

New Jersey City University
Educational Technology Department

Memorandum

TO: Dr. Amerman, Professor

FROM: Patricia Denis, Doctoral Student

DATE: August 20, 2023

SUBJECT: Students' Gamification Grades

The data within this memorandum is an analysis of students who used a gamified learning application (interactive flashcards and badges) to learn about statistics and multidimensional statistical analysis. The two variables presented in the data are students who used the application (users) and those who did not use the application (nonusers). The data and attached visuals (appendices) provide the total number of practice quizzes and final examinations by user versus non-user, as well as average quiz grades for unlimited quiz attempts.

Appendix A includes the practice exam grades of students (both users and non-users) before and after using the educational platform. The average practice score for platform users before using the application is 5.6 out of 10, compared with .30 out of 10. The final scores between the two variables of students concurred that those who used the application scored higher than those who did, regardless of using the gamified material, with platform users' scores being 7.35 out of 10 and nonusers scoring 6.25 out of 10. The difference in score between the

final exam grades after users (1.75) and nonusers (2.95) of the platform shows that the nonusers had a higher average score increase.

Appendix B displays the correlation between the number of quizzes on the gamification platform and students' test scores. Those who did not use the quiz averages for final scores were the lowest, 6.25 out of 10. An interesting phenomenon within the data is that users who use the platform, on average, score higher than those who use it between three and six times. These data further demonstrate that there is no direct correlation between test score improvements and the usage of the gamified learning application.

Appendix C further explores the average quiz grades based on the quiz attempts made by the students. The data from the quiz grades reflected that students showed growth each time they took the quiz. The data in Table 2 of the Appendix B show that the increase in quiz grades resulting from the number of attempts does not translate to an increase in final exam scores. A hypothesis can be made that students who use the platform repeatedly find a pattern to answer questions correctly.

The data used in this study were retrieved from the Kaggle database during a search for "gamification in learning." The data suggest that a gamified learning application (interactive flashcards and badges) can be an extra study supplement to assist with learning different materials. The data does not show an exact correlation between using the gamification application and increased students' test scores.

Please feel free to contact me with any questions or concerns regarding the presented data via email at pdennis@njcu.edu

Attachments:

Appendix A: Users and Nonusers' Average of Practice and Final Exam Scores

Appendix B: Quiz Attempts v Final Exam Grade

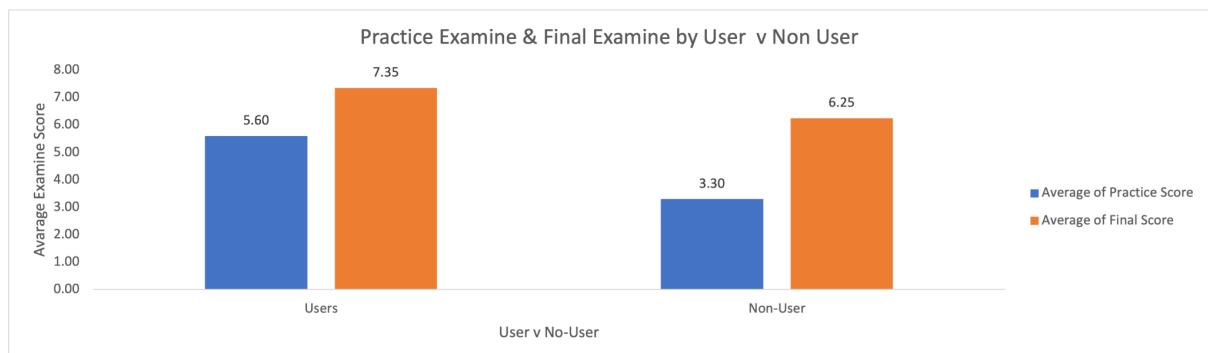
Appendix C: Quiz Attempts v Average Quiz Grade

Appendix A:

Users' and Nonusers' Average of Practice and Final Exam Scores

Table 1

Students	Average of Practice Score	Average of Final Score	Difference in Score
Users	5.60	7.35	1.75
Non-User	3.30	6.25	2.95

