

Integrating Research and Writing Across US Public High School Curriculum

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Traditionally, in most US public high schools, English Language Arts teachers and their courses have been responsible for teaching research techniques and appropriate writing skills to students. Typically each year, one research project is assigned in an English class, and that is the extent of research for students. While students will write in English courses, many other classes do not assign research nor writing based course work and rely on objective formative and summative evaluation of student knowledge that does not involve critical thinking and synthesis. Other disciplines may, on occasion, require a research type of project; however, it is often allowed to be a “cut and paste” project in many ways with the actual pure research components as optional or non-existent. The integral parts of teaching research and writing have become the responsibility of English teachers when it should be a shared responsibility across disciplines. Further, other academic teachers do not often feel obligated as non-English teachers to ensure student success in learning proper research techniques nor writing skills, the importance of the steps needed for research, nor how to research and write successfully.

Since these are essential skills that high school students need for college and career, it is imperative that students have exposure to research and writing in all subject areas, not just English, and it is equally important that all teachers are teaching students how to utilize proper research skills and how to write effectively. However, one problem to this end seems to be the lack of confidence or knowledge teachers have when it comes to teaching research and effective writing skills to students. Another barrier to teaching these important skills seems to be a lack of effort or responsibility on the part of teachers to take on these important but extremely time

consuming assignments. Regardless of the reasons why, students graduating from public high schools often do not have the ability to successfully complete undergraduate course work because of a deficiency in research and writing skills. Implications of this continued practice and teacher mindset and possible solutions to this problem are discussed.

There was a time in the US education system in which test scores in public schools did not drive curriculum. Technology was not an option, and critical thinking skills were utilized to research and write. Visual stimulus was not required to keep students engaged, and immediate gratification for solutions was non-existent. However, this is not the educational system of the 21<sup>st</sup> century. While data and technology may now be driving curriculum, the fundamentals of critical thinking and coherent effective writing have been negatively impacted and left unaddressed by many educators and educational systems across the US.

Writing in public high schools, in many ways, has become formulaic and does not allow for student writers to explore their own ideas. This “invariably leads to essays with multiple sources but little coherence and even less room for the author’s own voice” (Medvedeva and Recuber, 2016). Students are not usually taught how to question the information they read nor how to effectively propose an argument. This leads to a blind acceptance on the part of students and promotes memorization without much cognitive synthesis, and students accept this in order to answer correctly on objective formative and summative evaluations that follow.

Defining academic subjects that should be including research and writing as part of their curriculum should be explored. All humanities-based courses should and could be incorporating research and writing into their curriculum, but research does not support this is occurring.

However, research does show that studies have been conducted to examine the benefit of research to the student scientist. In addition, a number of models for employing field research and the benefit of this in the science curriculum is available. There is little research available to indicate high school math courses participate in research or writing within their curriculum. The myriad of elective courses available and the simple fact that they are elective courses and are not responsible for the preparation of students for state assessments lends all of those courses to be open platforms for research and writing opportunities for students.

Current research does not seem to indicate that research skills are considered part of the standard US public high school curriculum across disciplines. However, research exists that emphasizes the lack of writing skills observed by universities for incoming freshman and undergraduate students.

An examination of college students writing skills found that “repeated practice in writing within a specific task domain” (Johnstone, Ashbaugh and Warfield, 2002) is important in improving writing skills in students. Research which focuses on the underdeveloped and inadequate writing

skills of many high school graduates entering college can be seen and can somewhat be used as a measure or correlation for the state of research and writing skills among current graduating high school students. Writing and critical thinking skills “are crucial abilities that should be rehearsed broadly across disciplines in order to facilitate the type of thinking needed in the 21st century” (Varelas, Wolfe, and Ialongo, 2015). If students can write well, with the proper instruction, students can eventually produce a coherent research paper; however, a student who cannot write well will not be able to complete this task, regardless if the research skills are explicitly followed.

Some research indicates that there are barriers such as the Common Core State Standards (CCSS) when trying to find the necessary time within mandated curriculum to focus on research and writing skills. Research also highlights possible solutions, such as tools and techniques that can be utilized by instructors, which are being developed and explored to affect change at the undergraduate level to better prepare students for the research and writing skills they need to be successful in college.

However, students should be entering college with the necessary research and writing skills already, so how can opportunities for research and writing be integrated into the US public high school curriculum to assist in preparing students for college?

