

Simple strategies that improve academic performance of students: An exploratory case study

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Abstract

Every student has a different technique of studying and recalling information. This in turn has a strong association with academic performance. This study was conducted to understand the study techniques medical undergraduate students use to grasp the information they have acquired; to study the association between the techniques and academic performances and to explore the best study techniques that can be adopted by medical students.

Medical undergraduates at the Melaka Manipal Medical College were the subjects of the study. It was a prospective, cross sectional study, in which 210 students participated. A peer validated 12-item questionnaire was administered to students to understand their study approaches. The data for academic performance was collected from student database which classified students into fail, pass and distinction groups.

The study established that linking what has been learned with what they already know as their preferred study approach to remember information; finding reasons and clarifying concepts were other strategic approaches to comprehend information.

Keywords: Study techniques; Academic performance; Medical school

Introduction

Human brain has a lot of hidden capabilities that is still not discovered by us. Human beings have an incredible capacity to learn new skills. Arguably, the most notable impediment to this goal is that learning tends to be quite specific to the trained regimen⁽¹⁾ and does not transfer to even qualitatively similar tasks. Of late, a number of studies have come out to increase the activity and effectiveness of the brain.^(2,3) One being the method proposed by Tony Buzan, such as the “Forgetting Curve”.

The “Forgetting Curve” illustrates the idea that subjects will not actually be able to immediately recall all of the new information they have been presented with, but rather, can achieve 100% recall if they are given a short break to properly “absorb” or “process” the information.^(2,4) Tony Buzan has already discussed the optimum time to recall and the time period for converting short term memory to long term memory.⁽³⁾

Usually students forget new information almost as soon as they learn it. This is especially true in case of medical students whose curriculum is loaded with information.⁽⁴⁾ Hence there is a need to determine the best techniques of study and recalling information as this strongly correlates with the academic performances. Each student has a different technique of processing information. Thus, the best method can be investigated by collecting data from earlier academic performances.

The idea of using the concept of “Forgetting Curve” is not just to reinforce the ideas, but also to use it as a kind of planning guide. This study intends to help medical students in understanding and remembering the vast information efficiently. It helps prepare students to

retain the information as well; which will help them prepare for a better professional career as doctors.

Setting and design: Second year medical undergraduates at the Melaka Manipal Medical College, Manipal University were the subjects of the study. It was an observational, cross sectional study, in which 210 students participated. Student consent and institutional research committee approval was taken for the study.

Materials and Method

A peer validated 12-item questionnaire was administered to students of which ten were closed and 2 were open-ended questions. The responses regarding the mode of study and recall of information were collected from 210 students (174 students of a regular batch of first year MBBS students and 36 refreshing students) who volunteered to participate in the study. The data for academic performance was collected from student database which classified students into fail, pass and distinction groups in three subjects of Year 1 of the MBBS course, namely Anatomy, Physiology and Biochemistry.

Statistical data analysis was performed using SPSS ver.16.

Results

Students at the Melaka Manipal Medical College were categorized into Distinction, Pass or Fail in the University examinations based on the scores obtained. Major findings after analysis of the data collected from students through the questionnaire:

- Students with a “distinction” or “pass” mostly

- acquired information from text books and class notes and used group discussion, flashcards, consultations with teachers minimally. (Fig. 1)
- The same students perceived that the best approach to study was through correlating what is being taught to what is already known, and by clarifying doubts. (Fig. 2)
 - Majority of students who were in the “fail” category, reviewed during weekends or just before the examination (Fig. 3)
 - Information recall and retention time was less in case of students who were in “fail” category, but was longer in “pass” and distinction students. (Fig. 4 and 5)
 - It was also observed that majority of the students with a distinction and pass will forget what has been taught in class after 24 hours, whereas students who failed, forget after 1 hour.
 - Students with a “distinction” and “pass” constantly review the new information for the first time on the same day. However, for the "fail" category students, study on the weekend.
 - Most of pass and distinction students do the second recall in the same block⁵ whereas the fail student they are not doing the second recall.
 - Best study method used by most of the students is by using linear notes followed by reading text books and computerized notes
 - The students also agreed on linking what have been learned with what they already known as their preferred study approach apart from knowing the importance of finding the reasons behind things and looking up things that they do not understand.
 - Some of the “distinction” students opined that “spaced learning” helped them retain maximum information

