Why English is Necessary in STEM

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English in STEM

**Introduction: New Knowledge for a New Generation**

The 21st century is full of technological advances. Many of these make our lives easier. Some come from years past, and have been improved thanks to the advanced technology available. Others are only beginning to be explored as viable options in the home. Whatever the reason for the technological advance, there is no doubt that we need scientists, engineers, and experts in the fields of technology and math. When peer pressure is added, it becomes a recipe for a world of scientists, and engineers. Despite this recipe designed to push more into these majors, the rest of the technological world is pushing for people to study the English language as a second language.

Nowhere in the world is that push to study STEM subjects felt more keenly than in the United States of America. Out of the fifty states in the country, fifteen across the country offer students unsure of what to major in a financial incentive to major in science, technology, engineering, or math – the STEM majors – and the incentive extends to those who already know they want to major in one of these four areas (Cohen). However, this push comes with consequences for students who may not enjoy these subjects, or have a penchant for something else, who study in the United States.

Since the United States is a very large country, it has pull in the technology world. Then, there is the rest of the world. When it comes to pushing STEM majors, something else is also stressed in various technology companies with headquarters around the world. In no aspect is that more apparent than the fact that many technology companies around the world mandate English as the language of business. As an example, a study on a Taiwanese firm found that over ninety percent of employees used English on at least a weekly basis (Spence and Liu).

However, it’s not so clear cut. The issue in the United States also extends to arguing in favor of adding the arts to the STEM program. While the arts and English are separate degrees in colleges, they often get the same treatment: discrediting.

**My Position: English Brings Skills to the Table**

The United States typically has a bubble around them; the government does what they think is best, despite what studies may say at the time. This bubble pops when it comes to STEM encouragement. The rest of the world is focusing on English.

One benefit of English is that it helps those in Asian countries develop a Western line of thinking. This facilitates easier international coordination in large companies that have headquarters outside the United States, but also have regional offices *within* the United States. A case study of four hundred and thirty-six Chinese students – ranging in age from the Chinese equivalents of seventh through twelfth grade – concluded that as the students studied English, their “analytic proficiency improves along with the improvement of their English language proficiency” (Jiang 14). When Western students learn English, this advantage is already being engrained in them. English is a Western language, which is often overlooked in the United States.

One interesting twist to this tale is that Western workers often don’t realize how much they should be thankful for until they are in a workplace where English is going to be the official language. Tsdal B. Neely and Tracy L. Dumas – from Harvard Business School and Ohio State University, respectively – studied what happened when a company headquartered in Japan decided to make English the language all internal memos and presentations would be created in. The employees headquartered in the United States are quoted as saying that they thought they were “in an incredibly lucky position”, “really good at this!”, and were excited that already knowing English would allow them to reap rewards with minimal work (23). When the Japanese employees were interviewed, however, these views were not shared; many thought that this change was coming (31-32). With that noted, they also felt as though the only option they had left was to study English because they were worried that the only indicator of promotions in the future would be their scores on an English exam (32).

This view of needing English was shared in another study. An engineering company headquartered in Taiwan participated in a study where at least ninety-five percent of the employees interviewed noted that they had to write something in English at least once a week (Spence 102).

With a global push on knowing how to write and speak English properly, the graduates in the United States have an opportunity to study the language as their native tongue. This advantage typically isn’t something United States students see, as many only take the classes they need for their major. This was demonstrated in a study of students taking a STEM elective class (Enderson 34).

**Opposing Argument: STEM Push**

There is a history of pushing for more people to go into these fields in the United States stretching back to at least 2016. The governor of Kentucky, Matt Bevin, stated that he thought students going into French literature majors “should not receive state funding for their college education” (qtd. in Cohen). This is one of many comments attempting to federally defund the arts, and an English skill. However, the comments are not unfounded.

The Bureau of Labor Statistics released a graph in 2014 that projected the rise of various STEM careers (see fig. 1). The graph shows an estimated rise in what careers will have more available jobs as time goes by. All STEM fields combined will have an 18.7% increased need for jobs between 2010 and 2020. The graph also shows various STEM fields that are expected to have more jobs than they currently have. Even lawyers are included, which aren’t often thought of being a job under the STEM umbrella. Other jobs included in the umbrella on this graph are scientists of all kinds, engineers, computer programmers, and postsecondary teachers.



