What about cheatsheets are useful?

FirstName Surname
Department Name
Institution/University Name
City State Country
email@email.com

FirstName Surname
Department Name
Institution/University Name
City State Country
email@email.com

FirstName Surname
Department Name
Institution/University Name
City State Country
email@email.com

ABSTRACT

College instructors often allow students some form of cheatsheet during an exam, such as one page of notes and formulas. Many believe these reduce test anxiety and help students to do better on exams. Focusing on the latter, we found, in a study of two different types of computer science courses, that features we might have believed would help students, do not actually have any correlation with performance. Coupled with mixed results from the literature, we are still left with the agonizing question: what about cheatsheets are useful?

ACM Reference Format:
Anon Author 1, Anon Author 2, and Anon Author 3. 2025. What About Cheatsheets Are Useful?. In *Proceedings of The Technical Symposium on Computer Science Education (SIGCSE'26)*. ACM, New York, NY, USA, 2 pages. https://doi.org/10.1145/nnnnnnn.nnnnnnn

Introduction

Researchers have examined mixed results in terms of the effects of cheatsheets in academic settings. Dickson & Miller [1] and Hamouda & Shaffer [2] noted that cheatsheet features and exam results have little in common, especially in terms of questions that require student comprehension and analysis. This contradicts Özer [3], who found that higher quality cheatsheets correlated with increased exam performance. Moreover, Gharib et al. [4] discovered that cheatsheets have some passive benefits, helping to reduce test anxiety for students. Given these mixed findings, we target the relationship between features of cheatsheets and student exam performance in computer science courses.

Methodology

We analyzed over 400 cheatsheets and student exams scores from two different types of computer science courses: an introductory CS1 level course and an upper division course on Automata Theory. CS1 had 39 collected cheatsheets for the final exam, and Automata Theory had over 100 cheatsheets for its four different exams. Every cheatsheet was anonymized before examination.

For each cheatsheet, we manually scored the content on each sheet based on topic coverage. Specifically, we mapped each sheet to topic categories that were covered by the exam, scoring the category as yes or no, 1 or 0, if the sheet covered the topic in some way. We went through each exam manually, recording all relevant covered topics.

For example, one exam had a question about the Pumping Lemma. Each sheet would receive a 1 for that topic category if they wrote about the Pumping Lemma. They received a zero otherwise.

For the CS1 exam, students were additionally given a sample cheatsheet, which contained some, though not all, of the topics that would be covered on the exam. We tracked separately any performance based specifically on those given topics versus all possible topics.

Results

We saw no correlation between the number of topic categories (sum of scores) that were covered and performance on the exams. Figure 1 shows linear regression fits for exams with all cheatsheet factors or with only the provided topics, respectively, an R^2 of 0.036 and 0.006, which indicates no statistical relationship between the cheatsheet quality and exam performance.

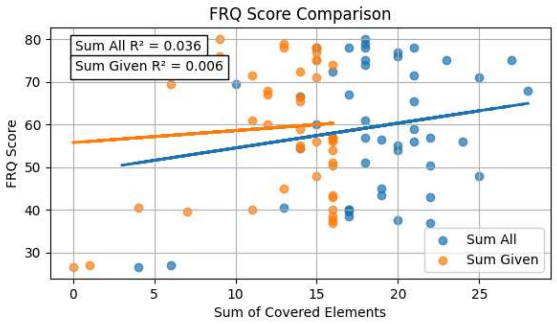

Figure 1: No statistical relationship for CS1 free responses

The same was true of free response and multiple choice questions, as shown in Figure 2 (R^2 0.028 and 0.004, resp.)

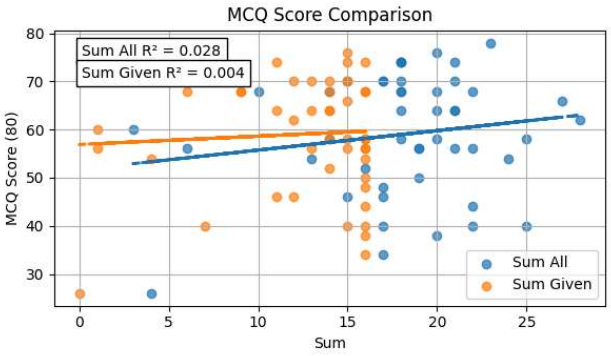

Figure 2: No statistical relationship for CS1 multiple choice

Quality can be measured in other ways besides topic coverage. So we also looked at the most relevant factors, which are topics that directly appeared on the exam verbatim from lecture materials. We assume that if a student were to have this question on their cheatsheet and see it on the exam, they should get it correct. Observing these specific factors yielded no statistical significance (R^2 0.073), indicating that including these specific factors on the cheatsheet may have helped in some way, but the variance is explained by the evaluation and analysis questions dispersed throughout the rest of the exam.

