

Too Much Focus Leads to Success or Stress?

Dr. Anuja Kamat, Wentworth Institute of Technology

Anuja Kamat is an Associate Professor in the Civil Engineering Department at Wentworth Institute of Technology, Boston. Prof. Kamat received her Ph.D. in Civil Engineering from the University of Arizona, Tucson and MS in Civil Engineering from the Univ

Dr. Tugba Arsava

My background includes both structural and transportation engineering expertise of civil engineering. I am particularly interested in projects on engineering systems analysis, structural analysis, civil engineering materials, system optimizations, traffic

Improving Academic Success with Distraction Method

Abstract:

Thinking capabilities can be affected significantly (negatively) with excessive focus exhaust. It is particularly important to make sure your brain is not exhausted and not losing its thinking capabilities. It has been found that both focus, and un-focus are vital for efficiency, thinking, and learning. When the brain is unfocused, it uses the energy to activate old memories, goes back and forth between past, present, and future, and reinforces imaginative and creative thinking [1].

A study conducted at the University of British Columbia [2] suggests that people who are struggling to solve complex problems might switch off to simple and short tasks. This switch will distract their brains and reinforce their thinking capabilities.

To improve students' success and their thinking capabilities, we applied the proposed strategy. During exams, in addition to the course-related test questions, irrelevant logic questions were asked. The main objective was to un-focus their thinking and prevent excessive focus exhaust before they give up during the exams and improve their success rate.

The students were divided into two different test groups. The first group of students was the control group, and this group received the test with only course-related questions. The second group of students was the experimental group, and this group received the test with course-related questions and irrelevant logic questions. Both groups received the same course-related questions. The experimental group, who received the mixed test, had a chance to un-focus their brain from overthinking, refresh their mind and go back and solve the test.

This experiment was implemented for multiple courses including theoretical courses as well as problem-solving courses, both for lower-level classes as well as upper-level classes in engineering. Consistent with the research, the success rate of the group which had a chance to un-focus was found greater than the control group.

Keywords: academic success, distraction method, focus, un-focus, improved thinking.

Introduction

Stress is one of the main parameters that have a negative impact on students' success and learning capabilities. The source of stress can be anything. It can be the learning environment, course materials, exams, or daily activities. To improve student learning capabilities, causes of stress should be minimized, the source of the stress should be analyzed, or students should gain some capabilities to manage it.

To manage stress and anxiety, in different areas, distraction methods are widely adopted and used with variant success rates. The distraction method is a technique that a person engages in to redirect the mind off from current activity or emotion. If a person feels stressed, with this technique, they can redirect the mind from stress and help to refresh the mood. Rather than putting all the energy into the stressful activity, attention can be shifted, and stress can be dissipated. For example, music distraction is used to reduce anxiety in pediatric dental patients [3]. Distraction is used for pain management during painful cancer treatments [4]. This method is also used for job stress management and success [5].

In this research distraction method is applied to improve the academic success of the students. In the following sections used distraction method is defined and results are presented.

Case Study

In the author's university, Wentworth Institute of Technology, Boston, Civil Engineering Materials is a spring semester sophomore-level class. This is a small private university and this class had 48 students. The class is highly theoretical and has a lot of concepts that need to be understood. The students have quizzes and take these quizzes on the learning management system, Brightspace. The quizzes typically have 20-30 multiple-choice or true/ false questions. In the quiz, only one question is presented to the student at a time. When the student answers the question, they can go to the next question.

In previous years, the authors had observed that the students seemed to perform well in the initial part of the quiz and did not perform well in the questions in the later part. It was an interesting observation, which led the authors to think that it was likely because the questions followed the order of the textbook. The authors thought that maybe the students studied the initial part better and did not study the later part as well.

However, after randomizing the questions, there still seemed to be the same pattern. Looking at the literature cited above, the authors did an experimental pilot study in a different course, Highway Engineering. All the students were given distracting questions in the final exam. The results of the final were considerably better than the mid-semester exams.

