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Technical Report: Solving Global Problems [Composition]

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ENG 259 Technical Writing
Technical Report: Solving Global Problems

This assignment was developed as part of a 2018-19 Center for Teaching and Learning (CTL) - sponsored Learning Matters Global Learning Mini-grant awarded to support the ENG 259 Technical Writing course. This course is required for engineering students as the second course in their composition sequence to be taken in lieu of ENG 102. The aim of the mini-grant was to integrate LaGuardia's Global Learning core competency into the ENG 259 course via the development of a high stakes global learning assignment. The assignment was developed during the Fall 2018 CTL Learning Matters Mini-Grant seminar meetings led by Drs. Karen Miller and Christopher Schmidt. Based on comments I received from the seminar meeting leaders as well as my mini-grant mentor, Ms. Cristina Di Meo, I developed the final version of the assignment shown here.

The assignment is designed to meet the Global Learning core competency and the Written Communication ability. It is also designed to meet the ENG 259 Technical Writing course outcomes involving producing a written report that applies effective technical writing practices such as clarity, concision, and correctness and meets the needs of a specific target audience who requires an easy to understand document to become better acquainted with the work that engineers may perform.

The assignment comprises a three-part exploratory technical report investigating a global problem engineers are working to solve. Part I requires the identification of a specific global problem involving where it takes place, why it occurs, whom it affects, and what social, cultural, or political factors might contribute to or exacerbate it. Part II requires discussion of what engineers are doing to solve the problem; and Part III requires analysis of the effectiveness of the solution(s); it also asks students to reflect on how completing the report has enlarged their understanding of the global aspects of engineering work and may have catalyzed new or more enhanced engineering ambitions. The assignment comprises a total of 20% of the final grade since the required draft and final version is each worth up to 10 points.

In Week Two, students were introduced to the assignment. In Week Three and Four, students received instruction on library database research and, respectively, research writing techniques involving effective paraphrasing and summarizing. By Week Five, students identified a topic and research sources and, by Week Six, produced a draft of Part I & Part II of the report. (Since Part III asks students to reflect on the research report in its entirety, it was not required to be submitted in the draft stage.) Students were required to submit their research sources along with their draft that was worth up to 10 points. Students received comments back during Week Eight and began working on completing the final draft, required in Week Twelve. In between Week Eight and Twelve, many students met with me during office hours to get more individualized assistance, which often involved me helping them find additional sources.

Given that many students still faced challenges in the draft stage in terms of finding and utilizing appropriate sources, I am thinking it might be helpful to assign students a mini-paper in Week Four instead of a longer draft in Week Six. The mini-paper could address aspects of Part I & II and only require one or two sources at the most. The shorter paper and fewer required sources could potentially help students to better focus on the quality (instead of quantity) of the writing. Likewise, having a mini-paper due earlier would then allow students to receive feedback from me sooner and help them better manage their time in the upcoming weeks to continue developing their existing work (or, if need be, make significant changes regarding the topic and the sources). Once the mini-papers are submitted and reviewed by me, I would also hold a writing workshop during our next regular class meeting. This way, I can provide any general comments and instructions students need on

conducting and applying research sources; I could also meet with students individually in class so they can ask me questions as needed to help them address whatever concerns I raised in the mini-paper.

Once the final versions of the report were submitted and graded, I could easily discern the characteristics distinguishing the reports receiving a grade of B or higher from those receiving lower grades. Students who were more successful with the report were those who actively engaged with the report activities from Week 2 onward. They were present and participatory in the library sessions, found suitable topics sooner than later, and typically met with me at least twice outside class to learn how to narrow their topics and find appropriate, useful sources. Even if these students could still use more revision on various aspects of their writing, their work generally demonstrated a more exploratory-attitude toward the report and offered specific solutions to the global problems they raised. These students also offered more details in Part III, which asked students to reflect on how completing the report task enhanced or increased their global awareness concerning engineering work. Though the assignment has been piloted in only one full semester to date and will be tweaked further to better facilitate student engagement and success, students' final assignments reiterated the necessity and value of careful, steady scaffolding to research-based writing and inquiry projects.

ENG 259 Technical Writing - Global Learning Assignment

“Improving the lives of the 5 billion people whose main concern is to stay alive by the end of each day on our planet is no longer an option for engineers; it is an obligation.”

-- Dr. Bernard Amadei, *Engineers Without Borders - USA Founder*

Engineers have been providing solutions for the benefit of human civilization from the beginning of time --from creating the wheel to building aqueducts to generating electricity to launching digital communication to creating virtual entertainment and developing technology for use in healthcare, food production, transportation, and space exploration among other things. Yet, despite all these innovations, many of the world’s peoples still suffer egregiously. As we glean from the epigraph above, a successful day for billions of people simply means being alive by the end of the day. But, as Amadei, stresses, engineers *can* intervene in the challenges, small and great, plaguing our world that result from extreme poverty, poor infrastructure, and inadequate food, healthcare, water, and energy sources. *The question you now need to address is how -- how do engineers solve the world’s problems?*

Global Engineering Solutions: Specific Title added here
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Task:

Write an exploratory report discussing a global problem engineers are working to address. A global problem is one that detrimentally impacts people and places in many or specific parts of the world. Examples may include: natural disasters, polluted oceans, contaminated drinking water, unreliable or absent energy sources, and unsafe infrastructure. This semester, we will be closely examining global problems concerning water. Topics you may consider exploring in your report include but are not limited to the following: water safety, water & disease, desalinization efforts, water demand & scarcity, water sustainability, waste water treatment, and water resources management.