## **Review of Literature**

### **Lack of College Readiness in Writing and Research for Incoming Freshman**

Entering college is daunting for many students. Effective writing and research skills are challenges for many incoming freshmen after graduating from high school. However, research conducted in New York by Varelas, Wolfe, and Ialongo (2015) indicate that 21st century knowledge more than ever will require students to have the ability to think critically, evaluate information and write effectively to convey information (Varelas, Wolfe. And Ialongo, 2015, p. 78). Because these incoming undergraduate students have not had the necessary preparation in high school for college readiness, when they attempt undergraduate course work, these college freshmen are often times unsuccessful. Conley (2007) notes in his research that “Several observational studies have found that high school students often complete prescribed tasks that require little cognitive engagement” (p.24). A student’s high school courses and college level courses differ greatly making the transition to higher education, utilizing critical thinking skills, and achieving success in this environment difficult (Conley, 2007, p.23-24).

Evaluating research that has been conducted at community colleges correlates well to the same issues concerning college readiness in high school students, particularly during the junior and senior years of high school. Varelas, Wolfe, and Ialongo (2015) concluded that structured writing assignments broken down into parts seemed to help students manage the writing requirements of college courses, and with continued use of this format, led to better writing skills. Further, exposure to different formats of research allowed students who were completely unfamiliar with various styles of formatting, such as Chicago style or APA style, to gain needed exposure in order for them to be prepared to move on to a four year university (Varelas, Wolfe, and Ialongo, 2015, p. 88).

**Developing writing skills and critical thinking skills in students attending public high school**

In order to assist students in public high school to develop writing skills and critical thinking skills, writing must be a recurrent practice with formative and summative feedback. Research conducted by Crossman and Kite (2012) examined the critical role peer review plays for students as they develop writing skills (Crossman and Kite, 2012, p. 220). Using a mixed method study, the research implored a holistic rubric to measure student growth over time. The study indicated that “significant gains realized between the initial draft and final proposal within each four measured areas (focus, support, organization, and writing conventions) (Crossman and Kite, 2012, p. 227). Therefore, Crossman and Kite (2012) concluded that writing skills are positively affected by peer review and continuous practice of these skills (Crossman and Kite, 2012, p.227). Incorporating these skills across disciplines would further expose students to continuous use and enriched more competent writing skills.

To take writing skills and incorporate them with research skills, high school students need to effectively use critical thinking to form arguments for research. Medvedeva and Recuber from Princeton University (2016) conducted research which examined how best to teach students to construct original, motive-driven arguments (Medveda and Recuber, 2016, p. 139-140). Ultimately, the findings indicated that teaching students to look for specific elements when reading, such as patterns, inconsistencies, and explanations facilitated students’ ability to break down the data and examine it in order to draft arguments to further assess the information and logically address it.

### **Incorporating research into the public high school curriculum**

There is little research to suggest that writing or research is taking place across disciplines in US public high schools. Therefore, examining available data led to specific courses, such as science, in which research indicates that research skills, particularly field research skills, have been evaluated. According to the National Research Council, scientific inquiry is vitally important for students in science courses (Naujock, 2009, p.369). In these courses, students need to see that research is about the natural world around them, and therefore, real field opportunities for research are paramount for students interested in pursuing science and STEM related majors in college. In Naujock's article (2009), she explores how field research can effectively be implemented into high school science courses, and why it is imperative to the science curriculum (Naujock, 2009, 369-370).

An article written by Gray, Coates, Fraser, and Pierce (2015) examines how research skills can be developed across the undergraduate curriculum (Gray, Coates, Fraser, and Pierce, 2015, 85). They noted that the ultimate goal for student involvement in research is going from the known to the unknown from a knowledge consumer to a knowledge producer (Gray, Coates, Fraser, and Pierce, 2015, 86). Their wide scope for this information examined research skill development, STEM workshops, pedagogical research, and practice for scholarly work, as well as case studies examining different colleges with initiatives to develop research skills throughout the undergraduate experience. This information can reasonably correlate to possible ways that US public high schools and school districts might implement similar initiatives.

One research study by Shilling (2011) analyzed the viability of curriculum mapping across disciplines to see if it would prove effective and sustainable (Shilling, 2011, p.28).



Ultimately the research showed positive aspects of curriculum mapping such as continuity of curriculum and increased collaboration, but noted there were also negative implications to the implementation of mapping. Measurable objectives and reduced test driven curriculum were noted as weaknesses with curriculum mapping. Therefore, the high school never fully implemented it as a tool.

A further review of much of the available literature indicates that while writing and research skills are admittedly weak for many students entering a four year university, some higher education institutions are navigating pathways to improve these skills for incoming freshmen, and junior colleges, in particular, are finding ways to close these gaps (Conley, 2007, p. 24-25). However, little research has been conducted to evaluate these deficiencies in US public high schools and address the curriculum barriers and issues of teaching writing and research skills across the curriculum.

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