Observing the results, the authors thought about this study for the Civil Engineering Materials course. In this study, the distraction method is used to improve the academic success of the students.

For the purpose of this study, two different student groups were prepared – Group 1 and Group 2. All the students were in the class with the same teacher and had access to the same lecture materials and homework in both groups.

The success of the method was evaluated with different tests. In total three different tests were given to students. In each test, two different test types were prepared. In test type 1, only lecture-related questions were asked to the students. In test type 2, in addition to lecture-related questions, distraction questions were included. These questions were selected randomly and did not have any course-related content.

The students were aware that they might get unrelated questions and that these would not affect their grades. They were told that they should read and answer the questions, but not spend too much time on any questions because the question might just be silly and not have a correct answer. The students knew that the silly (distraction) questions were part of an educational study.

The first group of students (Group 1) received test type 1, and the second group of students (Group 2) received test type 2. In total 3 different tests were given and at each test, test types were switched. For instance, in the first test, student group 1 got the test type 1 questions, in the second test, the same group (student group 1) got test type 2 questions. Before the start of the quiz, all students were told that they might see some questions in the quiz that are not related to the course content (distraction questions). We would like them to solve the questions. The students were also told that they are not graded questions. A summary of the structure is presented in Figure 1.

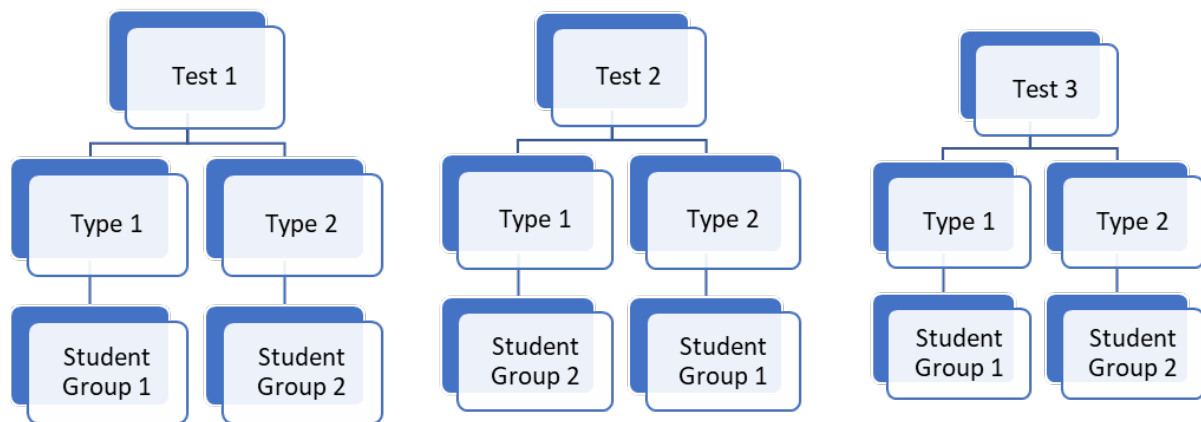


Figure 1 Structure of academic distraction method test

Details of Individual tests and Examples of distraction questions:

In test 1, there were 22 curriculum questions (1 point each) and the type 2 group received 3 additional questions as given below.

1. A monkey, a squirrel, and a bird are racing to the top of a coconut tree. Who will get the banana first, the monkey, the squirrel, or the bird?
 A. Monkey B. Bird C. Squirrel *D. None

*None, because there are no bananas on a coconut tree.

2. If I say "Everything I tell you is a lie", am I telling you the truth or a lie?
A. Truth *B. Lie C. It can be the truth or a lie D. Not enough information
3. What has 13 hearts but no other organs?
A. Human *B. Game C. Animal D. Not enough information

The answer would be a game of playing cards.

The purpose of the distractions was to bring a smile on the face of the students and get them to think about something other than the curriculum. The student has to read the question before realizing that this is a silly question. At that point, the student could choose to randomly answer the question. Getting a correct answer was never the purpose of this study. The purpose is to unfocus from the Civil Engineering Materials questions to reduce stress. This is achieved regardless of the correctness of the answer to the ungraded silly (distraction) question.