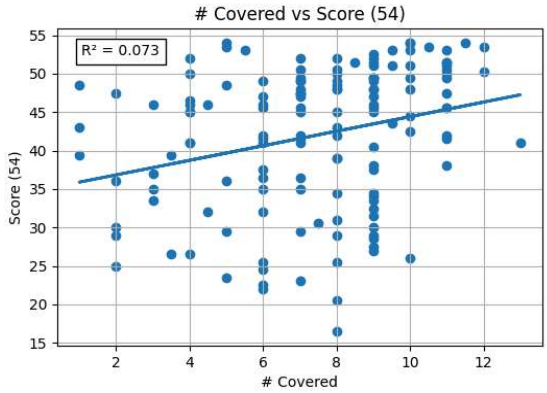

Figure 3: No statistical relationship for Automata course

Given the large number of cheatsheets in the Automata Theory course, we also explored a number of other factors, too many to discuss in this short format. Perhaps there were certain other best practices that were more common among high performers than others? One example was looking specifically digitally mastered cheatsheets versus hand written ones. Students were instructed to handwrite their cheatsheet, which included both paper and tablet usage. Though most students did this, some also had predominantly typed cheatsheets. Did this somehow diminish utility? No. We saw no difference, as shown in Figure 4.

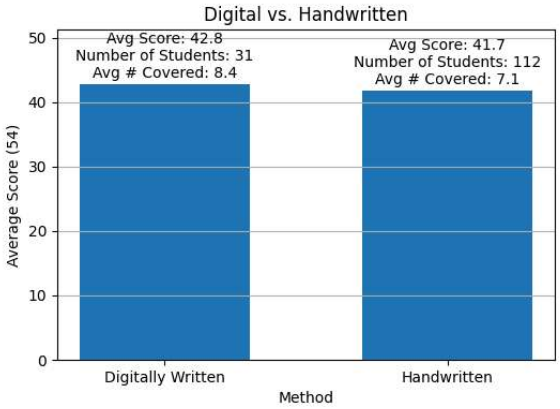

Figure 4: No difference in digitally/handwritten cheatsheets

Other features (not elaborated here due to limited space) included, for example, relative font size, total density as in ink per square inch, and a number of other factors that were noted as highly variable between students. None of them showed any relationship to performance.

Discussion

The literature on whether cheatsheets are helpful for students, when it comes to performance, gives us mixed signals. We do believe that *creating* cheatsheets is beneficial, but our findings seem to indicate that the content of cheatsheets themselves do not affect exam performance at all, which agrees with Dickson & Miller [1] and Hamouda & Shaffer [2]. Whether or not cheatsheets provide other important psychological benefits is a different story.

We believe more work needs to be done to understand their actual benefits. We would also like to see more research that identifies specific features or factors that make certain cheatsheets better than others, which we thought was an important aspect of our investigation in this study. If cheatsheets in fact do benefit students, it motivates us to train them to make better ones. Or, if there are only beneficial effects due to psychology or simply the time spent studying, then we should focus more attention on training students to make effective use of study groups when producing cheatsheets.

REFERENCES

[1] Dickson, K. L., & Miller, M. D. (2005). Authorized Crib Cards Do Not Improve Exam Performance. Teaching of Psychology, 32(4), 230-233. https://doi.org/10.1207/s15328023top3204_6

[2] Hamouda, S. & Shaffer, C. (2016). Crib sheets and exam performance in a data structures course. Computer Science Education. 26. 1-26. https://doi.org/10.1080/08993408.2016.1140427

[3] Özer, S. (2021). A convergent parallel mixed-method research into the use of the cheat sheet in teacher education: State test anxiety, exam scores and opinions of prospective teachers. Turkish Online Journal of Educational Technology. 20. 101-113.

[4] Gharib, A., Phillips, W., & Mathew, N. (2012). Cheat Sheet or Open-Book? A Comparison of the Effects of Exam Types on Performance, Retention, and Anxiety. Journal of Psychology Research, *2*(8), 479–488. https://doi.org/10.17265/2159-5542/2012.08.004