THE IMPACT OF ORIGINAL ARTWORK AS A PREWRITING STRATEGY

A THESIS

Submitted in partial fulfillment of the requirements

for the degree of

MASTER of EDUCATION

by

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William Paterson University of New Jersey

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ABSTRACT

The purpose of this qualitative study was to determine if an interactive method, such as original artwork, would stimulate students' minds in the Planning phase of process writing, preparing them with concrete and internalized ideas that could enhance the quality of their composition. Equally important was the focus on whether this method of prewriting could benefit students' affective states through active engagement and by limiting the strain on their short-term working memory, so they could demonstrate more fluent writing, yielding a greater quantity of work completion. Two writing samples and their respective prewriting artwork from 35 ninth-grade students were collected and analyzed as part of the constant comparison data analysis in May and June of the 2024-2025 school year. As part of the triangulation design of this study, analysis of numerical data accompanied subjective evaluation in the categories of writing quality, writing fluency, work completion, and student engagement. Results indicate task-relevant drawing, such as the original artwork prewriting method, assists memory encoding and promotes writing fluency. Furthermore, students who prewrite tend to display more positive affective states during composition, which has a direct impact on their writing success. Suggestions for future research and recommendations for teachers are included.

DEDICATION

To my sisters for their encouragement, advice, and “Just keep swimming” texts.

To my co-teacher, Veronica Maeve Kurz, for taking on much of the grading while I researched and wrote.

To Dr. Carrie Hong for your miraculous guidance. I began with less than a seed of an idea; nothing could have grown without your kindness, grace, and feedback.

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CHAPTER I

Statement of the Problem

Introduction

Educator, writer, and advocate Alice G. Brand (1987) commented on the significance of the affective nature of writing. She questioned if affective states, along with cognition, impact students' writing abilities and production, specifically when writers begin a new piece (p. 441). No matter the cause of the struggle, the writing domain of New Jersey State Learning Standards for high school requires students to "develop and strengthen writing as needed by planning, revising, editing, rewriting, trying a new approach; sustaining effort to complete complex writing tasks" (Department of Education, 2024). In other words, students must adhere to and master the writing process. Teachers and students alike typically begin with the planning, or prewriting, phase. Once they comprehend the assignment, students begin to think about what they are asked to produce. Planning reduces students' cognitive load while writing, clearing their minds to focus on style, not substance. The intricacies of the prewriting will vary dependent upon the task, but in general, the goal is first to brainstorm ideas in relation to the prompt and then to organize them.

In fact, there are various notions on the best method of prewriting. Kellogg (1984) summarizes four of Flower's (1981) theorized weak strategies: the perfect-draft approach, the trial-and-error-sentence generation, waiting for inspiration, and linguistic form over content knowledge (pp. 148-149), identified forms of prewriting that are cognitively and affectively taxing. Referencing Murray (1985), Kellogg describes the importance of *essential delay,* or the notion that when faced with a difficult task, a writer may need time to gather information,

organize, and then internalize it (p. 149). He juxtaposes the weak list with stronger methods like brainstorming, notations, and satisficing (writing the term down and adjusting it later). Other initial prewriting strategies are lists, clusters, and outlines, all of which may be mental or written, and may be regenerated as needed. More popular strategies include freewriting, questioning, mind-mapping, and talking. Kellogg (1990) prescribes to the prewriting overload hypothesis, or the reduction of "attentional overload" (p. 328) to open space within the memory to complete other functions while composing. Listing and outlining, especially, suggest an organizational structure for the writing piece, making details easier to recall (Kellogg, 1984, p. 170) and promoting fluency. The formulation system in the updated process model (Hayes, 1996) demands the most cognitive strain within the writing process because the steps of planning and translating require students use the three components (central executive, phonological loop, and visuospatial sketchpad) of their working memory (Kellogg, 1996; Johnson, 2020). Thus, it is not surprising that prewriting is the step many students loathe and willingly skip because they deem it unnecessary (Sagavan et al., 2023, p. 232) and cognitively taxing.

This viewpoint directly influences students' writing progress. Those who abandon this step in the daily classroom are also likely to forgo it on high-stakes exams. Although prewriting is not a requirement on these tests, it is suggested that students spend five minutes brainstorming and organizing their ideas. With limited time, students need to think, organize, and write swiftly and clearly. Without a plan, content and style may suffer, leading to a low score, which may adversely impact their attitude towards writing in general. Furthermore, inadequate scores reflect poorly on teachers who have belabored prewriting techniques.

Within my thirteen years of experience teaching eighth grade and high school English, I have witnessed how students who prewrite come to appreciate its value. They exclaim how

simple it was to write the essay because they had already completed the difficult work. Meanwhile, others who often do not develop a plan struggle to begin, perhaps because they are "unfamiliar with various idea-generating strategies" (Alemu, 2020, p. 43). Once they grasp an idea, they struggle to continue because they lack "content which could help elaborate on their writing" (p. 43). In my classroom observations while monitoring in-class writing assignments and through discussions with other educational professionals, I have watched and recalled as these students spend an exorbitant amount of time staring at a blank page, waiting for genius to strike. The situations I have described utilized typical prewriting techniques such as graphic organizers, mind maps, outlines, and lists. In one particular scenario, I provided students with options for an essay topic on Harper Lee's *To Kill a Mockingbird* (1960) and a graphic organizer to accompany the chosen prompt. Each topic choice included sub-questions – the answers to which would populate the graphic organizer. Despite the scaffolded instructions, students struggled to begin brainstorming, and I grappled with how to assist them.

Within the past two years, in both my ninth and eleventh grade classes, I have assigned more art-based projects – some basic, such as draw a setting, while others a bit more detailed, like illustrate a main motif – preceding a short writing prompt. To my surprise, most students, including the reluctant writers, picked up the crayons, markers, and colored pencils and began to draw, color, and shade. As Dyson (1986) describes, students engaged higher order thinking skills and developed concrete representations of abstract ideas through original artwork. Afterwards, many of those same students addressed the prompt based on their art. While not all the writing was quality, I did receive more quantity. I also witnessed students completing the writing quicker with fewer staring blankly into space. I recalled the days of picture prompts, but this was different: students generated the art and then composed an analysis about or a comparative piece

regarding it. They were practicing the skills I had taught them, they were improving, and they were enjoying English class. Art became a "non-linguistic" composition tool (Smagorinksy & Coppock, 1993) through which students could express a multitude of ideas. Merged with a written description of the imagery, art provides students another method for investigating and organizing their thinking (Andrzejczak et al., 2005).

Research Questions

This section presents the primary research question, which is based on educational observations of students grappling with the process of prewriting. Given prewriting's invaluable benefit to the writing process, yet taking into consideration students' struggles with prewriting and its detriment on their self-efficacy, the intended question for this study is:

How does original artwork as a prewriting strategy impact the completion and quality of high school students' writing?

In addition to the primary research question stated above, this study also examines the following:

How does art as prewriting affect students' fluency in writing?

In what ways does art engage students more than other forms of prewriting?

Definition of Terms

This section provides a glossary of terms that was used throughout this research study. This study was designed to answer the research question: *How does original artwork as a prewriting strategy impact the completion and quality of high school students' writing?* For the purpose of this study, these terms are defined as follows:

Original Artwork: Original artwork, in this study, is defined as art created by the student. Specifically, students were provided with templates (one of a mask and the other of a tombstone) and task instructions. The final product is referred to as original artwork.

Brainstorming: Brainstorming, in this study, is the initial generation of ideas for a writing piece. It occurs before the prewriting stage.

Prewriting: Prewriting, in this study, refers to the meaning-making and organization of the brainstorming output. Prewriting may also involve the generation of new ideas or the refinement of previous ones. It occurs before the drafting stage.

Completion: The term, completion, in this study, describes the status of students' assignments. If an assignment is complete, the student has addressed all sections of it. The responses or work may be incorrect, but nothing is left blank. An effort was made.

Writing process: In this study, the term, writing process, refers to the stages writers pass through when composing. Typically, the writing process follows a sequence: brainstorming, prewriting, drafting, revising, editing, and publishing; however, because the act of writing is recursive, writers do not have to address the steps in order.

Writing fluency: Writing fluency, in this study, pertains to the ability to compose without strained hesitation. When ideas translate to sentences organically and students write with ease, a student is writing fluent. Fluency can also be measured by the speed at which one composes in relation to the quality of the composition.

P-burst: A measure of writing process fluency tracked by keystroke data. In this study, the time between two pauses during composition, regardless of placement, yields a P-burst.

Student engagement: Student engagement, in this study, refers to students' intrinsic or extrinsic motivation to participate in assigned activities.

Affective states: The term, affective states, in this study, describes students' attitudes towards the writing process. Students' emotions impact their cognitive processes, thus influencing learning outcomes.

Long-term working memory: In this study, long-term working-memory refers to the part of the brain responsible for the cognitive functions of knowledge processing and storage. When a writer recognizes clues or schema, their long-term memory activates, permitting the retrieval of stored behaviors, functions, and knowledge, which lessens the burden on the short-term working memory.

Short-term working memory: In this study, short-term working-memory describes the part of the brain responsible for the cognitive function of temporary knowledge retrieval and manipulation of information to solve problems. Short-term memory can hold seven-nine ideas at once, and when overloaded, novice writers have difficulty juggling the executive functions demanded by the writing process.

Linguistic: The term, linguistic, in this study, relates to any task or learning style that involves the use of written language.

Visual: The term, visual, in this study, pertains to any task or learning style in which drawings, symbols, or other forms of art are substituted for written language.

Theoretical Framework

This section presents theoretical framework upon which the research question is based. The research question is: *How does original artwork as a prewriting strategy impact the completion and quality of high school students' writing?* Additional questions inquire *How does art as prewriting affect students' fluency in writing? and In what ways does art engage students*

more than other forms of prewriting? These questions relate to the following theoretical theory and approaches: Cognitive Process Theory, devised by Linda Flower and John R. Hayes (1981; updated by Hayes & Nash, 1996); the Cognitive Developmental Perspective, defined by Ronald T. Kellogg (2008); and Bloom's Revised Taxonomy—Affective Domain as revised by David Krathwohl, Benjamin Bloom, and Bertram Masia (1973).

Flower and Hayes (1981) developed The Cognitive Process Theory after questioning the decisions writers make when composing. Their concern lies within the study of the "distinctive thinking processes which writers orchestrate or organize during the act of composing" (p. 366). Significantly, Flower and Hayes noted that more than one cognitive process occurs when writing, and it is the way in which writers systemize their thinking that leads to success. They challenge the "stage process model" (the standard writing model in the 1980s), which categorized writing as linear, by inquiring how, for instance, phases such as pre-writing and revision are linked since generating ideas differs from revising written text (p. 367).
Flower and Hayes suggest that the writing process is recursive, so any stage in the writing process can happen or repeat at any time because they are sub-processes of a hierarchical structure. This permits the product to be evaluated during its commission, lessening the potential for student anxiety (Bayat, 2014).

The focus of this study is pre-writing, which Flower and Hayes (1981) nested beneath the Planning process. They acknowledge that writers "form an internal representation of knowledge [which]…is likely to be more abstract than the writer's prose…A whole network of ideas…could be held as a visual or perceptual code [which]…the writer must then capture in words" (p. 372). While this study focuses on the external representation of knowledge, the ideas or words still symbolize abstract embodiments ready to be transformed into written prose. A sub-process of

Planning is generating ideas, or as referred to in this study, brainstorming. The students whose work has been analyzed struggle with this phase in the writing process; their brainstorming is typically unclear to both the teacher and them, not relevant, or incomplete. Thus, organizing, another sub-process, is impacted since students cannot make meaning of the generated ideas, stalling the writing.

Flower and Hayes (1981) also claim that "writing is a goal-directed process" (p. 371). In the Planning stage, writers specify content goals, or goals for the final product, through the pattern labeled "Explore and Consolidate" (p. 382). The first goal is to brainstorm ideas. From there, the writer reviews the initial content goal, assesses the generated ideas with this goal in mind, and "consolidates [them], producing a more complex idea than she began with by drawing inferences and creating new concepts" (p. 382). In relation to this study, students' overall content goals are to compose a three-paragraph explanatory piece (Assignment #1) and to write an argumentative essay (Assignment #2). They will achieve this by exploring ideas through art. As they review the art with the content goals in mind, they will consolidate their ideas, readying them to "state and develop" (p. 384) to clarify new knowledge, aiding in idea expansion.

The new Hayes Process Model (Hayes & Nash, 1996) differs from the original (1981) in that it designates two main components not included in the initial iteration: a task environment (both social and physical) and the individual. The individual component accounts for memory, cognitive processes, and affective states/motivation (both intrinsic and extrinsic) (p. 4). For a writer to be successful, all these elements must work cohesively. Writers' working memory is engaged in all processes, yet it has a limited capacity to serve its functions of storage and recall. Along with a central region, responsible for semantics, working memory consists of a '"phonological loop,"' a storage area for auditory information and a visual-spatial '"sketchpad"'

(p. 8), another temporary location to hold visual and spatial information (Hayes based these ideas on Baddeley and Lewis' 1981 research.), signifying that the brain encodes and decodes images and words concurrently to determine and create meaning.

Hayes and Nash (1996) reassessed the cognitive processes: text interpretation, or internal schema derived from visual-linguistic information; reflection, which reinterprets the internal representations (in terms of comprehension and style) for further usage; and text production, which produces the appropriate output dependent upon the context (p. 13). In his research with Nash, Hayes clarifies the types of reflection that happen during planning: a specification of the path to the goal or the goal itself (p. 30). From here, writers proceed to the steps in planning, which include "representing the task" (p. 31) and resources required to complete it and "carrying out the task," (p. 32), where the writer can readjust goals as needed. Because the writer will deviate from the original method, Hayes and Nash describe the plan as a guiding "control structure" (p. 34). If the plan changes, why should writers plan at all? question the researchers. One, planning saves time in the future, and two, it leaves room for a variety of options to accomplish the goal.

Hayes and Nash (1996) distinguish three iterations of planning. Planning by abstraction asks the writer to plan only the main ideas and a general organizational structure. This can appear as a written "topic outline" to assist the writer in recalling ideas, but because of its limited scope, the writer has not wasted too much time if the plan changes as they write. Planning by analogy likens one task to another in such a way that the method used to complete it could be used for the other. Writers use this strategy when writing in specific genres since the format for most texts within the genre are similar. The third type of planning, modeling, is typically a mental process where the writer formulates ideas or prewrites sentences before writing them

down. Additionally, Hayes and Nash differentiate between process planning (the task comprehension and the strategized method) and text planning (the subject and its form) within their taxonomy. Text planning can be further divided into abstract and language planning (translation of ideas into grammatically correct text). Abstract planning breaks into non-content planning (rhetorical concerns) and content planning (a focus on ideas). Despite these intricacies, many writers disregard prewriting's relevance because they see planning as outside the task environment. However, planning assists the writer in lessening the cognitive load during text generation because the effort to retrieve information from long-term memory has already been exerted. Planning by abstraction with a focus on content is most equivalent to the prewriting within this research study.

Drawing on Flower and Hayes's (1981), Cognitive Process Theory, Kellogg (2008) proposed the Cognitive Developmental Perspective, an approach that acknowledges the cognitive strain writers' memories undergo when composing. Thus, he focuses on the "knowledge use principle" (Kellogg, 2008, p. 3), which states that if writers cannot access and apply knowledge, their writing cannot develop, due, largely in part, to the limited capacity of working memory. Kellogg proposes that success can be achieved through "demand reduction" (p. 3) within the central executive system of the brain.

The initial step required to move from the Planning process to the Translation process to (eventually) the Review process (Flower & Hayes, 1981) is to unburden writers' central executive capacity, so they can devote their executive attention to the writing task at hand. This relies either on working-memory or long-term memory, from which writers can efficiently access prior knowledge. However, because the knowledge then requires manipulation to

complement the task, the executive capacity of the working memory is overwhelmed, leading to "stuck" writers, affecting their engagement and fluency as well as the quality they produce.

Kellogg (2008) states that writers who gain "domain-specific expertise" (p. 15) will be able to access knowledge from their long-term memory when needed. He cites Ericsson and Kintsch (2005), who distinguished this form of knowledge acquisition as "long-term working memory" (in Kellogg, 2008, p. 15). In other words, writers who acquire enough knowledge regarding a topic can keep it in their long-term memory. When needed, they can access it at will, transforming the usually stagnant long-term memory into an active domain. This process relieves the short-term working memory and the demands on executive attention. In relation to this study, designing the artwork before composition allows students to learn the domain-specific knowledge by implementing the "single process" (p. 16) strategy of prewriting. Because the ideas have been generated and writing aids available, more attention can be devoted to actually composing.

Yet, to activate the relative automaticity of Kellogg's defined process, writers' cognitive states cannot be the only ones addressed. The Taxonomy of Educational Objectives: Affective Domain (1973), a reworking of Bloom's Taxonomy (1956), correlates the two states to investigate how interest, emotion, and motivation impact learning situations (Krathwohl et al., 1973, p. 57). The goal of the taxonomy is internalization and self-discovery. Krathwohl et al. begin the lowest level, *Receiving*, with *Awareness*, which in this study, is recognition of the possibility of using art as a form of prewriting. Recognition becomes *Willingness to Receive*, or give attention to, the sample artwork. When the assignment is proposed, students are likely to give *Controlled or Selected Attention* to it. At this point, if the student has "attend[ed] to the phenomenon" (p. 118), they move to the *Responding* level. First, students may display

Acquiescence in Responding, or compliance, by completing the artwork because it was assigned. The turning point is *Willingness to Respond*, which demonstrates voluntary behavior and cooperation (p. 125). In this study, students complete the entire assignment – many because they were interested. Accordingly, students may display *Satisfaction in Response*, demonstrating enthusiasm or pride. The objective for this study is to reach the *Valuing* level, at which students have begun to internalize the behavior (The taxonomy, though, continues for two more levels). Through *Acceptance of a Value*, students would appreciate the benefits of prewriting, and specifically, art as a prewriting strategy. If they reach the *Preference for a Value* level, they would be likely to use the method again. Ultimately, *Commitment* displays internalization of art as a preferred form of prewriting.

Likewise, Hayes' (1996) approach interpolates the affective state as part of the Individual component within the Process Model. Motivation, he posits, is goal-oriented (p. 9). He and Nash note various studies (Hayes et al., 1990; Cox, 1992; Palmquist and Young, 1992) that conclude students' beliefs about their writing abilities can dictate their future progress and success. For instance, Hayes and Nash (1996) refer to Dweck's (1996) research concerning growth versus fixed mindset, concluding that students who believed writing skill was unchangeable were less likely to improve (Hayes & Nash, 1996, p. 9). Another challenge in writing occurs because writers have more than one goal; a writer is tasked with various decisions before they even begin: audience, strategy, length, etc. (p. 9). Successful writers can balance these interacting goals; those who cannot tend to experience anxiety. Additionally, those who do not understand a text tend to blame themselves, not the wording (p. 11), further cultivating a negative disposition towards specific tasks. Yet, writing, like art, can be used to reduce stress, potentially improving one's affect.