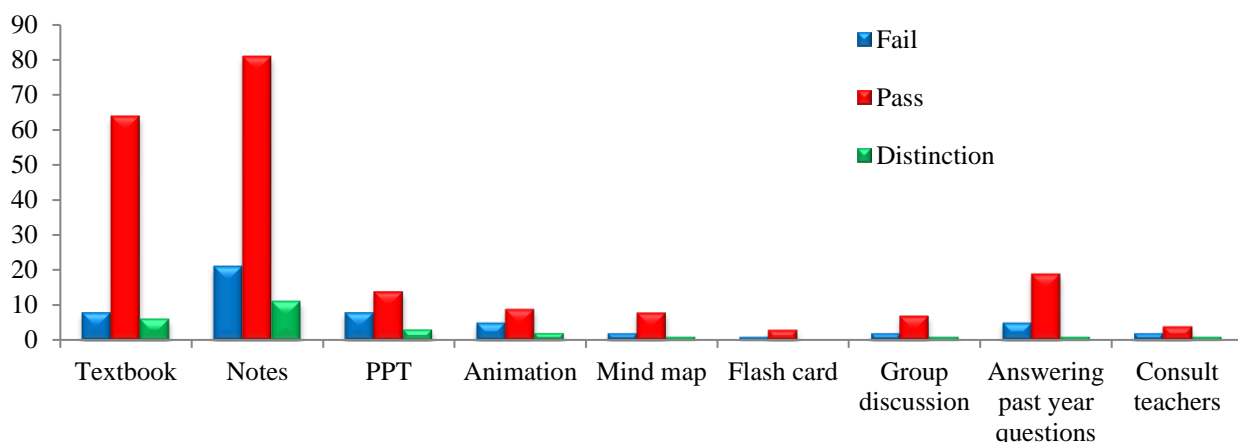


Fig. 1: Mode of revision by students

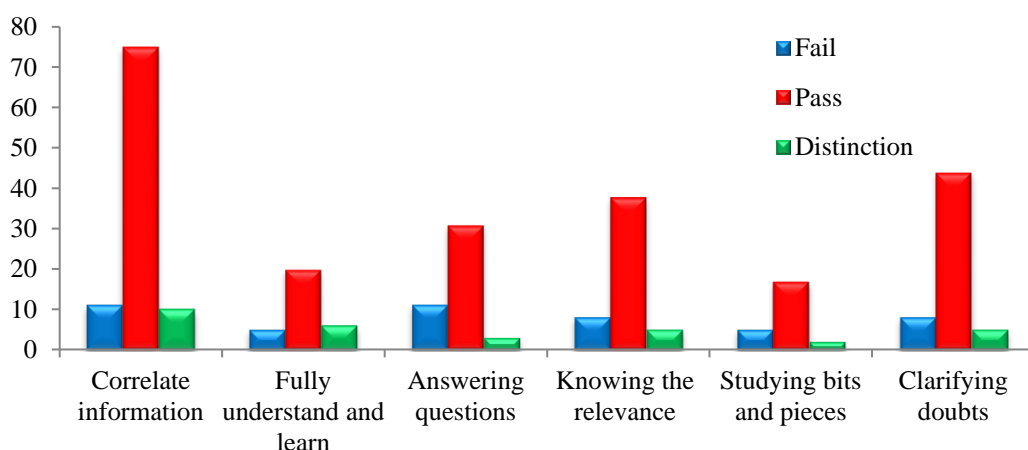


Fig. 2: Study approaches adopted by students

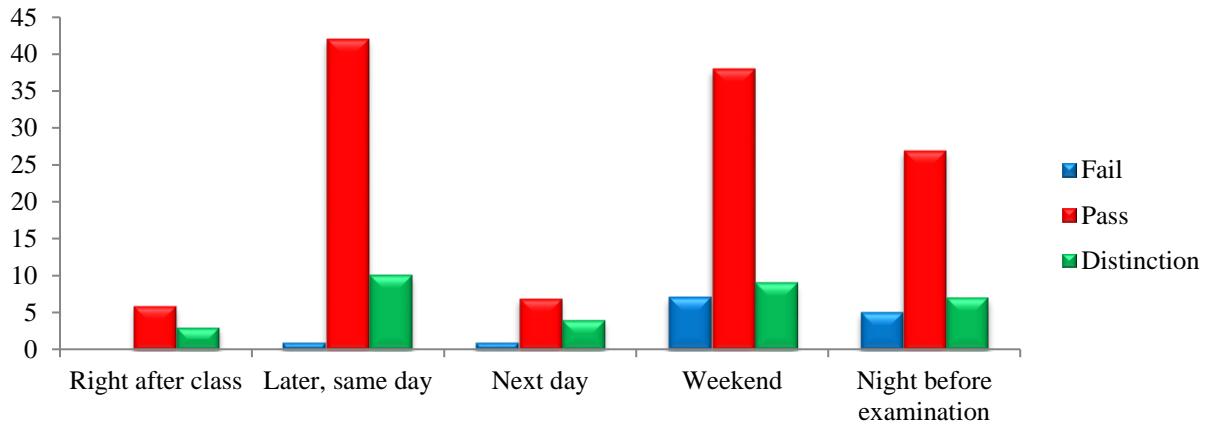


Fig. 3: The time to review new information learnt by the students

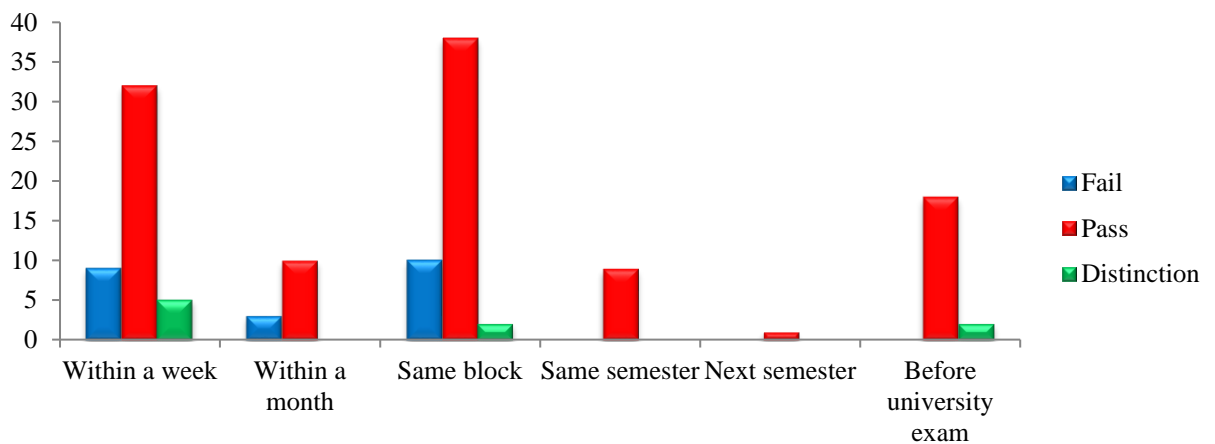


Fig. 4: Time to recall information reviewed

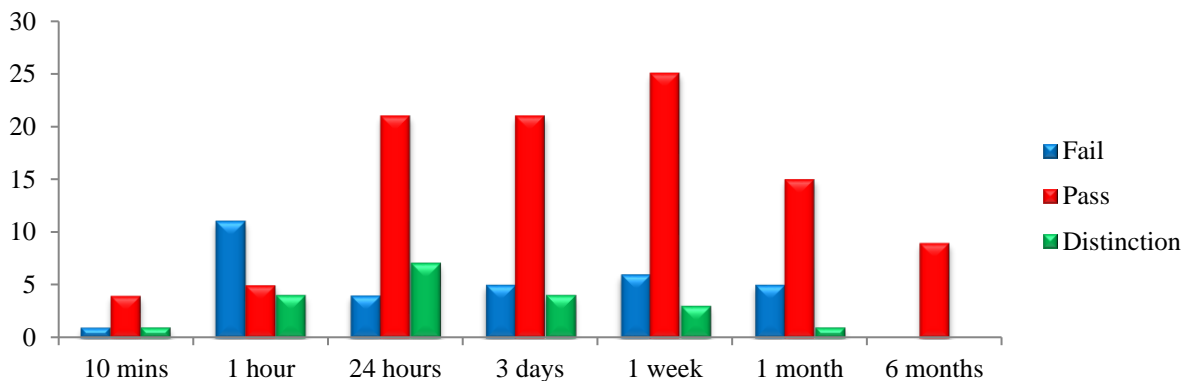


Fig. 5: Retention of information reviewed by student

Discussion

Based on the investigation done, there is a strong correlation between study techniques used and academic performances of students. Our findings reinforces the above statement where we show that even though all three categories of student have been exposed to the same teaching patterns, but the approach

to studying, recalling and retaining information are different, resulting in obtaining different grades.

