(Disallowed Goal]

Likely a score of 0 or 1

Just as there is a difference between narrative and reflection, so too there is a difference between narrative for which the primary purpose is storytelling and narrative anecdote used as an example in a text written with an explanatory intent. This entry reads like a personal narrative about a time the writer had a goal disallowed in a critical soccer game rather than as an entry intended to present and justify the engineering design problem the student plans to address. The text does identify a problem and solution, but these are not presented in ways typical of an engineering design project.

In this narrative, the writer presumes audience familiarity with both the sport of soccer and some of its famous practitioners (Zidande, Viera). Given that the audience for the engineering design portfolio is not only students' classmates and teachers, but also unfamiliar readers who are interested in, and have background knowledge about, engineering design, this presumption may be problematic.

This entry exhibits some of the same issues/weaknesses as the other examples included in the discussion of Element N. The writer includes some informal language (e.g., "every goal is huge") and some sports jargon (e.g., "upper 90," "FIFA requirements") that may not be familiar to readers. Most critically, however, the writer embeds the engineering design problem in such a way that readers have to "unpack" this entry to identify the intended problem. That they may not be willing to do so means that entries like this one do little to contribute to the perception of strong performance when writing like an engineer.

Engineering Design Process Portfolio Scoring Rubric
Component and Element Titles

Component I: Presenting and Justifying a Problem and Solution Requirements

- Element A: Presentation and justification of the problem
- Element B. Documentation and analysis of prior solution attempts
- Element C. Presentation and justification of solution design requirements

Component II: Generating and Defending an Original Solution

- Element D: Design concept generation, analysis, and selection
- Element E: Application of STEM principles and practices
- Element F: Consideration of design viability

Component III: Constructing and Testing a Prototype

- Element G: Construction of a testable prototype
- Element H: Prototype testing and data collection plan
- Element I: Testing, data collection and analysis

Component IV: Evaluation, Reflection, and Recommendations

- Element J: Documentation of external evaluation
- ***Element K: Reflection on the design project***
- Element L: Presentation of designer's recommendations

Component V: Documenting and Presenting the Project

- Element M: Presentation of the project portfolio
- Element N: Writing like an Engineer

Please Note: Elements M and N require no submission from the portfolio author(s) and are intended to be scored based on the portfolio work as a whole from what has been submitted from Elements A through L

Element N: Writing like an engineer

While all other elements are assigned a score based only on the contents (text, graphics, video, etc.) for a given entry, the score for Element N is based on a review of all the writing done within and across a portfolio. The score decision may be considered holistic, since it is applied to the work overall.

Most writing by K-12 students occurs in the context of English Language Arts. The most common types of writing are narrative—accounts of real or imagined events experienced by the writer or someone else—and expository—presentations of ideas and information about a topic. With the introduction of the Common Core State Standards (CCSS) in most states, argumentative/persuasive writing—the presentation and support of opinions based on the evaluation of evidence—will also need to be part of students' writing repertoire. The CCSS include not only standards for English Language Arts but also for Literacy in History/Social Studies, Science, and Technical Subjects. It is thus more important than ever that students learn and become comfortable with the discourse conventions of the various STEM disciplines. That includes being able to "write like an engineer."

What does it mean to "write like an engineer"? Volumes could be written on the subject, but some of the most critical features of such writing are the following:

- A focus on discipline-specific content (the processes and products of engineering)
- The development of texts with facts, definitions, concrete details, and quotations from experts (duly identified)
- The use of timely, relevant, and accurate data and supporting evidence
- The use of timely, relevant, and credible sources and the complete and accurate citation of those sources
- The establishment and maintenance of a formal style; this includes language choices, syntax, and text features/text structures appropriate to the audience and purpose for a given piece of writing
- The strategic use of techniques such as analogy, simile or metaphor to convey and develop understanding of key ideas; that is, use of these techniques not simply for color or effect but to enhance readers' understanding
- Use of precise language and discipline-specific language
- An objective voice, particularly when setting forth and evaluating claims/counter-claims
- Attention to audience through the use of details and examples that anticipate the audience's concerns and level of expertise
- Attention to the norms and conventions of writing by engineering professionals
- Command of the conventions of standard English grammar and usage, along with correct capitalization, punctuation, and spelling

A few excerpts from various portfolio entries may serve to illustrate what it means to write like an engineer.

Element N: From the Engineering Design Process Portfolio Scoring Rubric (EDPPSR)

Element N: Writing like an Engineer

5 Abundant evidence of the ability to write consistently clear and well organized texts that are developed to the fullest degree suitable for the audience and purposes intended (to explain, question, persuade, etc.); texts consistently demonstrate the ability to adjust language, style and tone to address the needs and interests of a variety of audiences (e.g., expert, informed, general/lay audience) and to use a wide variety of forms which are commonplace among STEM disciplines (e.g., notes, descriptive/narrative accounts, research reports); where required by convention, appropriate documentation in standardized form (e.g., APA) is consistently evident.