Educational Significance

The purpose of this educational study is to examine whether original artwork impacts the completion and quality of students' prewriting within the writing process. This topic is of importance because it validates visual learners, provides an alternative planning method to those who struggle linguistically, and promotes creativity. Furthermore, art, in the context of prewriting, provides an authentic inroad to the writing process and maintains equity amongst multilingual learners and those with specific learning disabilities. Despite the level of scaffolding a teacher applies to a prewriting task or an outline, students still struggle to brainstorm ideas. In elementary school, teachers would encourage students to draw their ideas; this method loses traction as students age and is typically lost by high school. Learning more about the function of art as a prewriting method could redefine what is meant by brainstorming and organizing ideas. Moreover, the affective benefits of art may balance the cognitive load, reducing apprehension associated with the task.

CHAPTER II

Review of the Literature

Overview

This chapter reviews relevant literature to the primary and sub-questions identified in this study. The main research question is: *How does original artwork as a prewriting strategy impact the completion and quality of high school students' writing?* The secondary questions are: *How does art as prewriting affect students' fluency in writing?* and *In what ways does art engage students more than other forms of prewriting?* This literature review describes research studies pertaining to students from second grade through collegiate level and examines the drawing effect and affective states related to process writing.

The Drawing Effect

The Drawing Effect, discovered by Meade, Wammes, and Fernandes (2019), proposes that the act of drawing words improves memory better than the act of writing words because it encodes memory using three systems: visual, semantic, and motor.

A study analyzing the drawing effect examined the difference between doodling and "task-relevant drawing" (Meade et al., 2019, p. 28). Researchers questioned which activity could best enhance memory performance: mindless doodling, "structured doodling" (p. 28), or writing. They performed three experiments in multiple classrooms at the University of Waterloo in Ontario, Canada. All groups were instructed to pretend they were taking a test and were informed the study was interested in the best way to record information. Each group practiced its respective procedures, received the classification tone filler as a reaction time task, and had one minute to recall the words from the study. Twenty-four undergraduates (15 female, ages 17-23,

native English speakers) participated in Experiment 1 for course credit. Students freely doodled on paper (but could not draw the word) while listening to a list of 20 semantically organized concrete nouns, presented one-by-one. Results showed that doodling led to worse recall than writing or drawing pictures because, as determined by Meade et al., the task was not semantically connected to the terms that required encoding.

Twenty-four participants (21 female, aged 18 to 28) who received course credit took part in Experiment 2 (Meade et al., 2019). Here, they listened to recorded narratives roughly two-three minutes in length, monitoring them for target words in the furniture, fruits/vegetables, and transportation categories (the same wordlists as Experiment 1). According to instructions, students wrote out, doodled, or drew the target words, which were presented about eight seconds apart. Next, they listened to one complete narrative and were instructed to note 20 words from a single classification. Then participants were told the name of the category and asked to listen for those words while drawing, doodling, or writing. Subjects underwent the same retention task as in Experiment 1. The results again revealed a lower recall while doodling than drawing and writing.

Experiment 3 revisited Andrade's (2010) experiment regarding structured doodling. Based on Andrade's findings, Meade et al. (2019) hypothesized that shading in pre-drawn geometric shapes while encoding would produce a greater benefit than simply writing. Twenty-four undergraduates (13 female, aged 18-22) received course credit for their participation. Subjects followed the same procedure as Experiment 2, listening to narratives, except rather than free-form doodling, they engaged in structured doodling. Results yielded a similar recall for structured doodling and writing, both of which were lower than the recall for drawing. Thus, the researchers concluded that freely doodling during studying or thinking can lead to memory loss,

but structured doodling does not guarantee a benefit; creating a new doodle strains the brain's cognitive load rather than halting a wandering mind, thereby requiring more focus than merely shading. Meanwhile, because of its visual-motor-semantic connections, drawing initiates the memory to trace multiple representations at once.

Roberts and Wammes (2021) expanded on research by Meade et al. (2019) in questioning the validity of the drawing effect since it focused solely on concrete nouns. In this study, Roberts and Wammes tested the theory by providing subjects with abstract nouns; they proposed that despite a lack of visual referent, participants would still be able to encode terms. At the University of Waterloo in Ontario, Canada, 48 undergraduate students (38 female; one did not identify), ages 18-29 participated in the one-hour study for course credit. All participants were fluent in English and had normal vision (with or without the aid of glasses or surgery). The researchers curated wordlists based on the word's concreteness rating; the chosen words had a mean concreteness of 3.20. Students were presented with 320 words, typed in 72pt Arial font on an Acer One 10 laptop; their task was to draw 80 of these terms and to write another 80, one at a time, for 10 seconds. During the study, subjects were shown the task (to write or draw) for 1,050 milliseconds, followed by a "fixation cross for 350 milliseconds" (p. 261), and then received the "target word" (p. 259) for 1,050 milliseconds. Participants were not informed their memory was being tested. Afterwards, to ensure students used their long-term memory, they participated in a tone classification filler for two minutes and had an opportunity to ask questions before taking the "Remember-Know-New Recognition Test" (p. 262). Here, subjects had to press numbers 1, 2, or 3 to indicate whether they remembered, knew, or did not recognize the displayed word; all 160 target words were presented randomly as well as 160 "lure" (p. 261) terms, one at a time. Participants had three seconds to respond. If they did not or answered incorrectly, they would

hear a high-pitched ring. At the trial's conclusion, students were given feedback on their performance. The researchers analyzed data using a "multi-level logistic regression approach" (p. 260). Results indicated that drawing effect exists in abstract words, although its presence is greater in concrete words. However, when illustrating an abstract idea, one creates a distinct visual referent for it, encoding it in a similar manner to how the memory would encode a concrete term.

Indeed, the drawing effect transfers to other curriculums, such as history. A common assignment is for learners is to imagine the past – usually through descriptive writing – so de Leur et al. (2020) wondered if drawing recreations of the past would benefit students as much or more than writing descriptions. They set out to determine if the type of task influenced the information included, the "historical plausibility" (p. 155) of the drawn image, and the students' interest. One hundred and fifty-one ninth grade students (aged 14-16) from six classes of general and higher-level history in four Dutch schools had previously learned about ancient Rome within the past 18 months as per standard curriculum. The study took place for two sessions, one week apart. Within each class, students were divided into either the drawing or writing group for the experimental study; groups had comparable demographics. Teachers were responsible for the prior knowledge pretest data administration in the form of a 10-minute free recall response to pre-set prompts about physical aspects of ancient Rome. Researchers used a Style of Processing Scale (Childers et al., 1985), a four-point Likert scale, to gauge student preferences in learning style, which revealed 72.5% verbal to 27.5% visual preference (as cited in de Leur, 2020, p. 161). In the next session, students either drew or wrote about the Roman Forum in Ancient Rome; their task was to produce a vivid depiction of the Forum using the provided materials: a brief Roman Empire introduction text, a 3D map of the empire, a Roman street sketch, a text

description of the Forum, a quote from Plautus about the people within the Forum, and a schedule for an average Roman citizen's day. Students were allotted 20 minutes to imagine they were at the Roman Forum in 200 AD and describe what they saw either through words or in drawing. Afterwards, students completed a "situational interest questionnaire" (p. 161) to measure how engaging and valuable they found the task and answered a questionnaire with five "yes" or "no" statements (and an opportunity to elaborate), so researchers could gather opinions about the task and product. These responses became the basis for interview questions. Researchers randomly selected 16 students across the four class (eight writers and eight drawers) and paired them (one from each type of processing group) for an interview to garner insight into student perceptions.

Student drawing depictions were coded according to style: "photo-realistic" or "schematic/iconic" (de Leur et al., 2020, p. 158), and both writing and drawing were coded for historical accuracy and reproduced/additional information. Then the products were compared using an analysis of covariance, revealing that writing contained more informational elements than drawings; yet they also contained more reproduced but the same amount of original content as the drawings. Prior knowledge did not affect the style of processing either, but it did influence historical plausibility. Students who were assigned the writing task referred to the texts more, while students who drew consulted the images. An even number of students would have preferred to complete the opposite task than the one assigned. Significantly, students who drew reported more interest in the task. In the interviews, students commented that they considered the writing task to be a summary while the drawing task required critical thinking. Researchers also noted student explanations of drawings revealed unnoticed details.

The researchers proposed that because writing is faster than drawing, the addition of a few vivid adjectives can greatly enhance a description. Writing may also encourage direct copying of information, so de Leur et al. (2020) suggest replicating the study with a longer timeframe. They also advise using peer feedback or class discussions to evaluate a drawing's historical plausibility. Drawing should be accompanied by writing or an explanation to avoid misinterpretations. Researchers have come to realize that preference and ability are not one in the same, so rerunning the study with a focus on ability may yield different results. Finally, they suggest using more abstract historical topics to measure how data would change.

The drawing effect extends to science as well. Hellenbrand et al. (2019) measured the learning processes the brain undergoes when students are engaged in generative drawing via "eye-tracking methodology" (p. 1147), or how students' eyes move when learning. When students draw generatively, they illustrate a text while they read, which assists them in remembering the information. According to the authors, this happens because the brain must focus on and then correlate main points of the text to produce an accurate rendering. Eye-tracking methodology was captured with a "SensoMotoric Instruments mobile eye-tracking glasses system with a sampling rate of 30 Hz" (p. 1152). Researchers adapted ninth grade biology curriculum about the flu and the body's response for the study and presented the text in seven paragraphs, each on a separate page. They ran two experiments to compare the learning processes and outcomes of the drawing effect; Experiment 1 questioned the difference between students who read and drew versus those who read a passage with pre-illustrated images, while Experiment 2 investigated the nuances of drawing in contrast to summarizing while reading. Specifically, using posttests as a measurement tool, Hellenbrand et al. hoped to determine if the

accuracy of an image led to a higher score, if the drawing group's measurements were consistent regardless of the control group's learning method, and if drawing changes the cognitive process.

Experiment 1, a "between-subjects design" (Hellenbrand et al., 2019, p.1151) featured 52 German eighth and ninth graders, evenly divided into two groups. Experiment 2 included 35 higher track ninth grade students, 17 of whom were randomly assigned to the drawing group. Both experiments had similar procedures that took place over two sessions in a classroom, overseen by the experimenters. In the first, students were given a demographic questionnaire and a content knowledge pretest, followed by a Paper Folding Test (3 minutes) and a 10-minute verbal ability test (p. 1152). A week later, students received individual learning sessions in which they were assigned to a learning condition. They learned about eye-tracking glasses, tried them on, and had them calibrated. Each student listened to instructions, obtained a learning booklet (containing the task and completed the motivation survey regarding their assigned task) and writing implements, and began to learn the material. The drawing group received a pre-drawn background and a legend, displaying eight necessary elements to include as well as a drafting desk to work on. The summary group's instructional support included key words and lines on which to compose the text.

After students completed the task, all materials were removed, a usability survey to measure whether the glasses affected performance, and three posttests: retention, transfer, and drawing, were distributed. Scoring for paper materials was based on a checklist and expert drawings; raters awarded points when students identified and represented important ideas of the reading accurately. Eye-behavior was measured using areas of interest (AOIs), pre-determined areas on the page in which focus is tracked. Researchers established four indicators of cognitive processing: rereadings, which measures the focus on words; focused fixation time, which

examines how much time is spent on specific content; transition rate, which demonstrates integration of ideas; and meaningful transitions, which calculates the attempts to correlate the text and images (Hellenbrand et al., 2019, p. 1154).

Results of Experiment 1 demonstrated that students who read and completed generative drawings showed a greater number of words reread, a larger number of fixations on key words, and more transitions between words and drawing than those who received the passage and pre-drawn illustrations or the passage and wrote summaries. Using an analysis of covariance, researchers determined the drawing group's retention level was greater than the picture group, but their scores on the transfer posttest were about equal. Additionally, because the drawing group had already drawn an image, their posttest drawing scores were higher; Hellenbrand et al. (2019) attributed this result to time on task, which caused them to wonder which cognitive process students used when drawing. After a correlation analysis, researchers established that students' drawing accuracy had a direct effect on their retention of information due to the number of readings and focus on key ideas. A Mann-Whitney test was performed, which revealed those who drew looked from the blank space to the text often, attempting to correlate the image in their mind to the passage. A t-test indicated that the visualizations in their minds were more accurate, suggesting a greater meaningful transition rate.

Experiment 2 measured the same components testing drawing versus summarizing. Findings show little difference in retention and transfer rates. Students assigned the drawing task, once again, performed better on that portion of the posttest. However, researchers declared both methods led to an equal amount of learning. Noted differences in replication of the drawing study reveal that students who summarized took more time to complete the task than those who drew, negating the "time on task" assumption made after Experiment 1. Furthermore, the posttest

drawing accuracy score from drawers related to retention and drawing, but not to the transfer results; yet summarizers' scores yielded no evidence that summarizing can be a predictor for learning outcomes since the summary accuracy score did not transfer to retention.

In regard to eye-tracking patterns, researchers concluded there was little difference between the drawing groups in Experiments 1 and 2. The summarizers had a higher number of text rereadings and a greater transition rate when making connections, but the drawing group focused their attention on key parts of the text and created more meaningful transitions. Thus, eye patterns do differ for each task, but researchers acknowledged the need for further research to reconcile why the different learning processes did not yield distinguishable outcome measures. Researchers advise more studies on how generative drawing can improve transfer of information, and they declare a control non-drawing group is a necessity for accurate data comparison.

In another study, Traue & Stewart (2022) designed the Art Infused Literacy Project to test the theory of transmediation, or the "translation" of a language from one form to another. Specifically, Traue wanted to determine if art skills were taught simultaneously with similar writing skills, would they provide a scaffold for writing, and which skills would lead to transmediation. Traue taught a seven-week unit, comprised of 10 lessons taught to 14 second graders in a rural Title I school who attended art twice per week for half an hour. The final project of the three phases was a four-page illustrated book. The first three lessons focused on visual and written sensory details as well as establishing a written baseline. Students wrote a sentence about a favorite summer activity and drew a picture to represent it. After the lessons, they returned to this sentence to add sensory detail to it. The next three lessons worked with the concept of "zooming in" (p. 8), or looking closely, at artwork and then transferring the skill to writing. During this phase, students completed resist painting (a crayon drawing painted over

with watercolor) and focused on word choice to describe the painting. Final lessons taught students to generate original story ideas, understand story structure, and create the accordion book. Students designed Heart Maps for brainstorming and referred to them throughout the writing process.

Traue and Stewart (2022) implemented descriptive evaluations methods. After Phase 1, the mean sentence length increased from 5.7 words to 10.9 words (p. 12), and the length increased again after Phase 2 from 10.9 to 14.4 words (p. 13). Additionally, the quality of writing progressed as students included more sensory details and "silver dollar words" (p. 8), and students were highly motivated as noted from observational data. After lessons four-six, there was clear evidence of transmediation as students were able to "zoom in" on the artwork and then transfer those descriptive skills to writing. Using the 6+1 Writing Traits Rubric by Education NorthWest to assess the narrative writing, the researcher hoped that students would continue to use descriptive words in their final project, but this was one category where they did not rank as capable. Traue (2022) lists the length of the study as a limitation, stating that with more practice, students may have performed better in the Words and Phrasing categories since there was evidence that after the creation of visual artwork, students' word choice improved. Researchers suggest incorporating visual strategies into English classrooms to engage students and scaffold literacy skills.

Writing Induced Affective States

Affective states are emotions or attitudes that impact one's ability to learn. Zumbrunn et al. (2017) studied how writing influences students' affective states. Specifically, the researchers worked with eight fifth grade classrooms in two elementary schools in a diverse suburban

Southwestern city. Teachers asked 114 students to illustrate their emotions about a recent writing experience and then describe the drawing in writing on the back of the paper. The study took place in one sitting, but participants were provided with an unlimited amount of time to complete the task. Researchers implemented "inductive category development" (p. 668) to analyze the submissions for thematic similarities, applied a "feature code" (p. 668), and calculated the code's frequency; four thematic categories emerged. The first category, "Students Draw and Write About Their Emotions" (p. 669), discovered more than 50% of the population referred to joy as the dominant emotion, while other students mentioned and drew images of more negative emotions such as apathy, boredom, anxiety, frustration, and anger. When examining "Who Students Depict in Their Drawings" (p. 669), Zumbrunn et al. noted many students drew themselves in isolation, indicating that they view writing as a solo activity. One-fourth of the drawings included a teacher, who was either standing near (more positive perception) or far from (more negative perception) the student. Researchers calculated that 50% of students represented some type of engagement, developing the "How Students Depict Engagement" (p. 669) category. While 25% of the students showed active engagement, others portrayed themselves as disengaged. (Of note: Students who mentioned prewriting stated it was a helpful strategy.) Finally, the category, "Students Draw and Write about Their Writing Motivation" (p. 669) confirmed that students are more likely to engage when there is choice or when they have interest in the topic. It also reaffirmed that students' writing confidence – whether high or low – impacts the effort put forth. Researchers concluded both drawing and writing are required for a full explanation of students' affective states as the drawings can reveal details students do not or cannot put into words. They also advise implementing other methods of gauging students' perceptions of writing to establish and maintain an equitable classroom.

Affective states influence older students' writing as well. Abdul Hadi et al. (2024) issued a survey to 169 respondents from The Centre of Foundation Studies, Selangor Branch at Dengkil Campus in Malaysia. Participants (30.8 % male and 69.2% female) were drawn from a random sampling of students associated with the Law, Engineering, and Science departments enrolled in an English I Foundations course. English was not the participants' native language, but they needed to pass the Malaysian English Test, which features an Extended Writing section, to gain admission to the university. Researchers desired to understand how learners perceive their own writing difficulties and writing process in academic writing. To accomplish this, they adapted a 5-point Likert scale survey template (Flower & Hayes, 1981; Petric & Czalr, 2003), which was originally designed by Yunos et al. (2023). The survey included three sections: demographics, writing difficulties, and writing processes. The self-reported demographic profile presented 73.4% of students as "average users of English" and 29.4% as "good English users;" moreover, nearly all students earned an A or B average in their English course (pp. 7-8).

The Writing Difficulties section (Abdul Hadi et al., 2024) asked six questions. Quantitative results revealed that learners struggled to set goals for themselves, grappled with content knowledge or the rhetorical situation, and labored to generate ideas. Students also stated that unfamiliarity with the rhetorical situation in addition to uncertainty about what points should be covered in each paragraph made students feel as if they could not achieve the goal of the essay. Regarding learners' perceptions of their own writing processes, students revealed that they were typically unaware of what to write after reading a prompt. To remedy this, they reviewed model texts for clarification, reworded instructions, and brainstormed ideas. Some created an outline, while others only had a mental plan. Most learners do not begin academic writing without a plan, reiterating the necessity of the prewriting stage. Although the survey asked

students about their thoughts during and after writing, my concern is with the “Before Writing” (p. 6) phase. It is during that phase where students seem to struggle the most. Researchers suggest more guidance from teachers is required for students to internalize prewriting skills. Additionally, they advocate for further investigations on the writing difficulties faced by English language learners.

