CHAPTER 28: WRITING ESSAYS ABOUT DESIGN

Chapter outline

- Analytical essays (EDC I)
- Persuasive essays (EDC II)
- Format and visual design in the essay

Much of the writing in EDC is team-based, or collaborative, writing. Because the course serves to fulfill your writing requirement, however, it is important that everyone have an opportunity to write on his or her own and to revise that writing based on feedback from instructors and other students. Essay assignments in both quarters of EDC give you that opportunity. In addition, the content of the essays allows you to reflect on what you are learning about design in EDC.

The essays should represent your best writing. You'll be asked to write two drafts of each and will receive feedback from your instructors between drafts. Four other chapters of this text provide advice that you will need to use in writing these essays:

- Chapter 2: "Researching and Defining the Problem" The essays should be based on good research and problem definition. Both essays will depend upon understanding what constitutes problems and solutions in human-centered design.

- Chapter 20: "Visual Communication" The essays should be formatted using the guidelines from this chapter. The chapter also provides advice on using figures and tables.

- Chapter 24: "Revising for Clarity, Conciseness, and Correctness" The essays should be well-organized with well-focused paragraphs. They also need to be edited to eliminate vagueness and wordiness.

- Chapter 25: "Documenting Sources—and Avoiding Plagiarism" All the sources in your essay should be documented in a reference list. All quotations, paraphrases, and source-specific facts should be documented with parenthetical citations.

This chapter focuses primarily on the content of the two essays. It ends with a brief discussion of visual communication in essays.

28.1 ANALYTICAL ESSAYS (EDC I)

The EDC first-quarter essay focuses on analysis. For this assignment, you will write a 3-4 page double-spaced essay, analyzing a product or system from a design point of view. You can choose from a number of different approaches, as long as they have been approved by your section instructors:

1. Identify a product or system that you believe is well designed, based on design criteria that you learn about in EDC. Analyze why the design is effective for its users.

2. Identify a product or system that you believe is poorly designed, based on design criteria that you learn about in EDC. Analyze why the design is ineffective for its users.

3. Compare two competitive products or systems, one that you believe is well designed and one that is poorly designed. Analyze why one is better than the other.

4. Compare two similar products or systems aimed at two different user groups. Analyze why each product is designed well (or poorly) for its intended user group.

5. Analyze the effectiveness of a design of a product or system from a specific point of view: ethical, ecological, safety, aesthetic, cost-benefit, etc.

Your communication instructor may suggest other approaches.

Remember that analysis focuses on "why" and "how," examining parts of the whole and relationships. A writer can explain how something works, examine the cause of the problem, or break down a problem into subproblems. Analysis involves the same intellectual process in writing that it does in engineering problem-solving. The most important thing about analytical discussion is that its goal is to help the reader understand.

Below are important things to think about as you plan and write the essay.

28.1.1 Choosing a topic

To choose a design to analyze, consider items that you see and use daily—things in your home, dorm room, cars, classrooms. You can also consider items in public spaces (for example, vending machines) or items for sale in stores. Your essay will be most interesting to you and your readers if you choose a design that you know well and care about because it affects you directly. It will also be more interesting if you narrow the topic so that you can go into depth on it in three or so pages. Here are two methods for narrowing the topic:

- Focus on a specific model. For instance, instead of writing about several computer keyboards, one student wrote about the Logitech Cordless MX Duo.

- Focus on one set of related user requirements and exclude all others. For instance, you may decide to discuss only those requirements related to functionality (ease of use, versatility, and performance), eliminating from consideration such requirements as aesthetics and cost.

You can base your analysis simply on your own observations of the items and of people using the items; if you like you can also do some reading about the products, the designers, and the design context.

28.1.2 Deciding on an audience

One important step in planning an essay is to identify who your intended (and ideal) readers are. You might decide to write the essay for EDC students or for an audience of potential users of the product. Your decision about audience will affect every aspect of the essay: how you write the introduction in order to interest your readers, how much background you present about the product, how much technical detail and terminology you use, how you conclude the essay in order to provoke readers to keep thinking about the topic, etc.

28.1.3 Developing a thesis and organization

Your essay should present a well-defined main point that you want to demonstrate about the product. Here are examples of clear thesis statements.

> Example 28.1: Effective thesis statements for an analytical essay
>
> Thesis 1: The Logitech Cordless MX Duo successfully meets the user's physical, cognitive, and emotional needs (Beithon, 2004).
>
> Thesis 2: Blender 3-D graphics software is exceptionally well suited for hobbyists and students working on small personal projects, while Maya is well designed for professionals working on large projects. (Matsuda, 2004)

In both cases, the thesis statements go beyond vague statements like "the product is a great design" by specifying what makes it great or who it's great for. You should strive for the same precision in a thesis that criticizes the product.