In test 2, there were 25 questions (1 point each) and 2 additional distraction questions for those in type 2. As can be seen in Fig. 1, the students in the type 1 and type 2 groups were switched in test 2 compared to test 1. The distraction questions were similar to test 1 and are given below.

1. If an electric train is traveling south, which way is the smoke going? A. East
B. North *C. None of these D. South
*An electric train does not have smoke.
2. A man says, "Brothers and sisters, have I none, but that man's father is my father's son. Whom is he pointing at?
A. None of these B. cousin *C. son D. daughter

In test 3, there were 23 questions (1 point each) and the type 2 group received 1 additional distraction question. The group that was assigned the distraction question was similar to the test. There was one difference in the distraction question. In this test, the distraction question was mathematical instead of theoretical. The distraction question asked is given below:

1. There are 12 kids in a classroom. 6 kids are wearing socks and 4 are wearing shoes. 3 kids are wearing both. How many are bare feet?
A. None of the above B. 7 kids are bare feet
*C. 5 kids are bare feet D. kids are bare feet

After the quizzes, the students were asked what they thought about the questions and they had no strong feelings. They were told that the questions were a part of the study to help us become

better teachers and find ways to help them learn better. The students said that getting distraction questions did not affect them in any way.

Results and Analysis:

Three different quizzes were given to students. For each quiz, two different types of quizzes were made, type 1 and type 2. Type 1 test just included course-related questions and type 2 test included both lecture-related and distraction questions.

Consistent with other studies, it was seen that the distraction method improved academic success. The results of each test are presented in Figure 2 and Table 1.

In addition to Figure 1 and Table 2, the improvement of the success rate is also analyzed. The success improvement rate is observed as 3.3% for test 1, 6.6% for test 2, and 20.7% for test 3. In test 1 type 2, in total 3 distraction questions were asked. In test 2 type 2, in total 2 distraction questions were asked and in test 3 type 2, in total, just 1 distraction question was asked.

With respect to the results, it is seen that the impact of the distraction method is also affected by the distraction amount. Including more distraction questions, reduces the effectiveness (Figure 3). Also, numerical distraction might be more effective in a theoretical course.

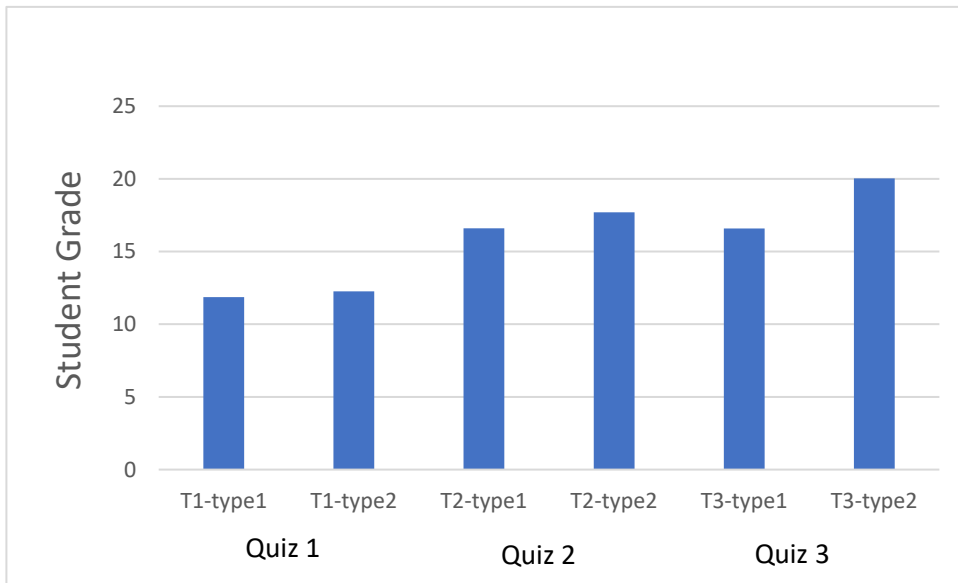


Figure 2 Test results (Type of questions vs student grade average)