Even so, there is still reason for Yunus et al. (2018) to question students’ awareness of and willingness to implement prewriting strategies. Researchers distributed surveys to 30 secondary school students from the Science and Arts route at Menara Gading Academy in Pahang, Malaysia. All selected students were not native English speakers but had learned English in school. Results of the survey were analyzed using a quantitative research design. Data revealed that 53.3% of students initially felt uncertainty towards prewriting as a concept; meanwhile, 46.7% acknowledged that prewriting could involve multiple steps (p. 2219). A survey question asked students if participants brainstormed or engaged in planning before writing; fifty-three percent stated they used brainstorming while 60% admitted they typically had a plan before they began to compose (p. 2220). From this data, Yunus et al. (2018) concluded that students do, in fact, prewrite, yet they are unaware that the strategies they use are labeled as forms of prewriting.

Survey data also revealed that students who prewrite have more positive perceptions towards the writing process and are more confident writers. They find their writing to be more organized, and 60% concurred that prewriting supports writing fluency (p. 2221). Students realized that prewriting during a timed examination wastes less time and enhances the structure of their writing. Researchers propose that prewriting strategies must be consistently practiced in the classroom and at home. If instruction does not draw attention to what qualifies as prewriting

or the different methods of prewriting, students could miss out on vital chances to improve their writing and thinking skills.

Furthermore, Alemu (2020) sought to improve students' idea generation skills by experimenting with various prewriting strategies, hoping new methods would positively impact students' perceptions of the prewriting stage. Using action research design, Alemu recruited 81 first-year computer science computer students from his English Language Basic Writing Skills course at Harmaya University in Ethiopia. Students were divided into two groups; a lottery system selected Group B for the research trial observation (A colleague observed the group for six one-hour sessions during the pre-intervention phase.), from which nine students of varying academic ability were chosen for a focus-group discussion. Observations noted that students did not favor or use prewriting strategies. This revealed a lack of idea organization and coherence in student writing as 22% of students were seen replacing original writing (p. 42). "Pen pauses" were observed in 70.7% of students, later confirmed by discussion to be the result of a lack of prior knowledge. Fifty-six percent of students stalled when trying to compose (p. 42). Furthermore, 77.7% of the focus group concurred that although they had an idea, they were unsure how to begin writing it (p. 42). All discussion participants agreed that at no time during their educational careers had they tried to implement idea generation strategies even if they had previously learned them. To measure the pre-intervention phase, the researcher developed a thematic framework to analyze the discussion transcript and observation notes to gain further data about the initial problem.

During the eight-week intervention phase, Alemu introduced prewriting strategies such as brainstorming, questioning, clustering, and listing and gave open-ended practice assignments. In total, students received 16 hours of instruction as each task took approximately one hour. Data

was collected via observation checklist, questionnaires, and focus-group discussions to assess the usefulness of the intervention strategies, and it was evaluated comparatively. Seventy-three percent of the class responded that they found prewriting methods helpful while 92% (p. 44) agreed that the strategies are critical for writers to compose a text. Overall, 56% of students (p. 56) favored brainstorming, and many preferred this method because they could discuss ideas with others. Alemu concludes that prewriting strategies require time, but it is time well spent as his students were able to produce coherent and complete paragraphs post-intervention. Thus, prewriting should not be rushed, and teachers should ensure students comprehend multiple strategies, so students can choose the one that works best for them.

Since prewriting is the first stage in the writing process and its benefits are well-documented, Bayat (2014) explored whether the process writing (Flower & Hayes, 1981) model had significant impacts on students' levels of anxiety and success. Thirty-eight first-year preschool teaching students from Akdeniz University in Turkey formed the experimental group, while 36 first-year students composed the control group. Participants in each group self-reported equal levels of anxiety and success when writing. Bayat implemented a quasi-experimental design that included a pre-test-and posttest. During the ten-week research period, the control group used traditional writing methods: they learned about writing, wrote weekly on teacher-chosen topics, and received written feedback with little verbal communication. The experimental group utilized the process method: they learned the method, received a checklist with the steps and guiding questions, engaged in peer review, and had two weeks to write an essay with teacher guidance. On the final day, students first took the Writing Apprehension Test, a Likert scale survey, from which data was statistically analyzed using analysis of covariance. Subsequently,

students wrote an essay, which was evaluated by academic staff with a checklist for content, language use, word choice, and organization.

Results revealed that the process approach positively affected students' writing success. Students in the experimental group received lower scores on the Writing Apprehension Test than the control group, indicating the new approach reduced anxiety. They also averaged a higher score on written expression, denoting that they were not plagued by as much anxiety as the control group. Data also determined that the process approach led to fewer errors in the writing of the experimental group, which may have reduced their overall anxiety and led to more positive views about writing. While Bayat (2014) acknowledges the success of the study, the researcher also notes that the process approach cannot change students' psychological characteristics, so more complex studies are suggested.

Continuing to acknowledge the psychology of writing, Bastug et al. (2017) examined the phenomenon of writer's block and sought to determine the experiences and perceptions that caused it, the ways in which writers experience it, and the impact it has on students. Thirty-two education students at Niğde University in Turkey (average age 21; six male, 26 female) partook in the 2014 study; they were informed of its purpose and process. Researchers used a qualitative research design known as the phenomenological design since their purpose was investigative in nature and their focus was to explain the commonality between participants' experiences. Data was collected via focus group interviews consisting of eight participants who were asked five pre-prepared questions in an hour and a half time span. Responses were recorded, and researchers acted as moderators during the interviews. Afterwards, the data was transcribed to paper and an "interpretation-based content analysis" (p. 608) performed. Results showed a range of possible causes, processes, and effects related to writer's block.

Bastug et al. (2017) discovered the "school life-educational process" (p. 609), which includes dull, repetitive tasks; over-testing; and limited opportunities to write as major causes. Teachers may also contribute to writer's block if they are not supportive of students' needs, exhibit negative attitudes towards writing, or do not provide feedback. Furthermore, students' responses noted they became blocked when they felt controlled, did not have appropriate knowledge of the subject matter or text type, lacked confidence, or feared criticism. Participants revealed writer's block could result from an assignment being graded, the space in which a student is expected to write, time limitations, writing form, and content requirements; for many, these issues coincided with students' attempt to craft an introduction. Writer's block causes affective states such as feelings of failure and stress. These students are also likely to avoid or procrastinate writing situations to negate those emotions. The researchers close the study by encouraging teachers to adapt new writing procedures to cancel writer's block. First, students should choose where they write because the place may provide a distinct motivation. Students should work in writing groups for motivation and idea generation. Beginning with body paragraphs rather than the introduction may develop more confidence. Long-term projects allow for more time and creativity. Additionally, since many students find informative writing boring, teachers may choose for students to have a positive experience with fiction before moving onto the informative genre.

Another cognitive measure that influences writer's block, and thus, writers' affective nature towards writing, is fluency. Unlike speech, which has defined criteria, there are various approaches to determining writing fluency. In general, though, for one to be considered writing fluent, they must compose accurate (both in length and quality) text quickly with minor revisions. Van Waes and Leijten (2015) reference Kellogg's (1996, 2004) theory about how

more planning leads to less cognitive strain during the transcription phase, yielding a higher fluency rate (p. 80). They argue that while the '"words per minutes'" (p. 81) theory is valid for a product-based approach, new technology, like keystroke logging can measure inter-key data such as the number of characters and revisions, providing a process-based approach. Thus, their research study implements this method to explore fluency from different perspectives. P-bursts, or writing production between two pauses, is a concept discovered by Hayes and Chenoweth (2006), which states that the longer the run of composition without a pause, the more fluent a writer. The traditional pause threshold is two seconds, indicating that any writer who stops for more than that length of time is doing more cognitively than retrieving information and transcribing it.

Van Waes and Leijten (2015) set up a quasi-experimental study at the University of Antwerp in Belgium with 84 participants (67 female, 17 male; mean age: 22.55 years) who composed two expository writings (one in their native Dutch and one in a second language). Participants were students in the Master of Multilingual Professional Communication program enrolled in one or more advanced foreign language course on a B2 level (fluent). The writing prompts were described as "knowledge-telling" and required no outside knowledge. They were analyzed from the product and the process approach through the examination of keystroke data (pp. 81-82). Data was collected in a computer classroom during three separate timeframes with 30 students each. Students received both oral and written instructions for the within-subject design study. Participants had two minutes of planning time and eight minutes of writing time. The researchers included a distraction task between the two writing pieces and asked students to complete a post-writing survey.

Van Waes and Leijten (2015) used InputLog 5, a computer program that collected all keyboard and mouse writing production with timestamps. Researchers combed metadata for general analysis (linear log of each change), summary analysis (statistical summary data) of total process and pause time, the number and average length of the pauses, the number and duration of the P-bursts, and pause analysis (the number, length, location, and interval of the pauses). Analysis procedures included General Linear Models, correlation analysis, and Principal Component Analysis (PCA). To begin, researchers narrowed fluency variables from 200 to 50 based on proportions, means, and ratios. Next, they figured the degree of correlation between the variables and categorized them into eight groups based on both process and product measures. A representativity evaluation was completed; the variable set for PCA analysis numbered 13. Lastly, researchers performed a reliability check with Cronbach's Alpha value (p. 84).

Results established that students are more writing fluent in their native languages which Van Waes and Leijten (2015) acknowledge is not a new find. However, their interest lies in the determination of which factors are responsible for this difference in fluency. Using the common approach, words/characters per minute in the final text and during the writing process, they found a larger effect size at "the character level" (p. 85): Students were approximately 20-25% more productive in Dutch than in their second language; they used 14% more words in their native language. Revision was close to 100% in L2 compositions. Exploring the pause and P-burst data, researchers concluded that second language writers use a more fragmented approach to composition, but they still produce fluid, albeit shorter text units.

Furthermore, Van Waes and Leijten (2015) comment on the "variability of the writing process" (p. 87) and believe that fluency is not a stable measure throughout the process. To test this, they divided the writing process into 10 equivalent intervals, calculated the number of

characters written, and inputted this information into a formula that hypothesized the normal maximum text production rate per minute for an expository text as 400 characters. This test determined that L1 writers produce more characters per interval, yet fluency during the middle intervals does not vastly differ between L1 and L2. A second approach uses a "*task maximum* to express an individual text-production measure" (p. 88) to account for typing speeds. Researchers analyzed the interval data from the L1 expository text and calculated individual participant task maximums. They compared this with the actual text-production rate per interval and concluded that students (both L1 and L2) had a slower typing speed than calculated, which tended to peak at the start of writing production.

The PCA analysis delivered four components. Researchers interpreted them using an oblique rotation (Oblimin with Kaiser Nominalization). Internal consistency measures were deemed reliable, so Van Waes and Leijten (2015) formulated a multi-dimensional fluency model based on Production, Process Variance, Revision, and Pausing Behavior. Using this framework, the researchers reanalyzed the L1 and L2 expository texts in a General Linear Modelling (GLM) repeated-measure test. Results revealed writers composing in their native language are more fluent; the only measure for which the study did not find significant differing data was pausing behavior.

Overall, Van Waes and Leijten's (2015) study concludes that native writers are more fluent at the start and end of a writing piece; during the middle of a composition, there is a negligible difference between first and second language learners. To further validate this theory, the researchers acknowledged their small sample size and state their intention to set up a larger study to include more participants, genres, and contexts, including ones where common interruptions like emails are prevalent. They comment on the necessity of standardized analysis

procedures pertaining to Inputlog. Some suggested areas of research include educational developmental and intervention studies, planning strategies, translation studies, and writing fluency and text quality.

In a final study, de Milliano et al. (2017) inquired whether talent led to engagement, if engagement could be developed as writing skills grow, or if a lack of engagement can explain insufficient writing improvement over time. Researchers studied the cognitive, affective, and behavioral engagement in lower-level literacy and social studies students from seventh through ninth grade as they were taught targeted writing lessons meant to improve their skills. Researchers chose these grades in hopes of determining if this grade band amounted to significant growth. The three-year longitudinal research included 63 students from 10 classes in nine diverse schools in the lowest secondary Dutch education tracks; special education students were excluded. Thirty-two of the students were native Dutch speakers, while the rest of the 12–14-year-old participants held various linguistic backgrounds.

Students received three realistic relevant writing tasks, commented on them, and the ones that received the most positive feedback were selected for the study. Students took the writing proficiency exams in their classrooms over two 45-minute class periods in the Spring of each year. The three assignments covered instructive, argumentative, and narrative writing styles. All students completed each assignment. For Assignment 1, students wrote a letter of advice to someone their age about to visit the Netherlands for an exchange program. Assignment 2 asked students to imagine they were part of a competition in which they had to collect candy wrapper coupons for free movie tickets, but they were unable to find any; students were instructed to write a persuasive letter to the company to convince them to send them the tickets anyway. Finally, Assignment 3 required students to compose a narrative sequel to a previously read short

story; they received a start and a closing sentence. Graders used a "primary trait scoring procedure" (p. 699), which accounts for the main objective and sets a rating criterion. They also received a scale with five benchmark texts to compare the writing and arrive at a single score. Scores for each grade were added to represent writing proficiency across the three years.

To measure engagement, de Milliano et al. (2017) adapted the Dutch Institute of Testing's Affective and Cognitive Attitude Scale toward English as a school subject survey (p. 699). Affective questions related to students' opinions about their self-efficacy, intrinsic value, and usefulness. Cognitive questions focused on self-regulatory behavior and effort when employing reading and writing strategies based on metacognitive models from Baker and Brown (1984) and Pressley and Afflerback (1995) and the process model (Flower & Hayes, 1981), respectively. Students answered the questionnaire in the fall semester for one 45-minute session. Students responded using a five-point scale; the scores from each grade level were added, yielding a representative score. Observational data was collected during daily Language Arts and Social Studies classes for one lesson in each subject during each semester, providing researchers a total of 12 class periods of data per student.

Results revealed that students believe literacy lessons are useful, and they have acquired confidence in their abilities; both categories averaged about a four on the five-point scale (de Milliano et al., 2019, p. 703). However, students do not always enjoy learning literacy, as evidenced by its mean score of three. Also near the middle of the scale were perceived effort and self-regulation averages. Observed data showed more time was devoted to literacy, and more students were on task in language arts classes. To determine whether engagement affects writing development, researchers implemented Pearson correlations, which states writing proficiency in social studies has a significant correlation to intrinsic value and time-on-task but does not display

significant correlations for language arts for any variables. Yet, students' writing skills improved within three years' time, most significantly between seventh and eighth grade (p. 703). Researchers used a means of linear regression to calculate the relationship between students' writing development and engagement throughout the three-year span. They found that the grades from prior years' best predicted writing proficiency, and none of the engagement variables had a significant contribution on students' writing development. Thus, even though intrinsic motivation may have been a factor in lower achievers' writing development earlier on, it no longer has the same impact, even if its remnants remain. Although no correlation was found between perceived effort and perceived self-regulation as the researchers had hypothesized, they believe their study contributes to the distinction between students' writing level and their writing development, which they define as separate performance standards that are not impacted by the same affective and behavioral variables. Researchers suggested future studies expand the nature of the studied variables, correlate the relationship between task difficulty and self-regulatory behavior, and investigate the quality of the students' learning environment.

Summary of the Literature Review

This section provides a summary of the studies used in this literature review. Studies were selected for this literature review based upon the main research question: *How does original artwork as a prewriting strategy impact the completion and quality of high school students' writing?* as well as the secondary questions: *How does art as prewriting affect students' fluency in writing?* and *In what ways does art engage students more than other forms of prewriting?*

Most of the studies were conducted outside of North America, and many of those took place in countries where English is not the predominant language. Thus, numerous, but not all, studies included English language learners as participants. While this may have impacted results, writing is still a universal language of communication. Yunus et al. (2018) and Abdul Hadi et al. (2024) researched in Malaysia, while the studies of Bayat (2014) and Bastug et al. (2017) originated in Turkey; de Leur et al. (2020) and de Milliano et al. (2017) researched in the Netherlands and Van Waes and Leijten (2015) in nearby Belgium, while Hellenbrand et al. (2019) gathered participants in Germany. Alemu (2020) worked in Ethiopia, and Meade et al. (2019) and Roberts and Wammes (2021) experimented in Canada. de Milliano et al. surveyed, observed, and assessed students for three consecutive years to conclude that affective states may not play as large a role in writing development as they do in writing ability. While the survey itself has similarities to the one used by Abdul Hadi et al., who discussed how students perceive their writing process and their writing difficulties, their conclusions about student perceptions of writing disagree. As noted in Abdul Hadi et al.'s study and in Bastug et al. 2017, students have the most difficulty composing the introduction. Alemu concurs with this finding as his study presents students grappling to brainstorm; instead, they engage in "pen pauses," which take on a new meaning as a component in Van Waes and Leijten's study using keystroke data to calculate writing fluency. Furthermore, Yunus et al.'s survey revealed that many students are unaware of the prewriting process even if they know the strategies, but they do agree that prewriting aids writing fluency. However, none of the research reproached the concept of prewriting, and most participants praised its helpfulness. Therefore, the research studies suggest teachers should incorporate more prewriting into their instruction to aid students in the planning phase to ease the

cognitive and affective strain during translation; to accomplish this, adequate in-class time to teach and master these skills is required.

Other research studies concentrated on the benefits of drawing. Traue and Stewart (2022) sought to improve writing skills through the study and creation of original artwork. While they had moderate success in their goal of transmediation, students did show an increase in engagement and motivation. Likewise, de Leur et al. (2020) surveyed students who completed a drawing-related task about their interest in the writing process; students who drew noted far more engagement than those who were assigned writing. Zumbrunn et al. (2017) studied students' affective states about writing through their drawings and written interpretations of said images. Researchers concluded that student drawings revealed more distinctive details about students' feelings than writing alone. Meanwhile, Hellenbrand et al. (2019) suggest students who create generative drawings while reading are more likely to internalize the passage's meaning because they will refer to the key details in the text to aid in the accuracy of their illustration. Furthermore, Meade et al. (2019) and Roberts and Wammes (2021) address drawing and writing in terms of cognition and memory. Meade et al.'s study examines the impact of doodling, structured doodling, and writing on memory, while Roberts and Wammes look at how an idea's concreteness value impacts one's ability to remember it through drawing. Both studies suggest that task-relevant drawing is necessary for memory encoding. Thus, in relation to Traue and Stewart's (2022) work, drawing descriptive details in an illustrated book should have aided students in producing more descriptive stories since the concept of sensory language had been previously encoded in their long-term memory. de Leur et al. (2020) questioned whether their study would incur the same results with a more abstract historical topic; according to Roberts and Wammes, concrete items are encoded more easily, but the drawing effect still aids abstract

concepts, so this element might aid in more original drawings. Lastly, Zumbrunn et al.'s experiment (2017) saw the impact of drawing on cognition as students were able to reproduce task-relevant, concrete vivid illustrations of an experience. Therefore, task-relevant drawing not only assists memory encoding because it requires more focus on the external stimuli, but the nature of art also encourages students to reveal their inner emotions, which, when paired with writing, is capable of transmediation.