According to our study, it can be concluded that the best study method used by high performers is spaced learning.⁽⁶⁾ Way back in 1964, Reynolds & Glaser⁽⁷⁾ studied the effects of repetition and spaced review upon retention of a complex learning task and their results indicated that "variations in repetition had

only transitory effects upon retention, but that spaced review produced a significant facilitation in retention of the reviewed material." Studies by Kelley and Watson in 2013 obtained results that indicating that long-term memories of an academic course can be created rapidly through "Spaced Learning". Their results showed that, experimental subjects acquired long-term memories of complex material, apparently adjusting easily to Spaced Learning's very intense learning and exceptional speed of delivery of the Biology courses. Students enrolled in their study were very positive, asserting Spaced Learning helped them learn rapidly.⁽⁸⁾

Most of the students use linear notes followed by reading text books and computerized notes. The students also agreed on linking what have been learned with what they already known as their preferred study approach apart from knowing the importance of finding the reasons behind things and looking up things that they do not understand.

From the results, it is proven that medical students tend to forget the information they acquired within one day. But, this weakness is overcome by "pass" and "distinction" students through immediate and constant effort in reviewing the new information for the first time on the same day and later in the same block. However, the "fail" category students usually take a longer time to revise which is in the weekend. This somehow might contribute to their academic performance either in block or university examination.

For students in a medical college, it sounds unrealistic to review everything they learn several times because of time limitation and are being constantly bombarded with new, competing information. Our study shows that waiting a week before doing the first review would mean the student now has to do much longer review – versus a quick review the next day. In addition the time required for each review also will decrease with each interval. For example a learner may require 15 minutes of review the first time, 10 minutes of review for second time, so on and so forth. These show that, this study technique actually saving more time thus solving the problem of limited time claimed by most of the high performers. Finally, this study concludes that understanding the dynamics of this memory recall technique is very useful for learner not only as a student, but throughout the career as a doctor to acquire and retain information.

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Conflict of interest

No potential conflict of interest relevant to this article was reported.

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References

1. Green, C. S., & Bavelier, D. (2008). Exercising Your Brain: A Review of Human Brain Plasticity and Training-Induced Learning. *Psychology and Aging*, 23(4), 692–701. <http://doi.org/10.1037/a0014345>.
2. Nouchi, R., Taki, Y., Takeuchi, H., Hashizume, H., Nozawa, T., Kambara, T., Kawashima, R. (2013). Brain Training Game Boosts Executive Functions, Working Memory and Processing Speed in the Young Adults: A Randomized Controlled Trial. *PLoS ONE*, 8(2), e55518. <http://doi.org/10.1371/journal.pone.0055518>.
3. Titz, C., & Karbach, J. (2014). Working memory and executive functions: effects of training on academic achievement. *Psychological research*, 78(6), 852-868. <http://doi.org/10.1007/s00426-013-0537-1>.
4. <https://danspira.com/2008/07/24/learning-the-forgetting-curve/>. Accessed on 5 Aug 2017.
5. Subramaniam, B., Hande, S., & Komattil, R. (2013). Attendance and Achievement in Medicine: Investigating the Impact of Attendance Policies on Academic Performance of Medical Students. *Annals of Medical and Health Sciences Research*, 3(2), 202–205. <http://doi.org/10.4103/2141-9248.113662>.
6. <http://knowledgeplus.nejm.org/spaced-repetition-the-most-effective-way-to-learn/>. Accessed on 29 Nov 2016.
7. Reynolds, J. H., & Glaser, R. (1964). Effects of repetition and spaced review upon retention of a complex learning task. *Journal of Educational Psychology*, 55(5), 297-308. <http://dx.doi.org/10.1037/h0040734>.
8. Kelley, P., & Watson, T. (2013). Making long-term memories in minutes: a spaced learning pattern from memory research in education. *Frontiers in Human Neuroscience*, 7, 589. <http://doi.org/10.3389/fnhum.2013.00589>.