Table 1 Test results

	T1-type 1	T1-type 2	T2-type 1	T2-type 2	T3-type 3	T3-type 2
Average	11.87	12.26	16.60	17.70	16.59	20.03
Std.Deviation	4.80	3.18	2.14	3.29	2.85	2.70
provement rate (%)	3.3		6.6		20.7	

Statistical Analysis:

The one-tail test gives a p-value of 0.108 (10.8%), which is more than 0.10 (10%). This means the p-value indicates that there is little evidence against the null hypothesis being invalid. The null hypothesis in this case holds true. The ‘Null hypothesis’ of there being a relation between the type 1 and type 2 scores stands valid (and the alternative hypothesis fails). The two-tailed test gives a p-value of 0.292 (29.2%), which is much more than the p-value above and 0.10 (10%). This serves as strong evidence that the null hypothesis is true.

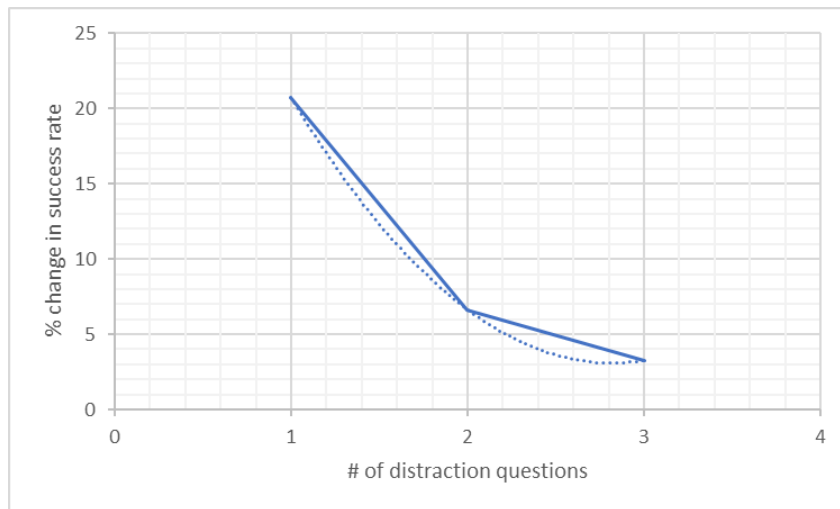


Figure 3 Change in success rate vs number of distraction questions

Conclusion and Recommendations:

The distraction method was adopted into student exams, and it was found that redirecting the mind off from the current activity improved student success. To maximize the efficiency of this method, optimization studies should be conducted in the future which should define the optimum number of distraction questions based on the length of the exam, test duration, total number of course-related questions, and question types (such as verbal, numerical, true/false, etc.).

References

1. Sirini Pillay, " Your Brain Can Only Take So Much Focus" Harvard Business Review, May 2017.
2. University of British Columbia. "Brain's Problem-solving Function At Work When We Daydream." ScienceDaily. ScienceDaily, 12 May 2009.
<www.sciencedaily.com/releases/2009/05/090511180702.htm>.
3. N. Marwah, AR Prabhakar, OS Raju. Music Distraction and its efficacy in management of anxious pediatric dental patients. Journal of Indian Society of Pedodontics and Preventive Dentistry. Year 2005, Vol. 23, Issue 4, Pages 168-170.
4. M. Broome, P. Lillis, T. W. McGahee and T. Bates. The use of distraction and imaginary with children during painful procedures. European Journal of Cancer Care A multidisciplinary journal for cancer research from prevention to palliation. March 1994, Vol3 Issue1.
5. A. Shimazu and W. B. Schaufeli. Does Distraction Facilitate Problem-Focused Coping with Job Stress? A 1-year longitudinal Study. Journal of Behavioral Medicine, 2007, 423- 434.