendance trends of: Whole class versus the performance per semester test for the year (figure 1); Average attendance per lecturer (figure 2); Attendance trends and marks of the top 10 students in 2nd semester (figure 3); and lastly Average attendance and performance of the three students who failed the year (figure 4).

The attendance recorder was used from the beginning of the second semester 2015, thus the data represents second, third and fourth semesters from March to the end of November 2015. The overall class average attendance in the pilot period and average pass rates showed positive correlation, although not interestingly consistent in the last semester (Figure 1). In the class of 175 students, 53 students failed the first semester test and amongst them 40 attended lectures less than 50%. At the second semester test, 25 failed of which 22 attended less than 50%. At the third semester, 13 failed and 12 of them attended less than 50%. At the final examination, 36 students failed and 30 of them attended less than 50% in the last semester, whilst the remaining 6 attended more than 50%. These 36 students went for the re-examination and 3 did not make it, thus failed the year.

**Figure 1 – Whole class attendance against performance for the year.**

**Figure 2 – Average attendance per lecturer**

The top 10 students passed with distinction and two out of 10 attended less than 50% in the 2nd semester. The rest of the 10 attended very well. Amongst the three students who failed the tests and the final examination, one had attended very poorly and one did not attend lectures at all in the last two semesters. The last 1 attended 85% and yet failed the final exam, and also did marginally well in the tests.

**Figure 3 - Attendance of top 10 students.**

**Figure 4 - Attendance trend of 3 students who failed the year final marks.**
Discussion

The author teaches and coordinates the subject of Chemical Pathology in the fourth year of undergraduate medicine. The learning outcomes for the students are: 1) the ability to understand the disease causation and process leading to clinical presentations and complications, 2) ability to select the rationalised laboratory tests for patient care and interpretation of results therein. The subject course links the preclinical sciences to clinical medicine.

The department additionally provided all the learning materials and curriculum loaded on CDs for each student, and students were able to access these in their own time. The lectures were also recorded as video lectures in PowerPoint, thus providing flexibility in access and allowing students to learn in their own time before attending lectures. Thus, allowing for the lecture time to be focused on discussing clinical cases after refreshing the salient concepts.

The department provided small group learning using clinical case scenarios once a month and recorded attendance for these events. Due to a shortage of lecturers, existing staff made an extra effort in preparing and then presenting lectures and tutorials to cover the scope. During the lectures, background information and important concepts were explained using examples of clinical cases. Students not attend lectures and tutorials missed out on such learning opportunities.

The assessment was through four semester tests and a final examination. The first three semester tests covered separate scopes and provided formative feedback to the students, whilst the fourth semester test covered the whole scope in an integrated manner. The assessment in this course was in the form of clinical case studies and short
answer questions aligned to the required competency of solving clinical problems using laboratory tests. The formative tests were marked and scores in percentage were accumulated to the year mark out of which students must have a minimum 40% to qualify for the final examination.

The semester tests also provided a formative learning and assessment experience. The memo (model) answers were sent to the student emails, and those who wished to view their scripts could request them through their tutors. Feedback was provided through the memo answers or verbally to individual student who requested it to their tutor. The students’ performance at these semester tests also provided feedback on how the lecturers’ efforts had been realised in each semester.

The data suggests that in the students who had failed the semester tests, the attendance and performance correlate well (majority of failed students attended less than 50%). In general, attendance went down significantly in the successive semesters (figure 1) as most students miss the lectures to prepare for tests from other subjects, but surprisingly the class average mark was hardly affected. This indicates that as the academic year goes by the students’ ability to understand the material without attending lectures increases.

Poor attendance rates with the particular lecturer E and lecturer G (figure 2), prompted an analysis of the student's evaluation sheets for specific lecturers and the feedback showed students could not understand these lectures well. This resulted in discussions with the relevant lecturers and engagement in improving their means of teaching, materials, and communication with the class during lectures.

During individual counselling sessions for students who had not passed the semester test, they were requested to engage with both their scripts and the model answers to realise their failures. This led to discussions on the required study skills for the course, whilst sharing the attendance records with the respective students, prompting reflection of the factors involved. Students were asked how they planned to improve their time management to improve attendance at lectures. At the end of the counselling session the student was required to sign a learning contract with the course coordinator. The use of attendance trends was found to be most effective in improving the student’s ability to reflect on, and commit to their future learning plans.

The top 10 students in the class that had passed with distinction were interviewed at the end of the year, and amongst them two had poor average attendance (figure 3). When interviewed, these two students turned out to be academically brilliant and were able to study independently most of the time. They had also made frequently use of online academic and peer support using emails groups and WhatsApp discussions. All of the top students had also attended the monthly small group learning sessions. These top 10 students are now in their fifth year, and eight of them have become student tutors in the student tutorship programme implemented by the department to facilitate small group learning of the current fourth year students who have been failing semester tests.

Amongst the three students who failed the semester tests and final exam and had to repeat the subject (figure 4), the poor attendance had contributed to the failure of two students, though one had attended most of the lectures and admitted to not paying attention in class. Individual counselling sessions were provided and students were able to realise the root causes of their failures through reflection, and had accepted referrals to relevant support sections accordingly.

During counselling of students who had failed at semester tests, students admitted being busy with other activities whilst in the lecture (usually on their smart phones), and some had attended just to get the attendance recorded without seriously following the discussions. The fact that the failure rate becomes less at subsequent tests suggests that attendance recording, and using the trends at the subsequent counselling sessions, seemed to have helped with students’ ability to realise their difficulties.
The electronic attendance recorder was not commercially purchased, but assembled in-house by staff at the IT and Security departments of the University, thus the cost was minimal. In this project the attendance recorder has been proven to be a useful tool in monitoring individual, group and lecture attendance on a day-to-day basis, as well as in different time periods. It has also monitored the lecturers’ punctuality and student attendance trends at each lecture given by a specific lecturer.

**Conclusion**

The attendance rate and students’ performance do not always correlate as the students view their need to attend lectures differently, some being independent learner, and others requiring face-to-face lectures daily. However, by correlating with performance it can identify students at risk, and assist the coordinator to understand how lectures contribute in the student learning. Subsequently at the counselling sessions, attendance trends can be used as a tool for reflection and promoting behaviour change. A Lecturer’s individually ability can also be improved through monitoring students’ attendance for a particular lecturer.

**Take Home Messages**

1. Attendance and performance relates differently in individual students.
2. Lectures should be provided in an interactive way that provokes thinking and discussions using real life examples of clinical problems.
3. Attendance trends are useful in counselling students as they reveal underlying problems through reflection.
4. Students are diverse in their conception and ability for learning off campus.
5. Attendance data informs the lecturers on the degree of passive learning in their lectures.

**Notes On Contributors**

Dr Aye Aye Khine is the Head of Department of Chemical Pathology at Sefako Makgatho Health Sciences University, Pretoria, South Africa and teaches 4th year undergarduate medical students the curriculum for chemical pathology. She is exploring different educational methodolgies for students who have had disadvantaged backgrounds that impact on their learning abilities, and has a particular interest in E-learning support groups using social media.

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Appendices

Declarations

The author has declared that there are no conflicts of interest.

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