The essay's organization should derive from the thesis. For instance, here's the outline (excluding the introduction and conclusion) of the essay whose thesis was, "The Logitech Cordless MX Duo successfully meets the user's physical, cognitive, and emotional needs":

> Example 28.2: Outline for analytical essay on
> Logitech Cordless MX Duo

1. Methods of meeting physical needs

    a Wireless technology

    b Ergonomic form of keyboard and mouse

  2. Methods of meeting cognitive needs

    a Key positioning

    b Labeling of F-keys

    c Positioning of advanced buttons

  3. Methods of meeting emotional needs

    a Color and shape of keyboard

Each lettered item in the outline above was developed in a separate paragraph in the essay. In addition, each paragraph began with a clear topic sentence stating the main thesis-related point of the paragraph.

Below are the introductions of three analytical essays written by EDC students. Each takes a different analytical approach.

The following introduction comes from a comparative essay examining how two different types of computer ports—Firewire and USB—developed as different solutions to the same problem:

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Example 28.3: Introduction to an analytical essay
comparing two products

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> Anyone using computers for the past 10 years knows that the computer industry has gone through many changes. Processor speeds have increased by more than tenfold, high-end graphics cards are a necessity, and PC towers have halved in size. Although these more apparent changes are noticed, the more subtle changes are often overlooked. One such change is the shift from parallel ports to Universal Serial Bus (USB) and FireWire ports as means to connect external devices. Parallel ports lacked fast transfer rates, had high cabling cost, and limited the number of peripherals per computer to the number of ports available. Both USB and FireWire designers were interested in designing a product that would raise transfer rates between computer and peripherals, decrease implementation and cable costs, and increase the number of devices supported on a single bus. The goal of these designers was to create a single system that would replace various ports on a computer with a universal port. Although the designers had the same goals in mind, they tackled the problem slightly differently, visualizing two similar yet distinct solutions. (Van Norden, 2005)

The essay then is organized to discuss the limitations of parallel ports, what designers were trying to accomplish in designing new ports, who developed FireWire and how FireWire meets these goals, who developed USB technology and how that meets the goals, and finally the pros and cons of each approach.

The next introduction comes from an analytical essay that takes an historical approach. It analyzes how the design of golf balls evolved to make the golf balls fly faster and straighter.

Example 28.4: Introduction of analytical essay examining how a design developed

The top ten long-ball hitters on the PGA tours today have an average drive of 300.6 yards, with Tiger Woods leading the pack averaging 303.3 yards. The top ten most accurate players hit the greens in regulation (two under par) 77.2% of the time, with Sergio Garcia leading the pack with an outstanding percentage of 81.9% ("Garcia"). Compare this to Arnold Palmer, "The King of Golf" who at the peak of his career averaged 272.3 yards and hit 72% of greens in regulation ("Pro's")). One must wonder why golfers' skills are increasing at such an exponential rate. However, when you look at the equipment they're using now, compared to previous technology, the answer is clear: the new golf ball design. The history of the technology of golf balls is over five hundred years of innovations and shows a story of man's ingenuity to create a device that will fly straight and far. (Grafton, 2005)

The essay is then organized to trace the history of design innovations in golf balls—and how those innovations affected the game of golf.

The following paragraph introduces an analytical essay that examines the reasons that various types of window coverings fail to work effectively—and how a new design will solve those problems:

Example 28.5: Introduction of analytical essay examining why window covering designs fail

Do you ever get tired of broken window shades, or of cumbersome window curtains? What about the color fading on the cloth on your furniture because the sun hits it through the windows? Isn't it annoying when the sunlight coming through the space in the curtains prevents you from seeing the TV? These are just some of the problems with common window coverings on the market: they are either dangerous, dirty, easily broken, or just let in too much light. Studies have shown that there is a significant risk of infants choking from the cords of blinds or roller shades ("Window"). These roller shades often break due to a malfunction in the roller mechanism. Horizontal blinds also become dirty quickly and are difficult to clean. Vertical blinds, although they do not become dirty as quickly, do have a habit of breaking easily. Drapes, another window option, fall into the dirty category and often don't prevent all sunlight from entering a room. There is often that small sliver of light coming in from between the drapes that you can never get rid of. Often the drapes that are heavy and cumbersome enough to block out all light are difficult to remove and clean. (Kreie, 2005)

The essay is then organized by analyzing the problems of the most common window coverings and then analyzing how a new electronic window darkener solves these problems.

28.1.4 Supporting your thesis

Even though this essay is primarily analytical, you still need to provide persuasive support for your thesis. To make the essay persuasive, include evidence and anticipate objections. Evidence can come from a variety of sources: magazine articles, product reviews, personal experience, surveys of other users' experiences, illustrative pictures, explanations of the mechanics. Evidence that comes from articles, websites, interviews, etc. should be cited in parenthetical citations and a references page. Evidence also needs to be carefully evaluated. One student added little credibility to his essay about the superiority of Birkenstock sandals by relying entirely on claims and descriptions from the Birkenstock website. Review the end of Chapter 2 for a discussion of evaluating sources for credibility.