Tentative Due dates:

First Draft due Week 6; Final Draft due Week 12

Objectives:

- Produce an easy-to-understand report that meets the target audience’s needs (see below)
- Apply effective research methods to find appropriate, relevant sources concerning a given global problem and the solutions engineers offer to address it
- Apply course instruction concerning effective technical writing practices

Outcomes:

- Become more aware of the global issues affecting people locally, nationally, globally
- Become more ethically self-aware of how one can individually and collectively exercise social responsibility as global citizens
- Become more aware of possible engineering career/academic paths that would foster the growth and support enrichment of societies in need

Rhetorical Context:

Writer:

You are an engineering student reporting on the global contributions being performed by members of the engineering profession. Since you are not yet an engineer engaged in professional work, your report will largely comprise information and ideas you research through sources you find via library databases. And, because your intended audience also has limited engineering knowledge and experience, the sources you use should not be too technical (i.e. too lengthy, data-oriented, scientific, or process/explanation-oriented). In short, you need substantive but not overly complicated sources that you can read, understand, and present to your readers in an easy-to-understand report encapsulating key aspects of the global problem you are raising and the solutions or potential solutions that can address it.

Audience:

Your intended audience comprises graduating high school seniors and freshman undergraduate engineering students. These students definitely know that they want to be engineers but do not have much specific knowledge concerning what engineers actually do. They want to know more about what an engineering career might involve, whether it would be challenging enough for them to take the time to pursue it, and how useful it might be to the world at large.

Purpose:

Your general purpose in writing this report is to make the intended audience gain a fuller understanding of the engineering profession and its potential value to the world. More specifically, your purpose is to make your intended audience aware of engineering opportunities they may not have otherwise known about but might want to investigate further for personal and professional fulfillment.

Assignment Requirements

Length:

Approximatley 1200-1500 words

Sources:

Four sources minimum should be referenced as in-text citations. Ideally, you will find as current sources as possible and no earlier than 2010.

Sources: 4 (minimum)

You need to incorporate at least four reputable, sources accessible through the library databases including magazines (i.e. *Time*, *The Economist*, or *Wired*), newspapers (i.e. *The New York Times*, *The Wall Street Journal* or *The Guardian*), or industry magazines/journals (i.e. *IEEE Technology and Society*, *Engineering and Technology*, *The Chemical Engineer*). You will be required to submit copies of your print sources when you submit the report draft.

Website source: 1

You may include one *approved* website source such as [Engineers without Borders](#), which we will be discussing in class. Other possible websites include: [United Nations Sustainable Development Goals](#) or [Water for South Sudan](#) or <http://www.waterforlife.org/>

Graphics:

2-3 graphic elements (i.e. photographs, charts, or info/pictographs) should be included to help readers better understand the global problem being discussed.

Required graphic: Include a map showing where the global problem takes place

Other graphics: You may choose to include a photograph of the peoples/geographical areas affected by the problem or a photograph/graphic depicting the engineering solution/device helping to address the problem. Another possible graphic you might choose to include could be a bar or pie chart conveying significant information (i.e. infant mortality rates over a three period since the global problem has occurred).

APA Citation Style:

You are required to use APA style and include in-text citations and a Reference page. You will also need to cite any and all of the graphics/pictures you include.

Report Structure:

Part I: Identifying the global problem:*What do I discuss?*

In this portion of the report, you will need to provide content that helps your reader gain some background understanding of the problem in question. As you build the discussion here, you are leading up to an engineering solution that will be discussed in the next section of the report. Here are some questions you should be responding to in this section:

What is the problem? Where and how long has it been taking place? What political, cultural, or environmental factors contribute to it? Whom does it affect directly/indirectly? What are the short and long term consequences?

What sources should I find for this section?

The source or sources you integrate into this section should reflect the questions listed above. It/they should provide information discussing the:

- geographical area where the problem occurs and/or other places where it has occurred
- environmental factors causing the problem (i.e. climate change, natural disasters)
- political or cultural factors complicating the problem (i.e. trade policies or war; social or religious values)
- negative effects caused by the problem (i.e. increase in disease or death, pollution, ongoing damage to the ozone layer, disappearing animal species)
- differences/comparisons between the affected and unaffected peoples elsewhere

Part II: Solutions to the global problem

What do I discuss?

In this portion of the report, you will need to provide content to help make your reader aware of what is being done to address the global problem you outlined in Part I. In short -- How are engineers attempting to solve the global problem?

What sources should I use for this section?

Use sources discussing the solution to the global problem or would help make that solution possible.

How do I manage/utilize my sources?

Read your sources carefully. Then, prepare a summary of what they are discussing and paraphrase any important points. As you prepare this portion of the report, consider the following questions to help you focus on the effectiveness of the solution. Your discussion should address the following questions:

What solutions have engineers/scientists/researchers been implementing to try to solve the problem?

Part III: Reflection Analysis:

In this portion of the report, you will be moving beyond the academic exercise of performing a writing assignment to demonstrate your self-awareness of what you have learned about yourself in the course of exploring a global problem. If you offer a detailed, developed, meaningful reflection, this portion of the report could be the most influential factor in helping the report achieve its original purpose – namely, to help your intended audience become aware of the value of engineering and to consider how this profession might bring them personal and professional fulfillment.

Your reflection needs to address two aspects of your understanding:

Your personal understanding: Are global problems as insurmountable as they might seem? How does this assignment make you think about your own life and the resources available to you? How might you apply what you learned to your own life?

Your understanding as a future engineer: What were your engineering ambitions/goals before completing this assignment? Have they changed, expanded, or become more nuanced? Would you say that social responsibility and ethical integrity comprise important aspects of the engineering profession? Do you think future engineering students should be exposed to humanitarian-oriented engineering projects?