

Engineering 0011/0711 Assignment #4 Further Information and Advice

A revision such as the one you are doing for Assignment #4 requires that you *add* information and that you *rewrite* so that the new information is logically integrated into a *complete* paper. For Paper #2, you wrote about a Grand Challenge, providing readers with a description of that Challenge and with an evaluation of the significance of that Challenge. Paper #2 was a paper “about” a Grand Challenge and its importance to society and to engineering.

Paper #4 is “about” a Grand Challenge, the significant relationship between engineering ethics and that Challenge, and the significance of this Challenge and related ethical issues to a freshman engineering education. As was necessary in Paper #2, you must, in Paper #4, describe the Challenge. But, in Paper #2, you were not *only* reporting on the Challenge; you were evaluating the importance of that Challenge. In Paper #4, you are not *only* reporting on the same Challenge, you are assessing the Challenge in the light of engineering ethics, and you are assessing the value of such a study in a freshman engineering curriculum.

You might think of your Paper #2 as a very significant resource for Paper #4. Paper #2 contains valuable descriptions, explanations, statistics, and data. You will be using that information in Paper #4. In some cases, you may be using some of that that information “intact.” There may be passages—especially passages in which you are describing the Challenge and related data and technologies—that will appear in Paper #4 exactly as they appear in Paper #2.

While you might think of Paper #2 as a resource, there may have been areas of Paper #2 that, “as is,” would not provide useful, effective resource information. There may be weaknesses in descriptions and explanations, and/or missing statistics and data. You may need to add to your Paper #2 descriptions and explanations of your chosen Challenge in order to *fully* portray the Challenge. If parts of Paper #2 were not clear and complete, you will not want to include these passages or that information in Paper #4 *unless and until* all descriptions are complete and all explanations are clear.

Even if you had a very high grade on Paper #2—all descriptions, explanations, evaluations were clear and complete—doing nothing else with the paper other than adding on a section about ethics and a section about education would *not result in an effective Paper #4*. Why not? Because the paper would appear as two somewhat separate papers: one on a Grand Challenge and its impact on society and on engineering and one on engineering ethics and education. Readers would be asking, “why does this paper’s author discuss social value on page 1, then wait until halfway through page 2 to bring up ethics? Aren’t ethics important to the social value of the author’s chosen Grand Challenge? Why did the author “tack on” an assessment of educational value near the very end of the paper? Aren’t issues related to engineering education relevant to the NAE’s decision to spend time and resources on delineating and publicizing 14 Grand Challenges?” You don’t want readers puzzling over such questions after reading your paper. You do want to show, from your introduction onward, the **relationships** among your Grand Challenge and engineering ethics and the **value** of the study of a Grand Challenge + engineering ethics in a freshman engineering curriculum.

In Paper #3, many of you wrote about how much you enjoyed creating structures out of Legos or K’Nex. Imagine Paper #2 as a structure you built with a given number of Legos. For Paper #4, you now have some new Legos. You are going to build a new structure that incorporates design and structural elements of your first structure. You now have a chance to enhance the original design and structural elements—to rearrange and reinforce so weaknesses in your original structure are resolved, and you can now add in new Legos that will allow for new values and uses. For your new structure (Paper #4), you use most, maybe all of the Legos you initially used, but you do not simply use the new Legos to build on a bland tower or purposeless linear addition.

Many of you are interested in and good at rebuilding and refining motors engines or entire vehicles. Imagine Paper #2 as a set of engine parts you have from a particular vehicle. You are now cleaning up and retooling those parts towards building an engine to use in another vehicle. This new vehicle (Paper #4) has some of the same requirements as the vehicle the parts originally came from, but this new vehicle also has its own, new and different requirements and specs. . What will you need to add to those parts you have to meet these new requirements and specs? Will there be any parts that will be replaced? Again, how will you retool to meet the new vehicle’s requirements?

So: Effective revision = adding + rewriting.

Effective revision = adding + retooling + reassembling

Effective revision = adding + redesigning + rebuilding

Effective revision = debugging + adding + rewriting