A variety of topics were researched for this literature study due to a lack of available information on the main topic. This led to vast contrasts within the studies. To start, topics ranged from drawing and writing (de Leur et al., 2020; Hellenbrand, et al., 2019; Traue & Stewart, 2022) to prewriting (Abdul Hadi et al., 2024; Alemu, 2020; Yunus, 2018) to affective states (Bastug et al., 2017; Bayat, 2014; de Milliano et al., 2017; Zumbrunn et al., 2017) to memory (Meade et al., 2019; Roberts & Wammes, 2021) to fluency (Van Waes and Leijten, 2015). This expanded the original scope of the research question. Additionally, the research participants of each study varied in age from elementary and secondary school (Abdul Hadi et al., 2024; de Leur et al., 2020; de Milliano et al., 2017; Hellenbrand, et al., 2019; Traue & Stewart, 2022; Yunus, 2018; Zumbrunn et al., 2017) to university (Alemu, 2020; Bastug et al., 2017; Bayat, 2014; Meade et al., 2019; Roberts & Wammes, 2021; Van Waes and Leijten, 2015). Such a variety in age groups will help confirm the reliability of my proposed concept. Furthermore, not all research designs required a writing or drawing sample; some requested only a survey (Abdul Hadi et al., 2024; de Leur, 2020; Yunus, 2018;), others asked participants for samples of writing and drawing (Bayat, 2014; de Milliano et al., 2017; Traue & Stewart, 2022; Zumbrunn, 2017); some solely focused on composition (Van Waes & Leijten, 2015); and the rest split students into groups (Alemu, 2020; Bastug et al., 2017; Hellenbrand, et al., 2019; Meade et

al., 2019; Roberts & Wammes, 2021). The results of each type of study provide further insight into student perceptions on the writing process, providing teachers with valuable information to better support their students' needs.

Overall, the research indicates that The Drawing Effect increases retention because Task-relevant drawing assists memory encoding as it requires more focus on the external stimuli. The nature of art positively impacts students' motivation and effort when paired with writing since it encourages students to reveal their inner emotions, which can lead to written transmediation. Thus, students who prewrite experience more positive affective states during composition, which has a direct impact on their writing success. Students with a growth mindset are more likely to combat cognitive strain by implementing different measures and strategies that could ease writers' anxiety, prevent writer's block, increase fluency, and engage their acquired confidence. The research studies suggest teachers should incorporate more in-class prewriting into their instruction to aid students in the planning phase to ease the cognitive and affective strain during translation.

CHAPTER III

Research Design

Introduction

Despite the level of scaffolding teachers apply to prewriting tasks or outlines, students still struggle to brainstorm ideas. They waste time trying to arrive at the perfect idea or attempting to remember every detail. Others read the prompt and do not know how to begin. If students start the writing process demotivated, their affective state will likely compromise their success.

This chapter explains the research designed to investigate the primary and sub-questions identified in this study. The main research question is: *How does original artwork as a prewriting strategy impact the completion and quality of high school students' writing?* The sub-questions questions are: *How does art as prewriting affect students' fluency in writing?* and *In what ways does art engage students more than other forms of prewriting?*

In elementary school, teachers use interactive methods, like art, to stimulate students' minds. The same process can inspire high schoolers, providing them with concrete ideas to which they can refer during composition.

The research method of this hypothesis-generating study required the analysis of numerical data along with subjective evaluation of existing content collected from daily instruction. Thus, the triangulation design implemented in this study used a constant comparison method that identified patterns within and across data sources. The anticipated outcome of the research was to determine that original artwork is a valid prewriting strategy for high school students. As the teacher-researcher and participant-observer, I hypothesized that the use of an interactive method, such as artwork, will stimulate students' minds, preparing them with

concrete and internalized ideas that should enhance the quality of their writing and affective state while limiting the strain on their short-term working memory, thus demonstrating more fluent writing, leading to a greater quantity of student completion.

Research Setting

This section presents the setting for this research study. This study is designed to answer the research question: *How does original artwork as a prewriting strategy impact the completion and quality of high school students' writing?* The secondary questions are: *How does art as prewriting affect students' fluency in writing?* and *In what ways does art engage students more than other forms of prewriting?*

This research study was set in an urban-suburban town located in Northern New Jersey, not far from major cities, with an estimated population of 18,000 people (Official Site of The State of New Jersey, n.d.). About 60% of the residents are white, 20% identify as Hispanic or Latino, 10% are Black, and the remainder are of various ethnicities. Most households speak English as a first language; Spanish is the second most spoken language. The town is mainly middle class, although about 5% of its population lives below the poverty line. Approximately 65% of residents own their homes, while 35% rent.

The town's school district has a district factor rating of GH. It serves about 2,100 students from pre-K-12 across five schools. The district employs 170 teachers, most of whom achieve tenure. The researcher is one of 13 English/Language Arts Literacy teachers. During the 2024-2025 school year, there were seven sections (roughly 165 students) of ninth-grade English, two of which the researcher taught. State testing results for 2024-2025 have not been released yet, but in the prior two years when the researcher was responsible for teaching one or more

sections of ninth grade English, the students' standardized testing scores met or exceeded the ELA Proficiency Rate for Federal Accountability.

The high school where the research data was collected is home to approximately 650 students, 35 of whose work was analyzed for this study. The school has 49 teachers, nine of whom work as Special Educators with the 17% classified student population. The school itself is predominantly white, about a quarter Hispanic/Latino, a third Black, and sixth Asian. The high school offers Career and Technology programs; nearly 8% of the student population takes part. It also participates in numerous AP programs and offers a collegiate academy. However, despite its offerings, many of the higher achieving incoming first-year students choose to attend nearby magnet schools to focus on specific career goals.

Research Participants

As a participant-observer, it is important to note that I have been teaching English/Language Arts for thirteen years at the secondary level. I taught eighth grade for nine years and high school for four years. I have been in my current district for eleven years and have been working at the high school for three years. Because I have worked with this age group (eighth-ninth graders) for many years, I can understand their thought process, decipher general looks of confusion, and interpret their affective states from slight reactions. I am confident in my ability to teach writing to students using established techniques, but I would like to further engage students in the art of written communication.

There were no human participants in this study. Instead, data sources were drawn from one general education and one inclusion ninth-grade Literature class that I taught during the 2024-2025 school year. Because the focus of this study is on general education students, the

special education students' work was not considered at the time. The work samples were collected as part of normal instruction from 35 students. One set of data was taken in early May and the other in mid-June.

Data Sources

The basis of my research was a document analysis without the involvement of human subjects. Existing data sources used for the study included two sets of original artwork and two writing samples associated with each art piece. Data was collected on paper and via Google Docs. Thirty-one of thirty-five students submitted the first assignment. The second assignment was given as a part of the classes' final examination, and all students submitted it.

The original project, based on William Golding's (1954) *The Lord of the Flies,* asked students to consider the mask, the character, Jack puts on before hunting. In the novel, the mask permits the boy to subdue any feelings of shame or guilt while he mercilessly kills a boar; the mask accentuates his inner savagery. Students were assigned a project in which they had to design a mask to represent a persona for themselves, a character in *The Lord of the Flies* or in another novel, or for a universal theme. Once they chose the subject, students were to determine at least four symbolic representations of this persona, draw them on the (pre-distributed template) mask, and then color the mask with strict regard to color psychology and symbolism. This original artwork served as prewriting. Students worked on the art for one 42-minute class period and were instructed to complete the remainder of the art at home. The masks were collected in class the following week.

The second step was to examine the mask and compose three quality paragraphs about it. The first required students to describe the chosen symbols in their own words and explain what

they represented. The second paragraph asked students to consider how wearing the mask would change the wearer's personality and their public persona. Finally, the third paragraph implored students to critically think about the use of color and analyze why the subject would include it as part of the representation of themselves. Students received bullet-pointed instructions and a Google Doc. They had one week to compose the paragraphs on their own time and submitted them via Google Classroom. (This project was adapted from a Weebly post by eighth-grade English Language Arts teacher Michael J. Fejes; see Appendix F.)

As part of students' final exam, they prewrote for an essay with the following prompt: "Who or what is responsible for the tragedies in Shakespeare's (1597) *Romeo & Juliet?"* Students received a tombstone template and were instructed that prewriting must only consist only of images, single words, or phrases from the text of no more than six words in length. They were encouraged to add color like they did for the mask project, and the teacher reposted the same color psychology slide deck to Google Classroom for student reference. The prewriting was started in class and completed at home. One class received four days to work on the prewriting, and the other had eight days due to the final exam schedule. Students were responsible for bringing the prewriting to the exam.

Students composed the essay on Google Docs during the final exam on their iPads. Depending on how they managed their time, students could have up to 45 minutes to write. The essay directions indicated students should compose a short introduction of two-three sentences with a thesis statement. Next, they should write two-three body paragraphs with evidence drawn from the tombstone. Students were directed to analyze this evidence in support of their thesis and were given three guiding questions to assist them. Finally, they were reminded to include a two-

three sentence conclusion with a closing transition. Students submitted the essay to Google Classroom upon completing the exam.

Data Analysis Procedures

This section presents the data analysis procedure for this study. There were four documents collected as part of the research: two writing samples and their respective prewriting artwork. Writing was submitted through Google Classroom, whereas the prewriting was turned in on paper. The rubric that was designed and implemented for Assignment #1 was then adapted for Assignment #2 to maintain consistency in the grading procedure despite a change in writing genre.

For the content analysis of each writing sample and its prewriting counterpart, I coded and categorized qualitative data, transforming it into numerical data. I examined the final drafts for completeness, the date turned in relative to the due date, and the quality of the writing. I then compared these findings to the qualitative values (ideas, directions followed) and qualitative (how much) effort made in the prewriting. To measure the impact on fluency, I compared the amount written (sentence count, character count) to the time spent writing, which could be traced via Google docs Revision History and a Google Doc extension, Process Feedback. Additionally, I explored students' cognitive writing process through a review of their writing bursts and pauses. Due to the vast recorded total typing times, students were grouped by time frame, so their scores and paragraph and character counts were analyzed as averages. I explored the exhibited level of students' cognitive and affective engagement by coding my feedback to students and analyzing their overall assignment grade, and, in conjunction with an examination

of the neatness and focus of their prewriting as well as the behavior exhibited in the classroom, I discerned the ways in which art engages students more than other strategies of prewriting.

Validity and Reliability

This section discusses the validity and reliability of this research. This study was designed to answer the following question: *How does original artwork as a prewriting strategy impact the completion and quality of high school students' writing?* along with the secondary questions: *How does art as prewriting affect students' fluency in writing?* and *In what ways does art engage students more than other forms of prewriting?*

This research established reliability since it used multiple sources of data, which cross-checked results from several data sources to find any similar or contrasting patterns before findings were finalized. A comparison of written commentary and numeral scoring yielded similar results, justifying triangulated reliability. A clear coding system was developed to add another layer of comprehension of student-created artwork and writing. Standardized procedures were implemented when entering, evaluating, calculating, and graphing data. When assessing student work, the same rubric was used to examine the effect of artwork as prewriting in multiple tasks within varying writing genres.

The data collected for this study was valid because the assignments gathered for evaluation were designed specifically to measure the quality of writing output with their artistic prewriting, granting internal validity. Second, multiple sources of data were collected and multiple systematic methods of analysis implemented. In collecting two sets of data, the research intended to explore the usefulness of the intervention in more than one setting. Data was analyzed using the same rubric style and similar teacher comments categories, and results were

evaluated quantitatively. Furthermore, thick description solidified the context for the interpretations and observations. Moreover, as stated in Chapter 1, this data was collected from students I taught in the 2024-2025 school year. Thus, not only had I acknowledged the established relationship, but this experience also qualified me to evaluate the growth of this set of students' writing and learning skills since there had been prolonged engagement amongst and persistent interaction between the parties.

Limitations

This section explains the research designed to investigate the primary and sub-questions identified in this study. The main research question is: *How does original artwork as a prewriting strategy impact the completion and quality of high school students' writing?* The sub-questions questions are: *How does art as prewriting affect students' fluency in writing?* and *In what ways does art engage students more than other forms of prewriting?*

One significant limitation of this study was time. The data for the study was collected between May and June 2025. Although there was a month and a half between the first assignment and the second, most of the instruction time did not focus on the art as prewriting method as the researcher-teacher had other curricular duties to fulfill. More time and practice with the technique may have led to greater student gains. Furthermore, the second data collection was taken from the students' English final exam, creating various limitations. Students did not have adequate class time to work on the prewriting. Although there was a partial period available, most students used it to complete the study guide, not the prewriting. Students were responsible for bringing the prewriting with them to school on the day of the exam, yet some forgot and had to work from memory. Despite studies that tout drawing's effect on memory

(Andrade, 2010; de Leur et al., 2020; Hellenbrand et al., 2019; Meade et al., 2019; Roberts & Wammes, 2021; Traue & Stewart, 2022), students still had to utilize significant executive resources to access those ideas within an already stressful environment. Adding to this strain, nearly all students wrote the essay after taking the multiple choice and short response portions of the exam. Even though they were informed verbally and in writing that they could freely move about the exam, many chose to wait, and thus ran out of time. Moreover, due to the final exam schedule, one class received a week to prepare the prewriting, whereas the other had four days. Additionally, by the time the students took their final exam, they had already been notified if they had passed the course for the year; those whose final exam grade would not mitigate their failing grade did not put in as much as effort as those who knew the exam mattered.

Other notable limitations to this study concern the nature of the assignments, class size, and student behaviors. To begin, Assignment #1 was a descriptive writing piece; Assignment #2 was argumentative. Although the study implemented the same measures for both writing pieces, students may have found the expectations of one genre more demanding than the other. Because Assignment #1 was written at home, students took longer to compose it; revision histories indicated multiple writing sessions. The final exam was given in one two-hour block. This may account for varying measures of fluency. Due class sizes, only the work of 35 students was available for analysis. Additional student samples would provide further concrete evidence of the intervention's effectiveness. Finally, seven students did not follow directions for Assignment #1. Even though they completed it, two handwrote the composition, one plagiarized, and four students did not write in Google Docs (limiting the available data for analysis). Regarding Assignment #2, one student forgot his iPad on the day of the exam and had to handwrite the essay, and another chose not to write anything. Collectively, these actions impacted data

collection and findings of this study. Finally, it is important to account for the subjectivity in writing assessment. Another grader could use the same rubrics and coding system but could return original data.

CHAPTER IV: Findings

Findings

This chapter will present the findings from the document analysis described in Chapter 3. Data was gathered from the prewriting and final drafts of two writing assignments. A constant comparative method was used for analysis, and evidence was categorized as related to the research questions: *How does original artwork as a prewriting strategy impact the quality and completion of high school students' writing? How does art as prewriting affect students' fluency in writing?* and *In what ways does art engage students more than other forms of prewriting?* Once sorted, data was coded, triangulated, and measured statistically. Charts and graphs were designed to clarify data and track trends. Four themes emerged from the analysis of original artwork as a prewriting strategy: impact on the quality of writing, impact on writing completion, impact on writing fluency, and impact on student engagement and creativity.

Impact on Writing Quality

Students' writing accompanied by an artwork prewriting assignment was assessed twice over the course of a month and a half. When Assignment #1 was introduced to students, they had just completed reading Chapter Six in William Golding's novel, *The Lord of the Flies.* In this chapter, a main character, Jack, creates a mask out of wilderness materials, to shield his subconscious from the atrocities he will commit in the name of leadership. Our class discussion focused heavily on the symbolism of the mask and its effect on characterization. Students received Assignment #1 the next class period. I reviewed directions and the rubric with them and showed them sample masks I found on another teacher's website. Students had some questions about the writing prompts, which were promptly addressed. As instructed in the assignment,

once they completed the mask, students were to produce three distinct paragraphs: the first had to include an explanation of the chosen symbols, their meaning, and why they were chosen; the second should have discussed which traits of the wearer the mask will accentuate and which it will hide; and the final paragraph asked students to consider the colors chosen for the mask and conduct a psychological color analysis in relation to the psyche of its wearer.

I assessed students' writing with a rubric (Appendix A) that was tailored to the assignment. Students received a copy of same rubric when the assignment was given. Students could earn eight points in the writing-related rubric categories. Table 1 presents statistical measures for these scores. Notably, the score earned most by students was a 7/8. This means that students either received full or nearly full credit in the paragraph content criterion and the mechanics criterion. Thus, they successfully composed the three quality paragraphs.

Table 1

Assignment #1: Writing Scores Statistical Measures

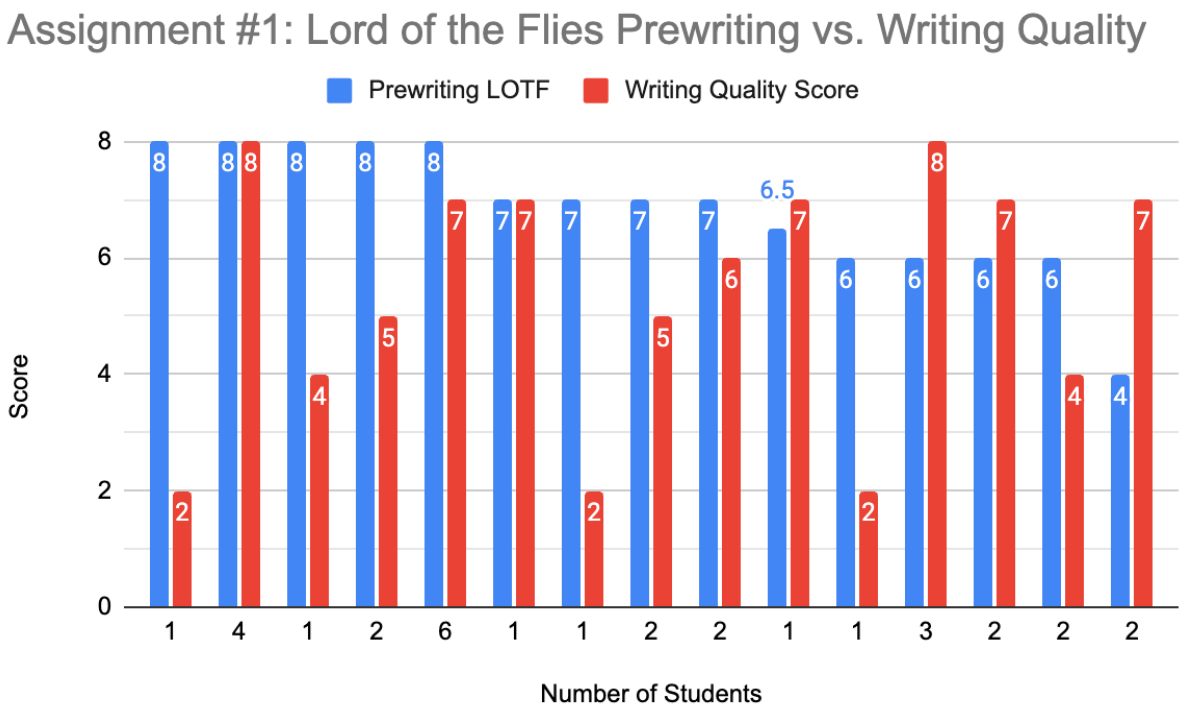
Scores on Writing Assignment	Correlation: Writing Score to Prewriting Score
Mean: 6	r=0.699018591
Median: 6	(high positive)
Mode: 7	

The standard deviation (SD) for the writing score was 2.56, indicating some variability in scores. Regardless, Figure 1 compares the prewriting rubric score (a combination of focus and neatness) to the writing quality rubric score, revealing that nineteen students who earned a 6 or higher on their prewriting also received a high grade on their writing. Yet, there are ten documents in which a satisfactory prewriting produced an insufficient writing score, and two

instances where a high writing score was attained despite a minimal prewriting effort. Even with these outliers, a correlation coefficient between the writing score and the prewriting score yielded a high positive (r=0.699018591), establishing a general trend.