Figure 1. *What does the S&E job market look like for U.S. Graduates?* (National Science Foundation)

However, the trend does not stop here. Students also feel pressure from the society around them. These societal pressures include an increase in high student loans, a place in the workforce for skilled workers that is hard to fill, and even a common practice of looking down on the humanities – which is where English falls (Cohen). Kentucky’s governor is not the only politician looking down at those who chose to study the humanities. Politicians the United States over have been worried about how college students, and students in general, have been doing in these fields – and wondering how they can bring help failing students (Drew).

The comments don’t stop there. Cohen quotes Anthony Carnevale’s comment on an educational equivalent of buyer’s regret due to the high student loans out there, and an inability to pay it back due to which college degree the students chose. The quote goes so far as to say that “you can’t be a lifelong learner if you’re not a lifelong *earner*” (emphasis added; qtd. in Cohen). Many will argue that a student has to study either arts *or* sciences because they’re incompatible (Feldman).

Not everyone pushing for STEM has noted that the humanities are not worth studying, contradicting the notion that the two disciplines are incompatible. One example of this is when the Obama administration attempted to rate all the colleges in the United States by student debt and completion rates – as many already boast to their advantage – *as well as* what the projected earnings for the degrees offered there would be after graduation (Cohen). This has been the exception to the rule, more often than not.

**Response to Opposing View: Not for Everyone**

Despite the fact that many disregard the humanities, English is often discredited simply because there are few careers that everyone can think of that require an English degree. That said, areas within the STEM umbrella are not for everyone. Once those interested in these areas, and math and science in particular, get to college, they’re often stuck in what David E. Goldberg – an engineering professor – calls “the math-science death march”, where they are hit hard with memorization and no practical application of the skills in the classroom (qtd. in Drew).

This idea has gotten a lot of attention. One high school may have an insightful answer to how to avoid this: the idea of adding an “A” for “Arts” to STEM – making it STEAM. One key difference between the two programs is that STEAM takes the principles taught in STEM, adds freedom to apply it as students want in an art class, and lets the students run with their ideas through trial and error, as Anna Feldman explores in her article for *Slate*. The article also notes that the critics of STEAM are missing the point of the program; while STEM and STEAM may have a lack of engagement, it doesn’t come from the STEAM area – it comes from a lack of diversity in teaching in the traditional STEM schools. The point of adding the arts is to allow students to find a creative thinking process that *aids* them in their chosen STEM field (Feldman).

This is not the only reasoning behind allowing everyone a chance to experiment with applications of these subjects before college. Almost sixty percent of students who start out in a STEM field in college will drop out due to the dry teaching conditions (Drew). Furthermore, many who want to go into these areas are held back by one major requirement of all four areas: a good handle on lower-level mathematics.

Mary C. Enderson and John Ritz conducted a study of three hundred and thirty-two students in a STEM elective course their freshman year in college. They found that only ninety-four of the students had taken a higher-level math class, or a mathematics class that was higher than the typical high school algebra, and those classes were either pre-calculus or calculus taken during their college years (35). As for classes done in high school, Enderson and Ritz found that only a hundred and sixty-five students had completed something harder than algebra two (35).

This is a jarring fact. Since math is a foundation skill of the other STEM subjects, when a student does not do well in math, they *will not* do well in the other subjects. Since the push to study in these areas is meant to spur creativity and technological pull in the world, it does not make sense to push students into an area they don’t easily understand.

**Conclusion**

The STEM epidemic is hitting the United States hard. The mix of dry teaching styles for various science, mathematics, and engineering classes and stigmas around studying the arts as a figurative death sentence for any career has led to a dangerous assumption that English is not needed anymore as a class or a degree. With the world working closer to programs resembling United States STEAM programs and more companies making English the preferred language, the United States needs to play catch-up. As STEAM programs receive more recognition in the news and for what they are doing, the United States could potentially turn their situation around. Until the politicians and the country at large are willing to recognize that English is a skill demanded on an international level, there is not much that students who desire to go against the grain of desirable college degrees can do.

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