Below is an example of a paragraph that uses a combination of product specifications and personal experience as effective evidence to support a point about the convenient size of the Sony Cyber-Shot DSC-P8 digital camera

Example 28.6: A Paragraph that persuasively supports its claim

Size does matter: that is one thing that makes the P8 superior to the other Cyber-shot models. Weighing 206 grams and measuring 4.25 X 2.0 X 1.4 inches, which is slightly longer than a business card, the P8 is one of the tiniest 3.2-mega-pixel digicams on the market ("The Imaging Resource"). It fits perfectly into my purse, backpack and even my shirt-pocket. Its compact size also enables it to fit nicely into my hand (see Figure 1). The elongated shape provides space for me to extend two fingers comfortably across the front and top of the camera without blocking the lens or the control panel. (Heng, 2004)

To support her point about the camera's size, the writer included a photo of the camera in the palm of her hand.

To persuade your readers of your thesis, you should also anticipate their objections. To do this, you might provide counter-evidence to an objection. Or you might concede that the objection is valid but is outweighed by other factors. For instance, if your thesis states that the product is well designed, you might admit that one feature relevant to your thesis is flawed but that the many other outstanding features make that flaw very minor.

28.2 PERSUASIVE ESSAYS (EDC II)

The EDC second quarter essay focuses on persuasion and logical argumentation. Your instructor will give you a specific assignment; assignments may differ from section to section. You may be asked to propose an improvement to a consumer product, a public space or facility, a system, or any other design that affects the lives of real users; or to persuade the engineering community of the importance of your spring quarter project;' or to defend or criticize the ethics of a decision related to design.

Below are important things to think about as you plan and write the essay.

28.2.1 Choosing a topic, thesis, and audience

For this essay, choose a topic about which you can make a strong case—and then choose the claim you want to make and the best audience to whom you will address your claim. For example, if you identify a problem with the food lines at a specific dining hall, you might choose to write a persuasive essay arguing that the current system is inefficient and proposing a new system. The best audience for this might be the manager of the dining hall. If you want to write an essay arguing that one brand of competition swim suit is more effective than another, the audience might be competitive swimmers.

Whatever topic and audience you choose, your approach must be persuasive: your goal is make a claim (thesis) and to support that claim with evidence, reasoning and/or authority.

28.2.2 Supporting your thesis

To support your thesis, include evidence from your reading, personal experience, observations, surveys, interviews, or analysis. At the beginning of the writing process, you may believe your claim is supportable but may not yet have any evidence. To develop that evidence, you may have to do substantial research. This is part of the writing process—and one good reason to begin writing early.

Note that if your essay is recommending a change in a product or system, you probably will not be able to support your claim with empirical evidence. After all, the change hasn't yet been adopted. However, you *can* support those claims with strong reasoning. What makes you *think* that the recommendation will work? Why should others believe it will work?

As you draft your essay, it is also important to anticipate and address your readers' objections. You can either provide counter-evidence that negates their objections. Or you can concede their point, but argue that it is outweighed by other factors

Below are the introductions of persuasive essays written by EDC students. As you read them, pay attention to their claims and imagine the kinds of evidence they would need to support the claim. Also imagine what kinds of objections readers would have.

The following is the introduction of an essay designed to persuade airport administrators that the United Airlines check-in system at O'Hare Airport should be changed.

> Example 28.7: Introduction of persuasive essay arguing that a system is flawed and needs redesign
>
> I fly on United Airlines out of O'Hare International Airport at least twice in an academic quarter. I no longer fall into the false sense of security one might get from seeing that the check-in line looks relatively short. Although this line often appears to be a fraction of the length of the security line, I know that once I get to check-in I should put down my luggage and get out my book because that line is going nowhere fast. The problem is that the current check-in process creates significant confusion through a combination of poorly organized lines, the new computerized check-in system and a general lack of explanation about how the process works. These problems slow things down tremendously. Based on my observations made on Sunday, April 17th from 11 a.m. to 12 p.m., and Friday, April 22nd from 5 a.m. to 6.a.m., and during prior visits, I believe that this process could be redesigned in a way that would make it much easier and faster by implementing several relatively easy and inexpensive changes. (Pakula, 2005)

The essay supports its claim by providing evidence that the current system is inefficient and causes problems. To gather this evidence, the author observed United Airlines passengers waiting in check-in lines at O'Hare. She also interviewed passengers to get a clearer idea of what steps in the check-in process caused problems. The essay also proposed several changes to the current system, with reasoning to explain why those changes will solve the problems. The author anticipated that readers might object that the changes would be too expensive. As a result, she provided evidence that most of the benefit would be gained just by changing signage at O'Hare, a very inexpensive improvement.