Figure 1

Assignment 1: Comparison of Prewriting Rubric Score to Writing Quality Rubric Score



Students' writing for Assignment #2 was assessed with a similar rubric to the one implemented in Assignment #1. Again, the rubric was tailored to the assignment, so even though the rubric housed the same criteria, the expectations varied. Students received a copy of the rubric when the assignment was given as a part of their Final Exam Study Guide. On the exam, students could earn 30 points for the exam, but the scores have been recalculated for comparison's sake to match the eight-point scale of Assignment #1. Table 2 presents statistical measures for these scores. Of note in this set of scores is the mode, which is comprised of three

separate scores: 6.4, 6.46, and 8. All three scores are above an 80% and are close in range to one another (SD = 1.43).

Table 2

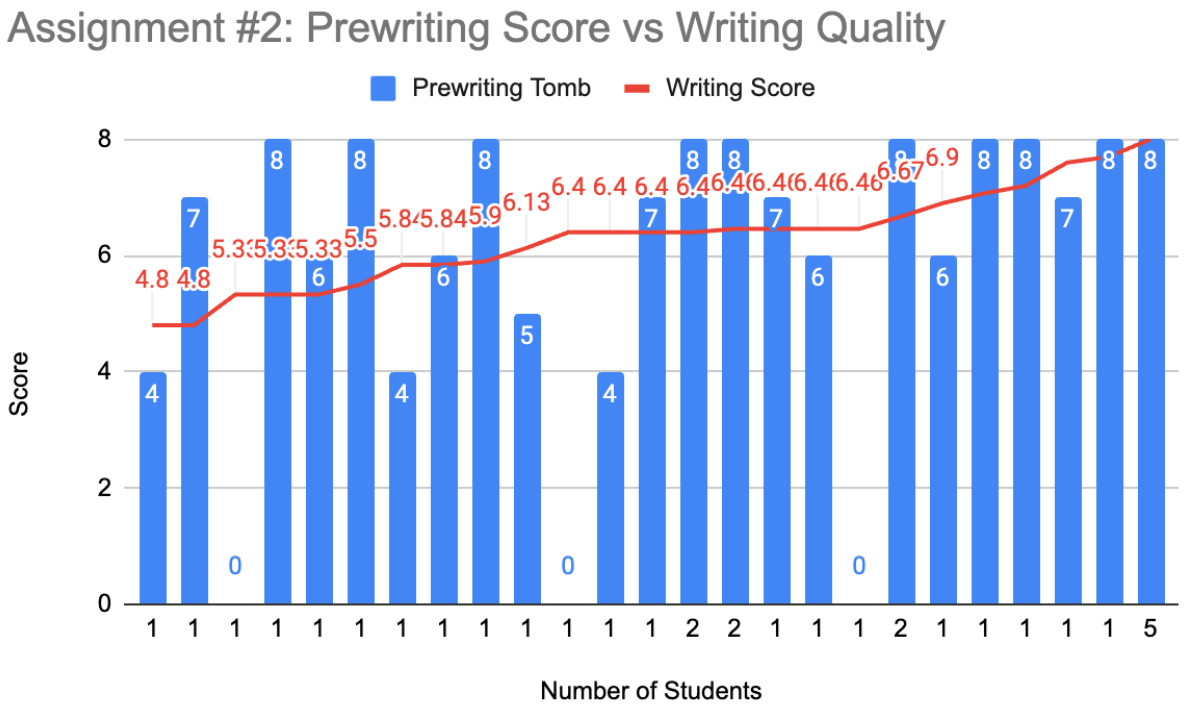
Assignment #2: Writing Scores Statistical Measures

Scores on Writing Assignment	Correlation: Writing Score to Prewriting Score
Mean: 6.34	r=0.364250971
Median: 6.4	(moderate positive)
Mode: 6.4, 6.46, 8	

Figure 2 compares the prewriting rubric score to the writing quality rubric score. Despite a smaller standard deviation, 54% of students received an equal or higher grade on their writing when compared to their prewriting score, producing only a moderately positive correlation coefficient (r=0.364250971). As shown in the graph, there were three students who received a zero on their prewriting, but two of them still earned at least an 80% on their essay. Contrarily, six students who achieved lower scores on the prewriting also produced lower quality writing. Thus, it appears the quality of the prewriting did not significantly impact the overall writing performance of Assignment #2.

Figure 2

Assignment 2: Comparison of Prewriting Rubric Score to Writing Quality Rubric Score



Impact on Writing Completion

The pie chart (Figure 3) presents the number of students whose work was analyzed for this study. Out of those 35 students, 28 turned in fully completed assignments for Assignment #1. Fully completed assignments consisted of a prewriting artwork and a writing submission; content and quality did not factor into this categorization. Three students submitted partially completed work: two completed the prewriting art activity but did not compose the paragraphs, and one created the artwork, but plagiarized a majority of the written section. Four students did not submit any work. For this group of students, an 80% fully completed assignment turn-in rate was progress.

Figure 3

Assignment #1: Comparison of Fully Completed Assignments and Partially Completed Assignments

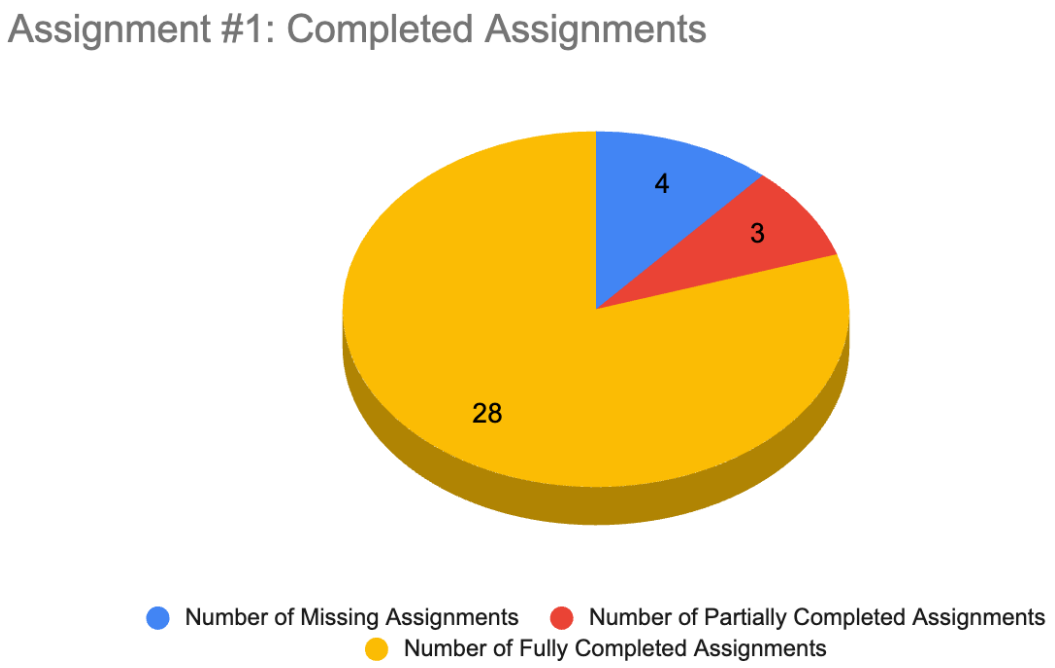


Figure 4 displays the late work data for Assignment #1. Nearly 77.5% of the students turned in their work on-time. In other words, students submitted their writing on or before the due date via Google Classroom, and they turned in the artwork at the beginning of class. A majority of students with late work had not written the paragraphs, even if they came to class with completed prewriting.

Figure 4

Assignment #1: Comparison of Late Assignments to On-Time Assignments

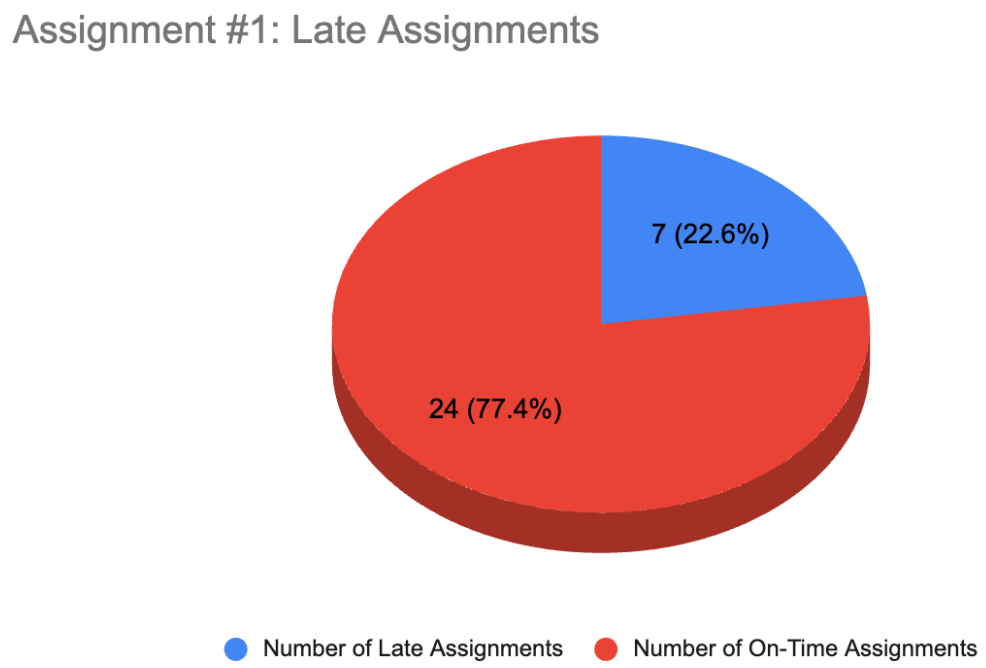
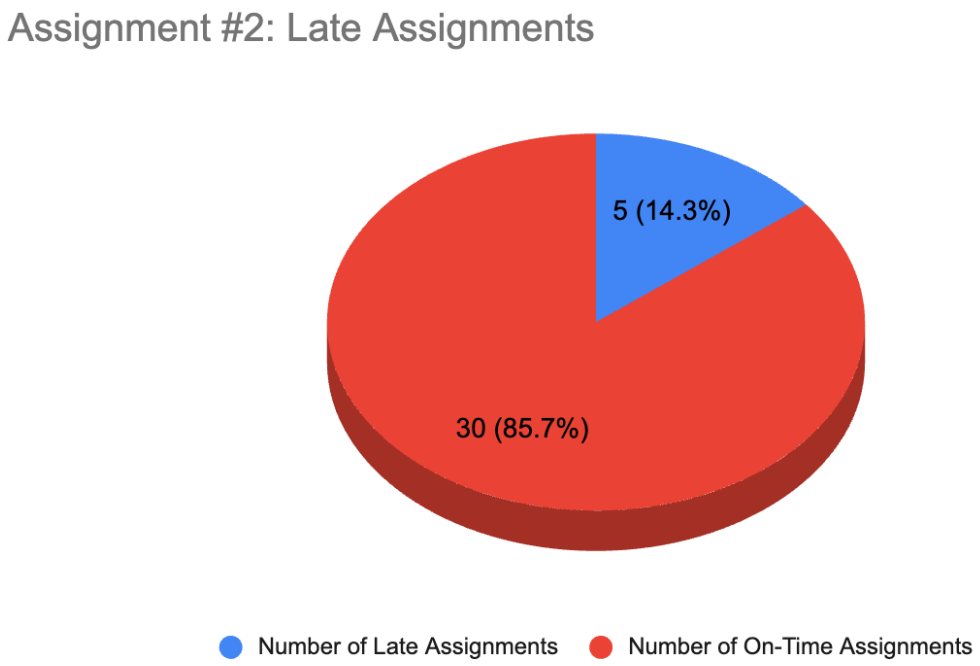


Figure 5 displays the late work data for Assignment #2. Nearly 86% of the students turned in their work on-time. This is to say that students entered the classroom on exam day with their completed prewriting. Five students forgot their prewriting at home. I advised each one to imagine it the best they could as they wrote their essay. For each class, I emailed those students' guardians to inform them that the prewriting was not submitted and told them that students had until the next day to turn it in for credit on the exam. I received the remaining seven prewriting papers the day following each email, respectively. Because the essay was written in class as a part of the final exam, no writing submissions could be deemed late.

Figure 5

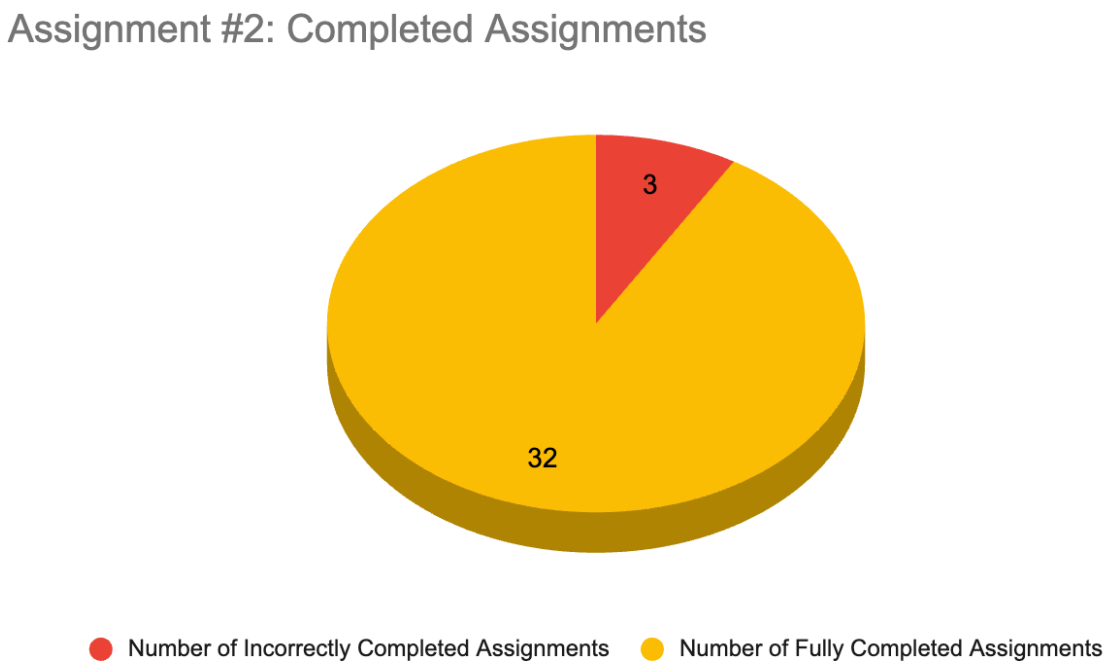
Assignment #2: Comparison of Late Assignments to On-Time Assignments



The gathered artwork for Assignment 2 yielded curious data: three students incorrectly completed the prewriting assignment (Figure 6), and all three made the same error. The instructions permitted to include lines of text from *Romeo and Juliet* of up to six words as well as single words to remind them of names and themes as part of their artwork. The three students did not include any drawing. Instead, they wrote out sentences as if they were composing a traditional outline or completing a regular written graphic organizer. Because this was not the assignment, these students did not receive credit for their work, nor could they use the prewriting on the exam as stipulated in the instructions.

Figure 6

Assignment #2: Comparison of Correctly Completed Assignments to Incorrectly Completed Assignments



Impact on Fluency in Writing

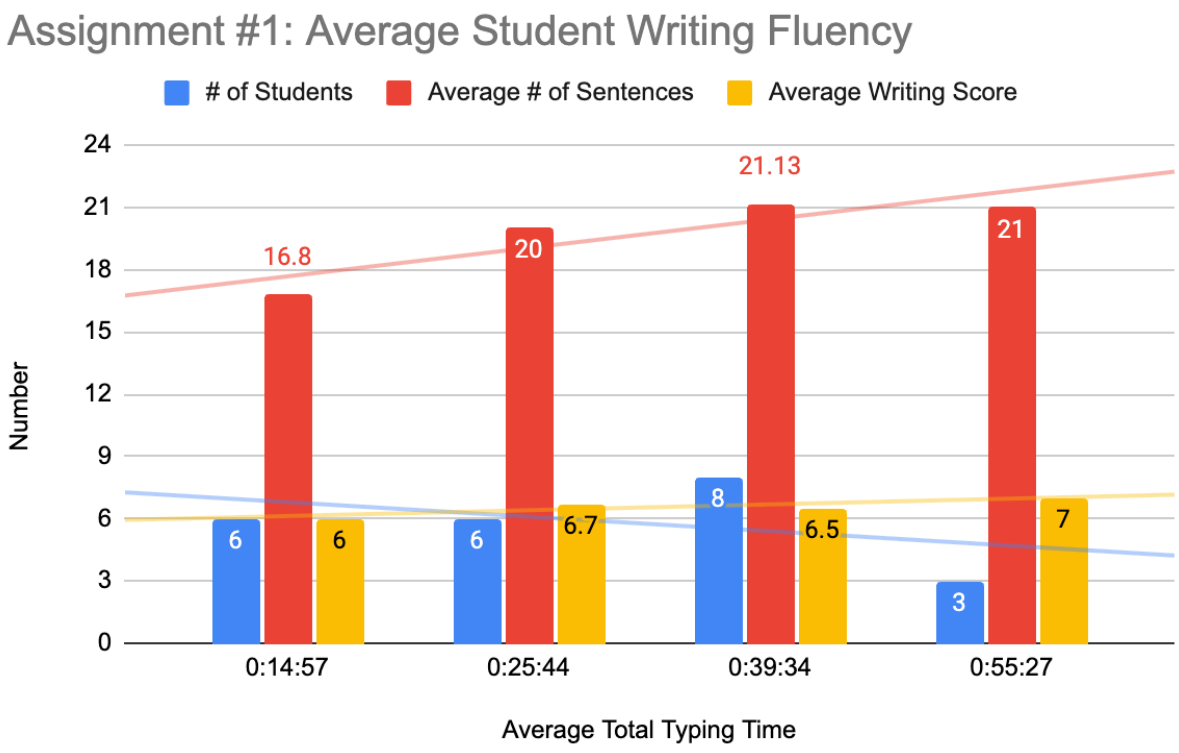
There are various methods educators use to calculate fluency. The traditional technique counts the number of words, characters, or sentences in a written piece and divides that number by total time it took to compose the writing. This number is typically compared to the quality of the work. Thus, fluency is measured in terms of the final product. Only 23 of the 35 students composed their writing for Assignment #1 on a platform from which typing time could be acquired. The following data reflects those 23 students.

