

The Case Against the Use of Solution Manuals



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Ask any student, and they'll likely make some of the following arguments in favor of the use of illicitly obtained solution manuals:

- *Everyone uses solution manuals. I have to do it just to level the playing field.*
- *You can Google "solution manual" and come up with lots of hits. What's wrong with using freely available documents?*
- *Students who rely too heavily on solution manuals will do poorly on the exam, so it evens out in the long run.*
- *If the objective of education is to learn the material, then I should be able to use any tool available to improve my personal performance.*
- *I only use it when I really need it—when I'm stuck the night before homework is due and need to figure out how to get started.*
- *If professors are lazy enough to assign problems from the textbook every semester, it serves them right when students use solution manuals to gain an advantage.*

A recent study highlights the mismatch between the views of faculty and students on this topic; 77% of faculty vs. 11% of students view the use of solution manuals as cheating.^[1] Another study confirms that the percentage of students who are unsuccessful in a course rises when students have access to solution manuals, refuting the argument that solution manuals improve student learning.^[2] Addressing academic integrity issues can be painful, however, and many faculty would rather avoid dealing with a form of cheating that has gained widespread student acceptance.

One recommended approach is for faculty to set clear expectations about use of solution manuals to complete graded homework.^[1] My department has decided to include the following statement within the Academic Integrity section of all course syllabi:

The use of a solution manual or equivalent (e.g., solutions posted to the web or from previous class offerings) in the preparation or submission of homework will be considered cheating and dealt with accordingly.

Solution manual copying is typically detected when a stu-

dent transcribes a solution verbatim, especially if it contains an error; when a narrative response is copied word for word; or when there is significant overlap between the sequence of operations or equations in a long, complex problem. Our typical penalty for students found responsible for using illicitly obtained solution manuals is a zero on the homework portion of the student's grade, since all of their homework becomes suspect once they are known to have access to an off-limits resource. Other approaches to mitigate the use of solution manuals include assigning original projects or open-ended homework problems, writing original problems (or using problems from other texts), or using online homework systems provided by textbook publishers.

Whatever approach we decide to take, we cannot ignore the issue. When faculty look the other way or implicitly condone the use of solution manuals, we send a message about the culture of the department with regard to integrity—that shortcuts are winked at, that students have to fend for themselves to level the playing field, that the ends justify the means. Patterns of behavior that are formed in college become accepted behavior in the workplace (and life in general); the headlines confirm that there are ample opportunities to take shortcuts in the business and regulatory arenas. Chemical engineers are responsible for the health, safety, and welfare of their co-workers and their community, and the consequences of taking a shortcut or fudging the facts can be devastating. Students need to learn how to take the harder road of self discipline that leads to authentic learning and accomplishment. Setting clear expectations and holding students accountable for unethical behavior will make its occurrence less likely after graduation, when the potential consequences of integrity violations are much more severe.

REFERENCES

1. Minechiello, A., L. McNeill, and C. Hailey, "Comparing Engineering Student Use of Solution Manuals and Student/Faculty Perceptions of Academic Dishonesty," ASEE Proceedings (2012)
2. Karimi, A., and R. Manteufel, "Does Student Access to Solution Manual Pose a Challenge?," ASEE Proceedings (2011) □