The following paragraph introduces an essay written to persuade engineering design students that an EDC project—designing a pediatric scale—is addressing an important problem.

> Example 28.8: Introduction of persuasive essay on importance of EDC project
>
> Upon initial examination, the task of designing a pediatric scale may seem unnecessary. After all, decent pediatric

scales already exist. However, current scales are not error-
proof enough to ensure the healthy development of children.
In pediatrics, accurate measurements are necessary
because they profoundly influence a doctor's ability to deter-
mine the appropriate dose of medicine, track normal growth
during crucial developmental phases, and detect medical
conditions that require immediate attention. In this respect, a
pediatric scale that minimizes potential for error could
improve the health of children everywhere. (Hoffman, 2005)

The essay then goes on to support its claim with (1) evidence that current scales are not sufficiently accurate, based on interviews with physicians, and (2) evidence that inaccurate weight measurements can lead to health problems for infants based on research from the World Health Organization. The author anticipated that readers might think that it should be easy to get accurate weights for infants; after all it's no problem getting accurate weights for adults. To counter this preconception, the author provided a persuasive scenario to help readers visualize the problems that doctors and nurses have in getting infants to stay still on scales.

The paragraph below introduces an essay arguing that fans in laptop computers are ineffective and lead to both comfort and health problems. The essay goes on to propose a new user-friendly fan. The audience is McCormick students.

Example 28.9: Introduction of persuasive essay
arguing that a design is ineffective

It's Tuesday night and the engineers are at it again: furiously
punching away Matlab code on their laptops, in a desperate
attempt to finish their EA homework. As the sweat drips down
their faces, the students rush through the online text, trying to
learn the analytical solution to an oscillating differential equa-
tion. The sweat is not solely a product of stress; the students'
laptops are also working overtime, and, as a result, are liter-
ally heating up. Laptops have fans designed to keep the CPU
at a safe operating temperature; however, this operating tem-
perature is well above the optimal comfort zone for the
human users. As a result of the extra heat, not only do the
engineers develop an unfortunate habit of snapping at pass-
ing Weinberg students, but they also develop sweaty hands
and, potentially, fertility problems for the males. If only those
laptops had been equipped with user-friendly fans, those
poor tech students might actually enjoy working on their pro-
gramming. (Lee, 2005)

To support the claim that laptop temperatures are beyond the optimal comfort zone for human users, the author researched computer specifications for fans, measured temperatures from several computers, and researched the medical literature to identify the negative effects of prolonged high temperatures. All this information was cited in parenthetical citations and a references page. To support his proposal for a user-friendly fan, the author drew a sketch to illus-

trate that the fan could feasibly be moved to a safer location and then used both a sketch and reasoning to show how a different pattern of heat dispersal would lower the external temperature of the computer. The author anticipated that readers might argue that laptop designers had already thought about these things and had placed the fans in their current locations out of necessity. To counter these objections, the author pointed to a specific brand of computer that had redesigned components to make possible a change in fans.

As stated earlier, your choice of audience will influence every aspect of the essay. If, for instance, the student addressing the problems with laptop fans had been writing to a computer manufacturer, the introduction would have had to be very different. She could not have assumed the reader knew about Matlab and EA, she would have adopted a more businesslike tone, and she would have ended with a thesis addressing the reader's needs and interests: "Your company has an opportunity to gain an edge in a highly competitive market by developing an innovative system to cool laptops."

28.3 FORMAT AND VISUAL DESIGN IN THE ESSAY

In your past writing experience, you may have structured essays primarily as a series of paragraphs, paying no particular attention to the visual elements of communication: systems of headings and subheadings, figures, tables, bullet lists. These elements are increasingly important as you write in engineering, science, and the social sciences.

In your essays for EDC, pay as much attention to visual design as you do in your EDC reports. Chapter 20 provides advice for effectively using headings, figures, tables, and lists. Your essays should take advantage of all this advice.

As you draft your essay, be sure to do the following:

- Include a title that captures your key idea. (See examples in the References for this chapter.)
- Consider whether headings and subheadings will help your reader better see your organization. If so, use them.
- Include figures (photos, sketches, diagrams, data graphics) when they will be useful to help readers visualize the problems or designs you are discussing.
- Include tables when they help you present information concisely.
- Use bullets (or numbered lists) when you want readers to see listed items at a glance.

In addition, refer to Chapter 20 for guidelines about line spacing, margins, fonts, page numbers, and headers and footers. Note that the one major format-

ting difference between EDC essays and reports is that essays are double-spaced, while reports are not.

28.4 REFERENCES

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