Figure 7 showcases the average student writing fluency in a graphic format. Because student typing times were so varied, they were categorized into four frames: between 8:10 (the quickest time) and 20 minutes, from 20 minutes to 30 minutes, between 30 and 45 minutes, and

from 45 minutes to an hour. Accompanying each time entry was the sentence count and writing score. All three criteria were separately averaged. Six students in the average typing time group of 14:57 scored a mean of 6, or 75% on the writing portion and composed an average of 16.8 sentences. In the second group, six students who wrote a mean of 20 sentences took an average of 25:44 and earned a score of 6.7, or 83.75%. Eight students who averaged a typing time of 39:34 received a mean score of 6.5, or 81.25%, with 21.13 sentences. Finally, three students wrote for an average time of 55:27 to compose 21 sentences for an average score of 7, or 87.5%. This data indicates that the most fluent writers are not the quickest nor the highest scoring, but rather somewhere in between. According to Figure 7, Group 2 appears to be the most fluent.

Figure 7

Assignment #1: Average Student Writing Fluency (Traditionally Calculated)



In total, students averaged about half an hour to compose Assignment #1 (Table 3). There were three modes for the number of sentences written in each piece: 16, 25, and 27. However, the median sentence count was 19.7. Calculated traditionally, students' fluency is .63 sentences per minute (SPM).

Table 3

Assignment #1: Traditionally Calculated Fluency Statistical Measures

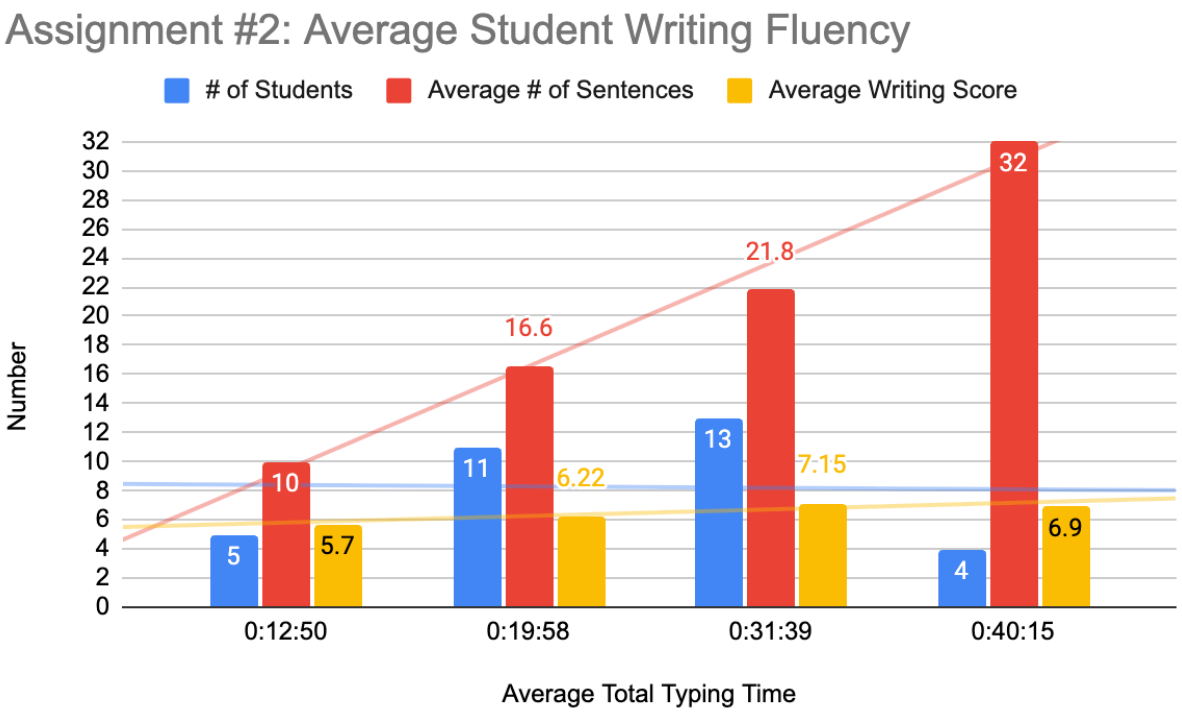
Number of Sentences Written	Amount of Time Used for Writing
Mean: 19.7	Mean: 31:36
Median: 18	Median: 29:29
Mode: 16, 25, 27	Mode: No mode

The same approach was taken to categorize the fluency data for Assignment #2. Thirty-three of the 35 students composed their writing for Assignment #2 on a platform from which typing time could be acquired. Figure 8 reflects the data for those 33 students' average writing fluency for the argumentative writing piece in a graphic format. Again, times were categorized into four frames: between 9:50 (the quickest time) and 15 minutes, from 15 minutes to 25 minutes, between 25 and 35 minutes, and from 35 minutes to 50 minutes. Accompanying each time entry was a sentence count and writing score. All three criteria were separately averaged. Five students in the average typing time group of 12:50 scored a mean of 5.7, or 71.25% on the writing portion and composed an average of 10 sentences. In the second group, eleven students, who wrote a mean of 16 sentences took an average of 19:58, earned a score of 6.22, or 77.75%. Thirteen students who averaged a typing time of 31:39 received a mean score of 7.15, or 89.38%, with 21.8 sentences. Finally, four students wrote for an average time of 40:15 to compose 32

sentences for an average score of 6.9, or 86.25%. Here, data hints that the most fluent writers may be the ones in group 3 that not only scored the highest but averaged closest to the assignment's sentence statistical measures.

Figure 8

Assignment #2: Average Student Writing Fluency (Traditionally Calculated)



In total, students took almost 26 minutes to compose Assignment #2 (Table 4). The median and mean sentence count were 19 and 19.85, respectively. Calculated traditionally, students' fluency is .78 sentences per minute (SPM), which is slightly higher than Assignment #1.

Table 4

Assignment #2: Traditionally Calculated Fluency Statistical Measures

Number of Sentences Written	Amount of Time Used for Writing
Mean: 19.85	Mean: 25:57
Median: 19	Median: 28:07
Mode: 19	Mode: 14:18

Another method educators implement to calculate fluency is to analyze the process data from students' written assignments. Process data consists of both summative measures like total word and character count as well as a calculation of the characters typed per minute plus a log of the number of total changes made to a document, the number of changes made every five-six seconds (in this study), the number and length of significant pauses a student took while typing, and the duration and count of P-bursts (over 5 seconds in length for this study).

Table 5 showcases various writing fluency data averages for Assignment #1. Because students were instructed to type both writing assignments, the character count, in addition to the word count, becomes instrumental when evaluating fluency. Students averaged 402.42 words across the three paragraphs in Assignment #1 while using a mean of 2260.63 characters. Furthermore, they averaged 78.54 characters per minute. The second column in Table 5 displays data for these categories in relation to Assignment #2. Students wrote an average of 396.74 words and used 2303.47 characters in their final exam essay. Their writing had a mean of 89.56 characters per minute.

Table 5

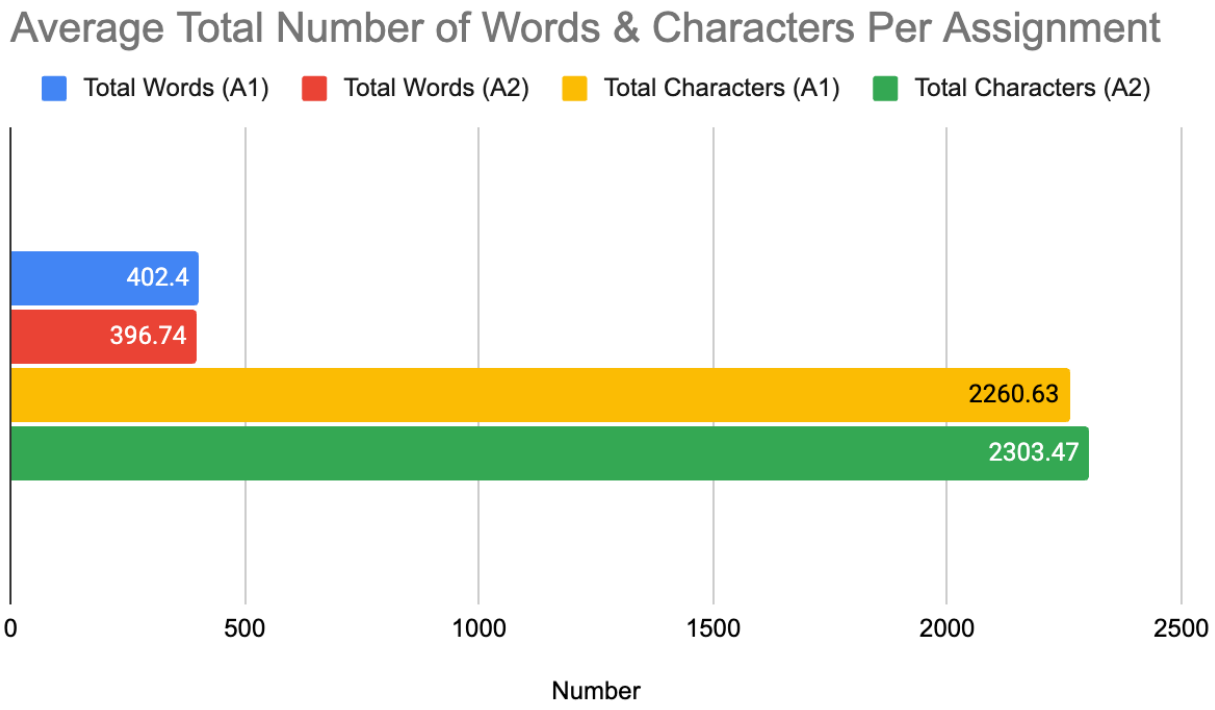
Process Data

Averages: Assignment #1	Averages: Assignment #2
Characters Per Min: 78.54166667	Characters Per Min: 89.56
Total Words: 402.4166667	Total Words: 396.74
Total Characters: 2260.625	Total Characters: 2303.47
Total Changes: 2204.5	Total Changes: 2184.76
Process Data (changes made every 5+ seconds): 192.4583333	Process Data (changes made every 5+ seconds): 193.24
Number of Pauses: 8.916666667	Number of Pauses: 1.97
Pause Average: 0:05:44	Pause Average: 0:00:53
Number of P-Burst (longer than 5 seconds): 11	Number of P-Burst (longer than 5 seconds): 3.03
Burst Average Duration: 0:03:42	Burst Average Duration: 0:11:02
Characters Per Burst: 269.54	Characters Per Burst: 818.60

When comparing these fluency categories, students produced more characters per minute for Assignment #2, which was written in-class as part of the final exam. Figure 9 shows negligible difference in the word count between Assignment #1 and Assignment 2; however, students typed over 1,000 more total characters for Assignment #2. While further analysis is needed to discern the reason for difference in characters, it could be the result of a more sophisticated vocabulary or greater punctuation usage due to further English Language Arts instruction or maturity.

Figure 9

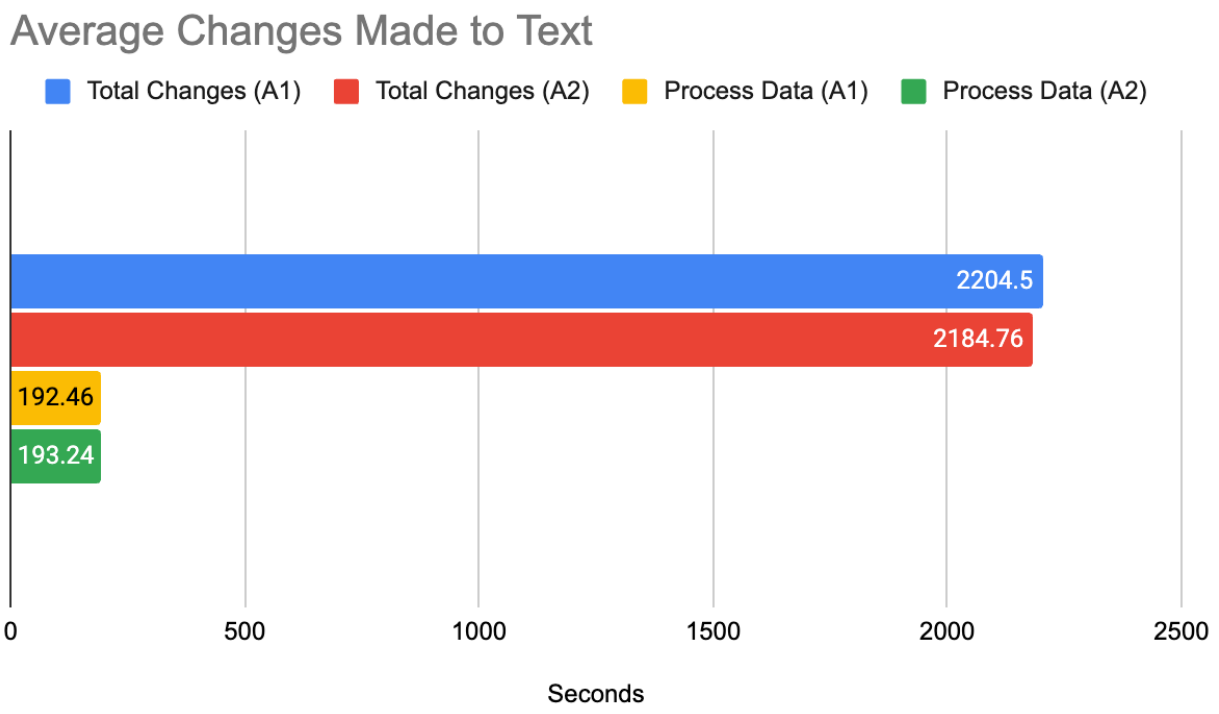
Comparison of Average Total Number of Words and Characters Per Assignment



The total number of changes to both writing pieces is comparable at roughly 2,200 changes per document (Figure 10). Similarly, the number of changes made every five plus seconds is approximately 190 changes per document. This data hints at a fixed mindset when composing written text as students appeared to have approached each composition in a similar manner.

Figure 10

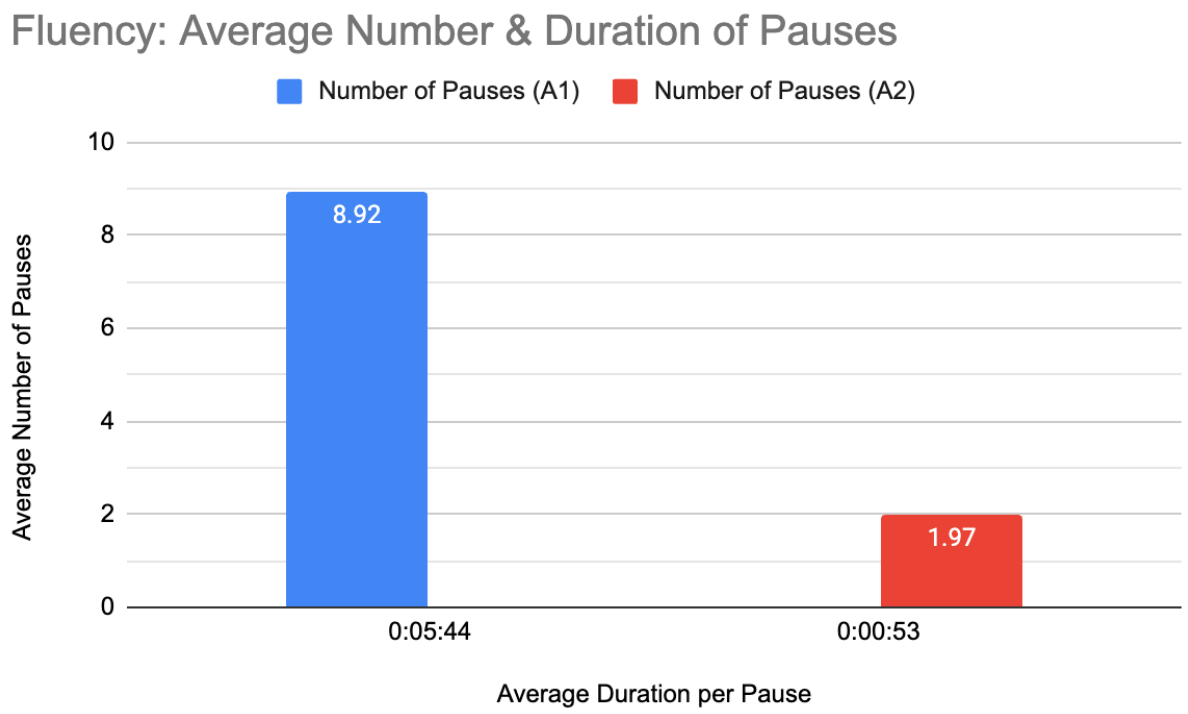
Comparison of Average Total Changes Made to Text & Process Data (Changes Made Every 5+ Seconds)



Another measure of fluency, the number and duration of pauses taken when writing, are indicative of students' cognitive processes. Assignment #1 averaged 8.92 pauses for a mean length of 5:44 (Figure 11). Conversely, Assignment #2 yielded fewer pauses (mean: 1.97) for a duration of 53 seconds. This indicates that students' writing was more fluid in the composition of Assignment #2.