4 Evidence of the ability to write clear and well organized texts that are generally well-developed for the audience and purposes intended (to explain, question, persuade, etc.); texts generally demonstrate the ability to adjust language, style and tone to address the needs and interests of a variety of audiences (e.g., expert, informed, general/lay audience) with minor exceptions and demonstrate the ability to use a variety of forms which are commonplace among STEM disciplines (e.g., notes, descriptive/narrative accounts, research reports); where required by convention, appropriate documentation in standardized form (e.g., APA) is generally evident.

3 Adequate evidence of the ability to write usually clear and generally organized texts that are at least partially developed for the audience and purposes intended (to explain, question, persuade, etc.); texts demonstrate the ability to adjust language, style and tone to address the needs and interests of several different audiences (e.g., expert, informed, general/lay audience) but may be unsuccessful at doing so on occasion; texts demonstrate the ability to use a several different forms which are commonplace among STEM disciplines; where required by convention, appropriate documentation in standardized form (e.g., APA) is sometimes evident, although attempts at documentation may reveal minor errors

2 Only some evidence of the ability to write clear and organized texts that are at least partially developed for the audience and purposes intended (to explain, question, persuade, etc.); texts demonstrate some ability to adjust language, style and tone to address the needs and interests of at least two different audiences (e.g., expert, informed, general/lay audience) but adjustments are not evident—although warranted—in a number of instances; texts demonstrate the ability to use at least two different forms which are commonplace among STEM disciplines; where required by convention, appropriate documentation in standardized form (e.g., APA) is frequently missing or incorrect.

1 Little evidence of the ability to write clear and organized texts that are at least partially developed for the audience and purposes intended (to explain, question, persuade, etc.); texts demonstrate little ability to adjust language, style and tone to address the needs and interests of at least two different audiences (e.g., expert, informed, general/lay audience) but many adjustments are not evident— although warranted; texts demonstrate the attempt to use at least two different forms which are commonplace among STEM disciplines; appropriate documentation in standardized form (e.g., APA) is usually missing or incorrect.

0 Virtually no evidence of the ability to write even somewhat clear and organized texts that are developed for the audience and purposes intended (to explain, question, persuade, etc.); texts demonstrate virtually no ability to adjust language, style and tone to address the needs and interests of at least two different audiences (e.g., expert, informed, general/lay audience); there may be evidence of an attempt to use at least two different forms which are commonplace among STEM disciplines but these are not correctly differentiated; there is virtually no evidence of any attempt to provide documentation in standardized form where needed.

Element N:
Writing like and engineer

Disallowed Goal

In all sports players try to get an advantage over others. This can be done by hard work and training, but the easy and fast way to do this is to cheat. Soccer is no exception. Occasionally a ball will cross the goal line making it a goal but the goalie will quickly pull the ball back over the line and the referee won't see it. Therefore it will not be called a goal. With the field being so big and so busy with only three referees, it can be easy to get away with this. Also in soccer every goal is huge since there may be only one goal the entire game. So being able to score an extra goal that would not have been called or to steal a goal that should have been called could make a huge difference.

When I first saw this problem it was during the World Cup. The game was France verses South Korea. France was up 1-0 during the second half when France got a corner kick. Zidande kicked the corner right to Viera's head. When Viera headed the ball to the goal it went in but the goal was able to hit it back out onto the field. Towards the end of the game Korea scored making the score 1-1. Luckily France had enough points in their group to go on to the second round.

I was absolutely certain that this was a big problem was when my team played black in the preliminaries of the State Cup. We were losing 1-0 when we got a free kick about 30 yards away from the goal. Since I was the one that created the foul I got to take the free kick. When I shot the ball it curved towards the upper 90 of the goal. The

Element N:
Writing like and engineer

ball hit the top net and went straight down on the goalie's back. The goalie was in the goal; since it hit her back it should be counted a goal. If the ball touches the net than it is obvious that the ball crossed the line; the net is inside the goal. Normally the linesman is supposed to be with the last defender, but in this situation the center referee should have been with the defenders while the linesman is at the goal line. Everybody around me, behind me, to the side of me, basically everywhere except where the referees were standing could clearly see the ball go into the goal.

There needs to be a way to solve this problem. This is starting to happen more and more in games. Teams have lost championships, tournaments, and really important games. Due to this problem the teams lose money and without money the managers can not buy better players. After plenty of research we came up with the idea of using RFID sensors. These sensors would be placed inside or behind the posts. I am leaning towards putting the sensors behind the goal because if they're in the posts the sensors will weaken the post which doesn't follow FIFA's requirements. FIFA is the organization that controls the soccer in England and all professional leagues except in the United States. If our idea doesn't follow FIFA's requirements then we cannot pursue this solution. There will be RFID tags in the ball so that the sensors can detect the ball when it completely crosses the goal line.

With this solution the game will become much more genuine. The referees would have one less thing to be blamed for. If you ask any referee, they would say the hardest part of their job is making the right call. The have so much pressure on them that it's hard for them to always make the right decision. So, putting sensors in the goal will help release all lot of the tension on these referees.