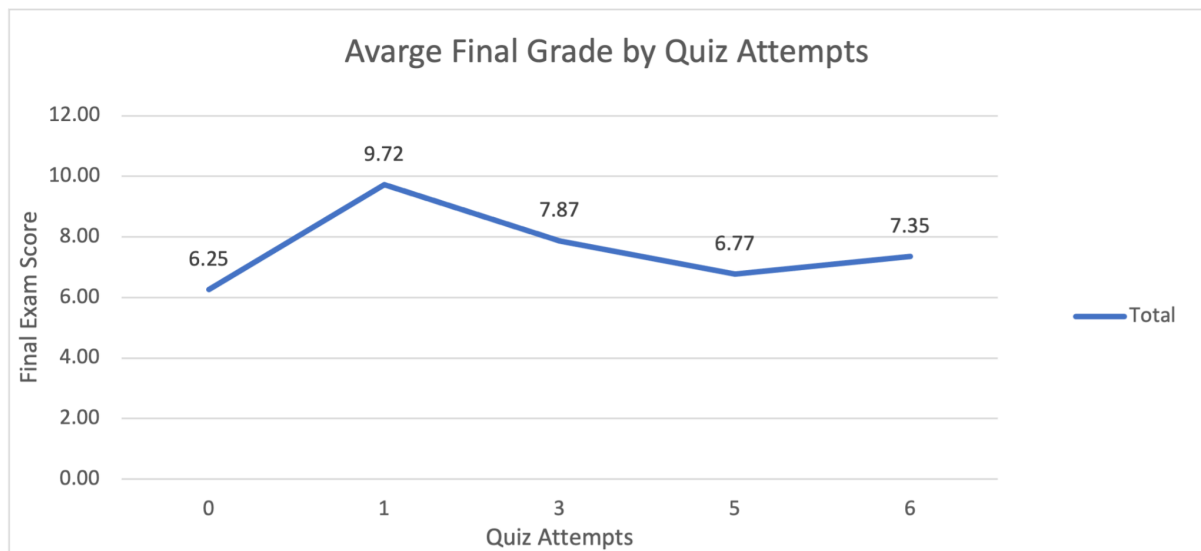


Appendix B:

Quiz Attempts vs. Final Exam Grade

Table 2

Quizzes are taken on the platform	Average of Final_Exam
0	6.25
1	9.72
3	7.87
5	6.77
6	7.35

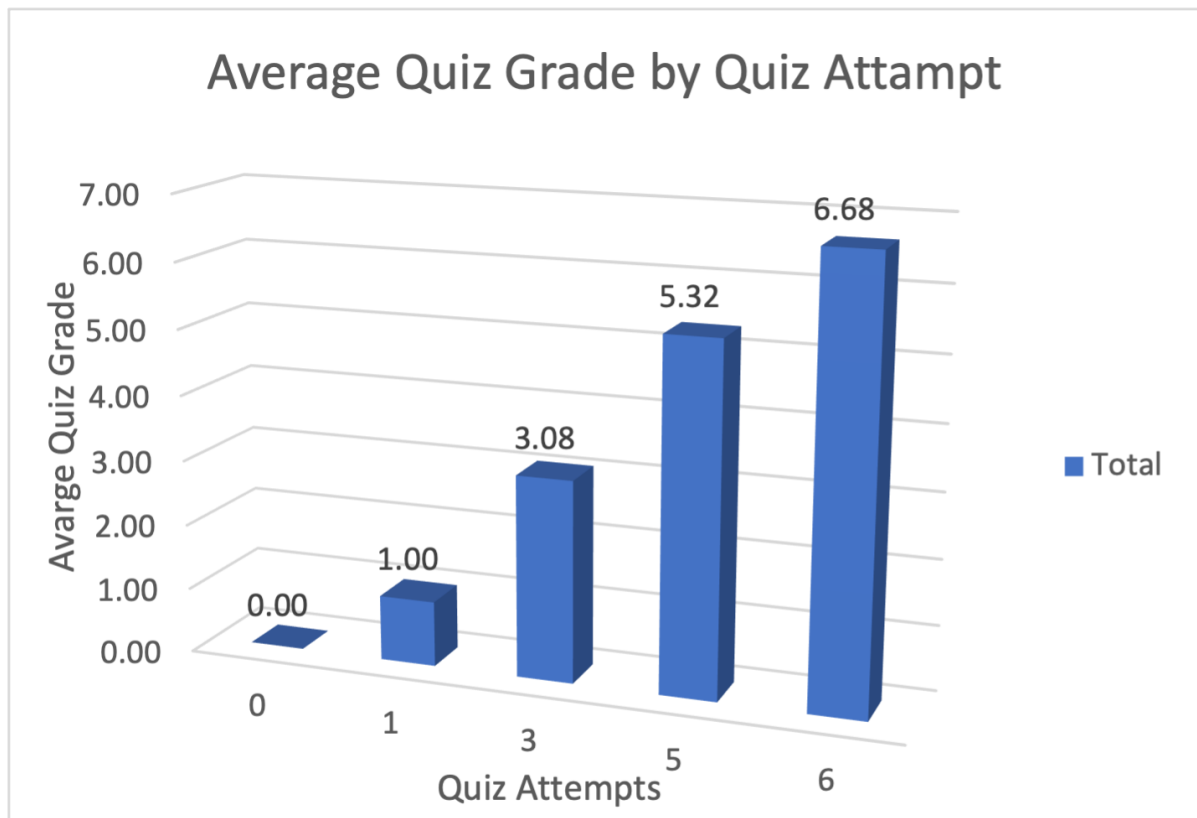


Appendix C:

Quiz Attempts v Average Quiz Grade

Table 3

Quiz Attempts	Average Quiz grade
0	0.00
1	1.00
3	3.08
5	5.32
6	6.68



References

PETRAȘCU, G.-M. (2023). *Gamification in education*. Kaggle. Retrieved August 20, 2023, from
<https://www.kaggle.com/datasets/gianinamariapetrascu/gamification-students-grades>