Figure 11

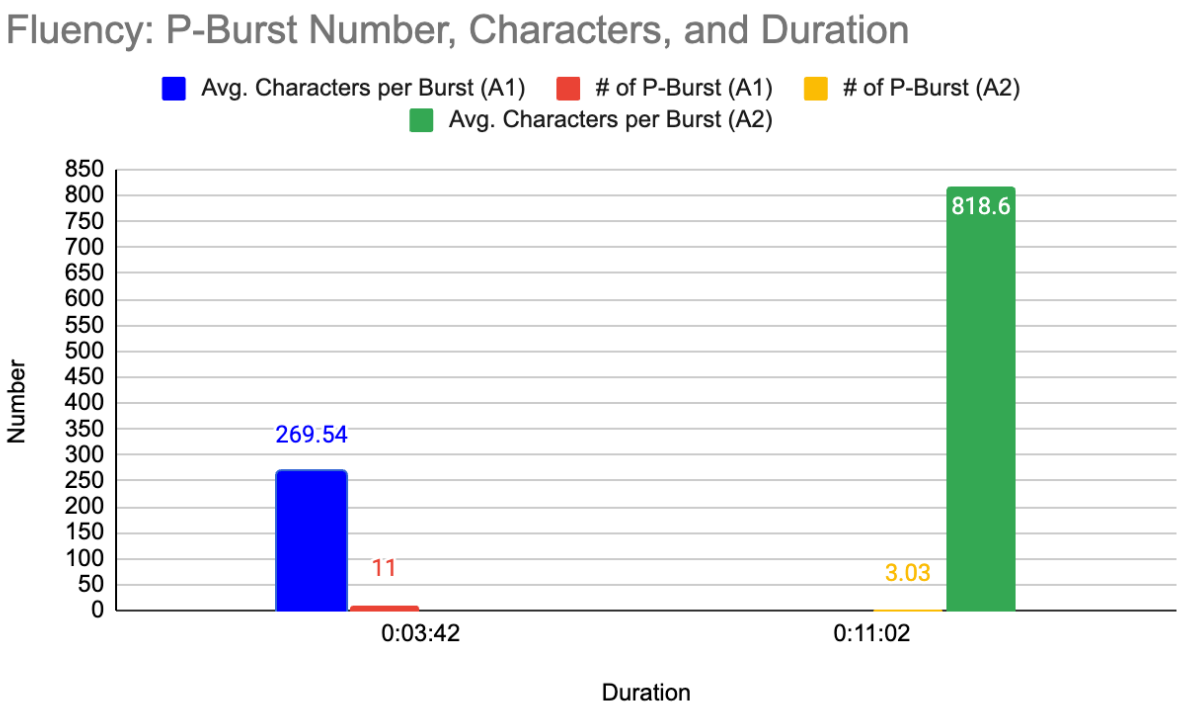
Comparison of Average the Number of Pauses and Pause Duration During Assignment #1 (A1) and Assignment #2 (A2)



Within the active typing time, students accumulated an average of 11 writing bursts during Assignment #1 in which they produced a mean of 269.54 characters (Figure 12). Each burst lasted on average for 3:42. Meanwhile, Assignment #2 had fewer (3.03) but lengthier (11:02) bursts. During these more productive writing bursts, students wrote a mean of 818.6 characters.

Figure 12

Comparison of Average the Number of P-bursts by Number, Character, and Duration for Assignment #1 (A1) and Assignment #2 (A2)

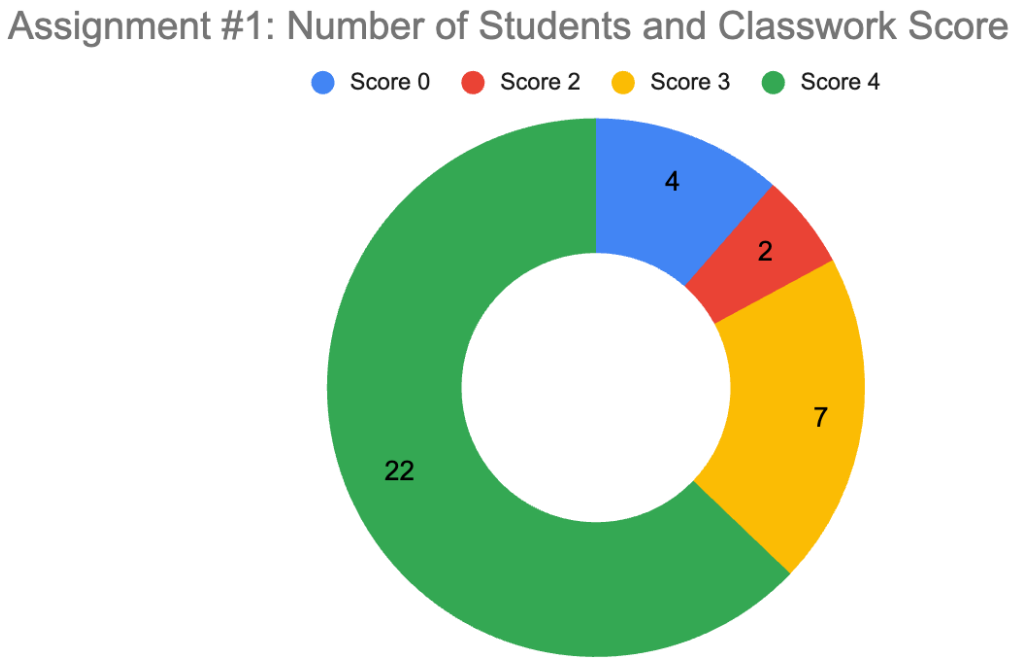


Impact on Student Engagement and Creativity

Students had the opportunity to work on Assignment #1 for one class period. Throughout that time, I observed students' behavior and marked them as on-task and engaged with the assignment or off-task. To receive full credit, students had to focus on the project, use class time to their advantage, and not distract others; twenty-two students earned a rubric score of 4 (Figure 13). Seven students received a rubric score of 3, which indicates that they used most of their time wisely. Two students scored a 2, meaning they spent much of the period distracting others or off-task. Four students were marked as zero for a classwork score because they chose to not engage with the task. Three of these four students did not turn in the assignment.

Figure 13

Assignment #1: Comparison of Number of Students to Classwork Rubric Score



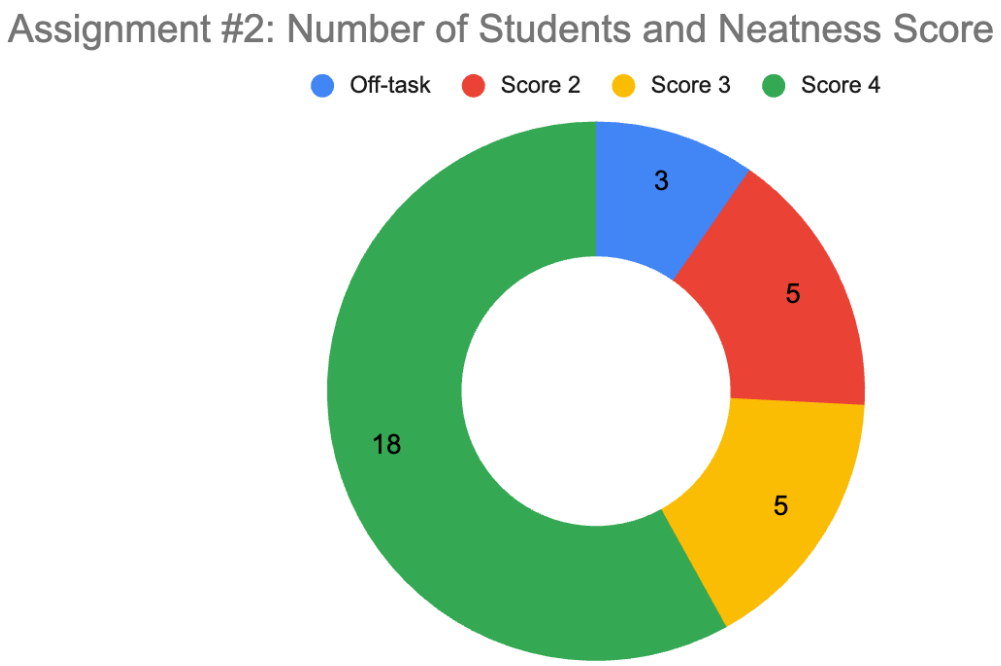
A measure of student engagement is neatness and pride in work. Neatness demonstrates a level of effort and time; the work was clearly not rushed. If students care about the work they produce, they will put in extra effort to ensure its quality. Thus, the prewriting masks (Assignment #1) received a neatness score on the rubric. All students who turned in their prewriting mask received either a three or a four in this category. To be awarded these points, work had to be attractive in terms of design, layout, and neatness. The chosen designs and symbols needed to have a purpose. The visual layout should have figured into the wearer's representation of themselves. Students clearly took pride in the final result - even those who did not write the paragraphs brought their prewriting art to show others. This project sparked written critical thinking and discussion.

The prewriting tombstones were also subjected to a neatness score on the rubric (Figure

14). For Assignment #2, 23 students earned a three or four on the rubric. Five students received the score of 2, which means the work was rushed or messy. Meanwhile, as previously reported, three students incorrectly completed the assignment and received a zero according to the rubric. The tombstones were not officially shared with others as they were part of an exam.

Figure 14

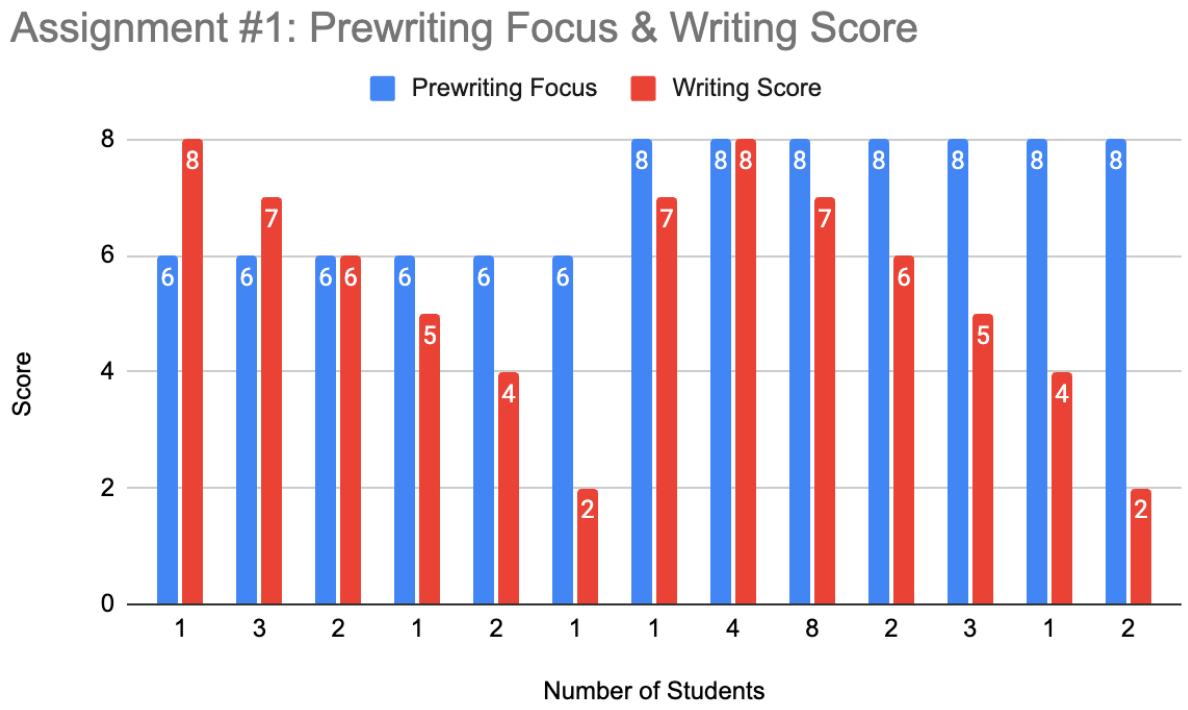
Assignment #2: Comparison of Number of Students to Neatness Rubric Score



The artwork for both assignments was also subjected to a focus rubric score. This category ensured students followed directions and included all requirements, so it used language lifted directly from the respective assignments. Figure 15 displays a comparison between the prewriting focus score and the writing quality score for Assignment #1. Twenty-one students who earned a high mark on their artistic prewriting also earned above a 75% on their writing, suggesting that a mask that fulfilled the focus criterion aided students in recalling the necessary information.

Figure 15

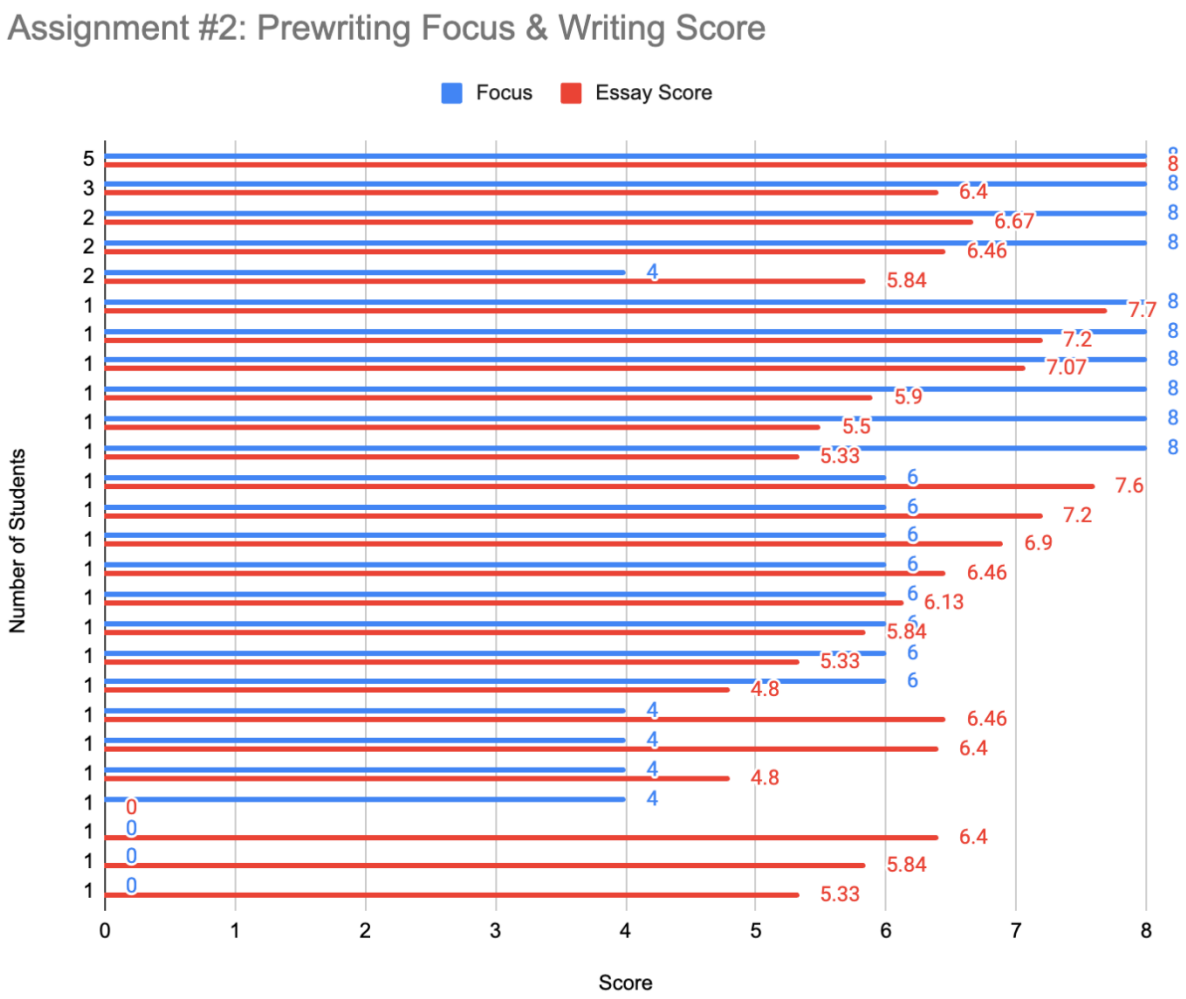
Assignment #1: Comparison of Prewriting Focus Rubric Score to Writing Score



The data for Assignment #2 is not as direct (Figure 16). Six students who received full credit on the prewriting scored under 75% on the writing. Two students who earned half credit on the prewriting scored an 80% or higher on the writing as did one student who incorrectly completed the prewriting assignment. However, 20 students did receive high scores on both the prewriting and the writing, reflecting that the strategy was useful for 57% of students.

Figure 16

Assignment #2: Comparison of Prewriting Focus Rubric Score to Writing Score



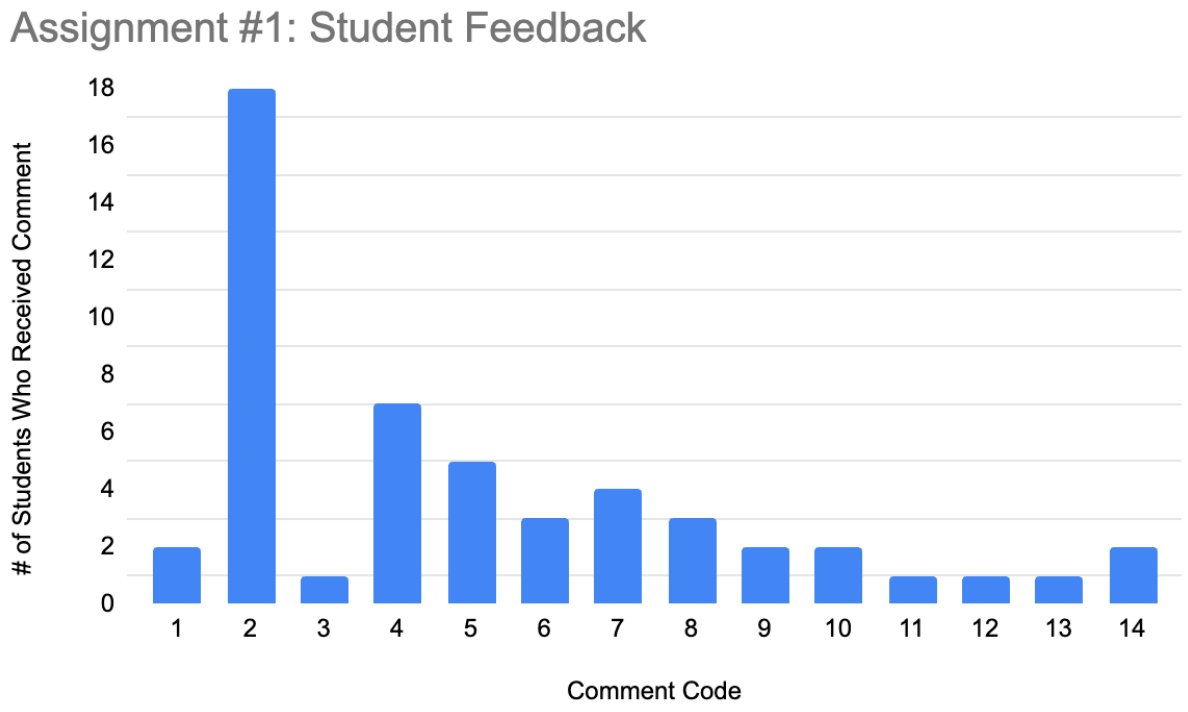
Creativity is a third factor in measuring student engagement. In the document analysis of the artwork, I discovered many of the teacher comments regarded the artistic nature of the prewriting. In fact, as shown in Figure 17, Artwork Compliments (Comment 2) were the most noted feedback for Assignment #1. For example, on one mask I commented, "I like how the Band-Aids cross the line of division on the mask. That is clever." This student's creative decision demonstrates his understanding of his chosen character, and this choice provided him

with symbolism to ponder in his written analysis. Another student received the feedback, “Love the connection you make to nature! The crack is a great addition. The colors in the eyes are haunting!” This student colored her mask green and decorated it with leaves and flies. Additionally, she drew a lightning bolt-style crack in the upper-right corner of the mask, framing one eye whose pupil is also generating similar cracks. The colors are fading from a reddish orange to a yellow to blue to pink to black. These details provided this student with multiple opportunities to discuss symbolism, persona, and color in her written piece (Appendix B).

The compliment comment category was followed by Comment 4, or “Feedback about symbols”, which was provided to seven students. These comments could have been complimentary or critical and referred to the artwork or the writing, but they mentioned details in relation to a requirement of the project. The third most received comment was Comment 5 (Explain how the mask changes the wear’s persona). This was the focus of paragraph two, which some students missed entirely or on which they did not expand.

Figure 17

Assignment #1: Most Common Feedback Provided to Students



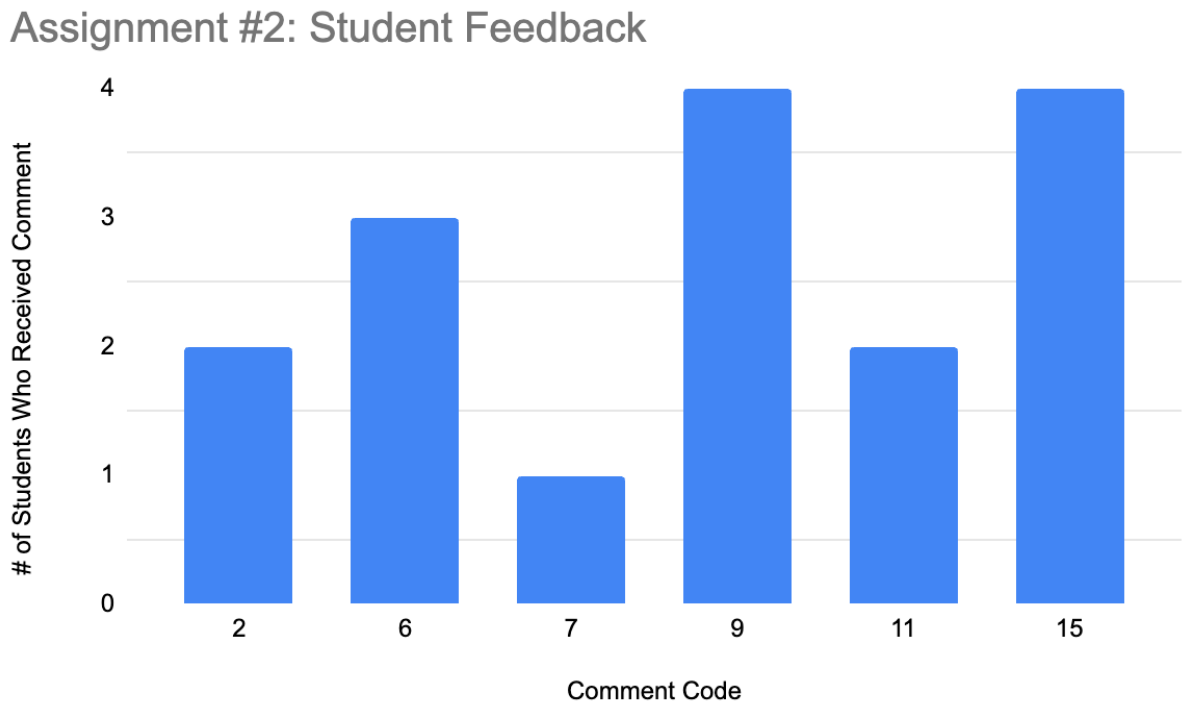
Abbreviated Code Key		
1 – No writing included – only prewriting turned in	6 – Add one or more paragraphs	11 – Proofread needed
2 – Artwork compliment given	7 – Writing compliment given	12 - Late
3 – Paragraph development needed	8 – Assignment not turned in	13 – Plagiarism detected
4 – Feedback about symbols	9 – More analysis required	14 – Clarify theme
5 – Explain how the mask changes the wear's persona	10 – Element not featured on the prewriting mask	15 – Include less summary

Because Assignment #2 was a part of the final exam, I had limited time to grade it, so my comments were sparse and direct in nature to justify the students' scores (Figure 18). Comments 9 (More analysis required) and 15 (Include less summary) were written the most. Nonetheless, students turned in masterful pieces of art (See Appendix C). For instance, some sketched entire

scenes from *Romeo and Juliet*, while others took a more symbolic approach and drew objects like a rose, poison, and swords. Some students divided the tombstone in half to mimic the mask project, proving the impact of that particular project. Overall, though, it is the students' interpretation of their prewriting and their commitment to its written explanation that is the best measure of their engagement with the assignment as a whole.

Figure 18

Assignment #2: Most Common Feedback Provided to Students



Summary

The findings stated in this chapter present evidence from which conclusions can be drawn regarding the effectiveness of using artwork as a prewriting technique. According to the data, original artwork has a generally positive effect on students' writing performance as students averaged 75% and 79%, respectively, on the assignments. Artwork as prewriting appears to

promote work completion and reduces the number of late and missing assignments. Only four of the 35 students in the study did not turn in Assignment #1; all of the students completed at least the drawing portion of Assignment #2. Based solely on the data, students seem more writing fluent in Assignment #2; their SPM improved as did the duration of their P-bursts. Additionally, they composed more sentences in less time, and 86% of students improved their writing score, had it stay the same, or saw it drop less than 10 percentage points. Finally, based on observation and analysis of the artwork, students find this method engaging and creative. They worked diligently during class time, and many included creative details in their drawings that spawned critical analysis within their writing. Assignment #2's prewriting truly tested this method since students had more say in its design to suit their recall in a timed situation. Those who mimicked Assignment #1 in style performed better because they had artistic elements to discuss like symbolism and color rather than revert to summary. Overall, original artwork, while not an astounding success for all students, was rewarding enough to be included as part of a teacher's prewriting methodology.

Chapter V

Conclusions, Discussions and Recommendations

This chapter discusses the conclusions drawn from the findings presented in the previous chapter and further develops interpretations of said data to highlight the benefit of the creativity in the English classroom. The discussion responds to the main research question: *How does original artwork as a prewriting strategy impact the quality and completion of high school students' writing?* and the secondary research questions: *How does art as prewriting affect students' fluency in writing?* and *In what ways does art engage students more than other forms of prewriting?* Based on the document analysis of Assignment #1 and Assignment #2, the following conclusions have been determined: (1) the use of original artwork as a high school prewriting strategy promotes work completion and reduces the number of late assignments, but its effectiveness on the quality of students' writing is dependent upon students' willingness to engage with the method; (2) aided by the implementation of artwork as a prewriting strategy, students' writing fluency rose; however, it is evident that the change in writing environment impacted fluency measures; and (3) students' positive affective behavior, including pride, acceptance, and creativity, spurred by an artistic assignment, led to greater quality in their writing.

Conclusion I

The use of original artwork as a high school prewriting strategy promotes work completion and reduces the number of late assignments, but its effectiveness on the quality of students' writing is dependent upon students' willingness to engage with the method.

Discussion

Based on the data analysis related to first research question (*How does original artwork as a prewriting strategy impact the quality and completion of high school students' writing?),* students who struggle to turn in completed, especially writing-focused, work on time will welcome the opportunity to display their knowledge through other outlets. This group of students typically submitted work late, and about a quarter of the group was notorious for not turning in work at all. Eighty percent of students turned in fully completed mask projects (Assignment #1); of those 31 students, 77.4% submitted the mask and its accompanying writing on time. For Assignment #2, the number of late assignments dropped significantly, yielding an 85.7% on time turn in rate. Yet, the quality of students' writing when based on art can vary. Assignment #1 saw a high positive correlation between the quality of students' prewriting and their writing score, while Assignment #2 only found a medium positive correlation. However, the mean writing score for Assignment #2 was over four points higher than Assignment #1. Thus, the conclusion drawn is that students who embrace the original artwork method, create it as a prewriting document with the necessary requirements, and refer to it when composing will benefit from its value.

A main purpose of prewriting in any form is to allow for retention and limit strain on the short-term working memory. In this research, a version of The Drawing Effect, discovered by Meade, Wammes, and Fernandes (2019), was studied as a function of prewriting. Although Meade et al.'s (2019) study focused on the recall of concrete nouns, the concept is still viable in this context. Students drew masks and tombstones in preparation for explanatory and argumentative writing prompts. As students created their artistic prewriting, the images became encoded in their memories visually, semantically, and motorically. This transfer to long-term

memory aided in a clear transcription of content for some students, which ultimately improved the quality of their writing. In a similar research study, Roberts and Wammes (2021) tested The Drawing Effect on the recall of abstract nouns, which relates more to Assignment #2, in which students were instructed to draw images of themes as well as symbols. In Roberts and Wammes' research, they discovered that abstract terms are still encoded in the same ways as concrete nouns; in fact, artists create particular visual referents for the abstract idea, permitting them to recall it with more ease. However, in Assignment #2, the argumentative piece, students found this challenging and tended to write out the thematic words rather than draw them, which may offer a reason why their prewriting quality did not yield a higher correlation with their writing score.

Furthermore, like de Leur et al.'s (2020) research on whether drawing yields the same benefits as descriptive writing in a historical context and Traue and Stewart's (2022) study on transmediation, this study's conclusions are two-fold in that drawing and writing are dependent upon one another. I found similar results to de Leur et al. – writing sometimes contained more information than the drawings. Some students received the feedback "Not featured," indicating that details in their writing were not present in their drawing. This may be the result of the recursive nature of the writing process – brainstorming does not only occur before writing, but during composition too. Other students' drawings seemed incomplete until I read their written pieces, which elaborated on details and choices I had not considered. Since art is more symbolic in nature than explanatory or argumentative writing, it is understandable that the purpose or meaning behind every decision is not obvious. In relation to Traue and Stewart's study, students were able to translate an artistic language to a written composition through the skill of "zooming in." Akin to their findings, this study found that after the second implementation of art as

prewriting, students' mean number of sentences increased as did their quality of writing.

The present research operated under the theoretical frameworks of The Cognitive Process Model (Flower & Hayes, 1981) and the new Hayes Process Model (Hayes & Nash, 1996). When writing is taught as a process, it is broken into recursive pieces, but it usually begins with the Planning phase. Within this phase, writers brainstorm ideas, which may be abstract or visual in nature (Flower & Hayes, 1981), and then elaborate on and organize those ideas during prewriting. The original artwork as prewriting strategy combines brainstorming and prewriting into a single approach. As the artist elaborates on their drawing, they will automatically make inferences, organize ideas, and produce new concepts to be stored in the visuo-spatial sketchpad (Hayes & Nash, 1996). The working memory will both encode this information and then decode the necessary images and words to formulate meaning during text generation. The students who referred to their prewriting had lightened cognitive loads because there was less information to retrieve from their long-term memory; instead, in planning by abstraction (Hayes & Nash 1996), students studied the content goals, "represent[ed] the task" (p. 31), and produced more fully completed, on time, quality work.

Conclusion II

Aided by the implementation of artwork as a prewriting strategy, writing fluency rose; however, it is evident that the change in writing environment impacted fluency measures.

Discussion

The data gathered from Assignment #1 and Assignment #2 was analyzed using the product method of fluency (number of sentences/active writing time) and the process method of fluency (a version of keystroke data) calculations. Both measures yielded similar results: the quickest writers nor the highest scoring writers are typically the most fluent in relation to quality.

The fastest writers tend to skip requirements or do not revise their work. Some of the highest scoring writers take a longer time to compose, but their work is solid. From a product stance, the most fluent students were the ones whose sentence count was closest to the sample average: 19.7 (Assignment #1) and 19.85 (Assignment #2). Thus, it can be concluded that the group from Assignment #1 that wrote an average of 20 sentences in 25:44 and earned a score of 83.75%, and group from Assignment #2 that averaged a typing time of 31:39 with a mean score of 89.38% with 21.8 sentences were the most fluent. An examination of the process data reveals that Group 4 is the most fluent if much consideration is not given to quality. These students averaged 2.75 P-bursts, producing 1,068.81 characters in 15:19 per burst; however, the group quality average is 86.25%. Group 3, the most fluent as identified by the product data, averaged 3.62 P-bursts, writing an average of 846.47 characters in 11:43 per burst; their quality average score was 89.38%. Although not significant differences in process data, the extra duration of the P-bursts and the number of characters produced in relation to the 'B' average does indicate Group 4 was marginally more fluent. Additionally, when comparing fluency between Assignment #1 and #2, rises occurred in the following categories: characters per minute, total words, total characters, process data, burst duration average, and number of characters per burst. On a positive note, the number of pauses, as well as the pause length, dropped; accordingly, the number of P-bursts decreased significantly. The only data that did not rise is the number of changes made to the document as a whole, indicating that students did not have enough time to revise their writing within the exam block.

Meade et al. (2019) asserts that when an artistic task is semantically connected to vocabulary or ideas that need encoding, the working memory is more likely to recall that information with ease, which aids in writing fluency. In the present study, students drew distinct

symbols on their masks and tombstones because they had specific meaning; in sketching these drawings, students encoded the semantic meanings, so a glance at the image would trigger the recall of a theme. In Assignment #2, students were permitted to use more words than they were in Assignment #1. Consequently, there was less of a correlation between the quality of the writing and the quality of the prewriting. Meade et al.'s research proposes a possible likelihood for this occurrence: drawing outranks writing in memory encoding. Writing down a word such as "rivalry" does not elicit the same visual-motor-semantic connection that drawing a depiction or symbol of a rivalry would.

Moreover, Hellenbrand et al. (2019) suggest that generative drawing, specifically illustrations that are accurate to the text, require students to focus on specific details and then transfer them to visuals. Because accurate renderings require precision, multiple rereadings are necessary, influencing retention. Furthermore, Kellogg's (2008) Cognitive Developmental Perspective purports that the working memory has a limited storage capacity and once it is overwhelmed, writing fluency suffers. Thus, the central executive requires a "demand reduction." In the present study, the "demand reduction" takes the form of original artwork. The artwork also functions as "domain-specific expertise." Because students have focused on the material enough to generatively illustrate it (Hellenbrand, 2019), the ideas have been transferred to long-term working memory, leaving the short-term working memory available for the composition. Students in the present study who drew scenes or elaborate images for Assignment #2 received higher scores on their writing. Instead of summarizing the plot of *Romeo and Juliet*, they provided precise details related to character and setting as evidence for their argument. Recalling this information did not strain their short-term working memory because they had necessary language embedded in their prewriting image.

Van Waes and Leijten (2015)'s research on process fluency directly impacted the present study. After reading about keystroke data and P-bursts as methods to determine fluency, I returned to my data to gain a more nuanced insight into my students' fluency. The concept states that the longer a p-burst runs, the more fluent a writer is. In this sense, the students show definitive fluency growth in Assignment #2 as their burst lengths are over triple the duration of Assignment #1. Fittingly, like Van Waes and Leijten found a larger effect size at the character level, my students produced over triple the characters per minute, indicating that they took fewer pauses for less time. Alemu (2020) noted a similar observation when researching handwritten essays. He watched students "pen pause" while attempting to compose; in relation to Van Waes and Leijten's research, the pauses over a defined threshold indicated that students had "stalled" in their thinking, or as Bastug et al. (2017) noted, experienced a form of writer's block. Due to the timed nature and classroom setting of Assignment #2, students' affective states were likely impacted; however, Alemu recommends, and this study agrees, that well-composed prewriting may change students' perceptions on their abilities to perform well on higher stakes' writing assignments.

Even so, prewriting cannot account for all elements that influence affective stances towards writing. The Hayes Process Model (Hayes & Nash, 1996) component of the task environment breaks into the social and physical environments. In theory, the "task environment" encompasses what it outside of the writer such as collaborators, the audience, directions, drafts, a word processing program, etc. Yet, although not Hayes' definition, a task environment can be defined as the place where the task is completed, and this is the element that most greatly affected fluency. Students wrote Assignment #1 at home and Assignment #2 with limited time in class. Process data shows that students took an average of 8.92 breaks of about 5:44 while

composing Assignment #1. Assignment #2, however, averages 1.97 pauses at only 53 seconds a piece. This emphasizes how time and place greatly impact students' fluency. At home, students could pause for an hour at a time. In class, they paused for a couple minutes at most. Although this conclusion has little to do with artwork as prewriting, it is instrumental data about students' writing habits that will impact future classroom decisions.

Conclusion III

Students' positive affective behavior, including pride, acceptance, and creativity, spurred by an artistic assignment, led to greater quality in their writing.

Discussion

The current study sought to investigate how original artwork as a prewriting technique engaged students more than other forms of prewriting. This research question draws from teacher observation of how few students actually completed assigned prewriting when it took the form of graphic organizers, outlines, or even sticky notes. Despite the proven success of those methods, students' lack of completion demonstrated the desire for another a strategy that would fully engage them or present less cognitive strain. Eighty-three percent of students earned a classwork rubric score of a '4' or a '3' for Assignment #1; in class, students were quietly and diligently creating their masks. They asked one another for suggestions, but their conversations did not veer off-topic. Due to the artistic nature of the prewriting, students who usually asked to leave the room remained, and the ones who put their heads down accepted paper and colored pencils and sketched. Moreover, the fact that students not only completed the prewriting, but also completed it correctly, highlights a level of engagement not evident in previous assignments. Both prewriting assignments, the mask and the tombstone, received a "Focus" score, which directly referenced the requirements. If students included a majority of those requirements, it

proves they read and reread the instructions to ensure accuracy, an element of quality, which shows they cared about the work being produced. Assignment #1 students who scored a high rubric focus score also received a higher quality writing score (correlation coefficient: r= 0.738959001419726). Sixty-five percent of students who received high focus scores also earned higher writing scores. The prewriting assignments also received 'neatness' scores. One hundred percent of masks and 66% of tombstones earned a rubric score of '3' or '4,' emphasizing the pride students took in their work. Notably, the neatness percentage for the tombstone is lower, potentially because this artwork was not shared with the class: there was no time for a class discussion or presentations prior to the exam, nor was the artwork hung in the classroom as decoration. Because of this differing expectation, it is possible that students did not put in the same level of effort as they put forth for Assignment #1, which could explain why the correlation coefficients for neatness and focus only returned as moderately positive. Yet, as described above, for those students who had completed the difficult work of generating ideas before writing, referencing outside resources, like the artwork, lightened the strain on their central executive system during composition.

Lastly, engagement fostered artistic creativity which translated into more detailed commentary within the written pieces. Many students struggle to elaborate on their ideas. Once they state the basic thought and provide evidence, they are unable to connect them. This study found that the more creative the image, the more the student was able to expand in writing. For instance, in Assignment #1, a student transformed the mask into a pig to represent Napoleon from George Orwell's novel (1945), *Animal Farm* (Appendix D). She sketched playing card symbols near the pig's mouth. In her explanation, she wrote:

> …when Napoleon and other farmers were playing cards…. Both cards represent the Ace of spades that Napoleon and the other farmer pulled, however only one of them is drawn correctly…to symbolize that one of the cards is fake...The card symbols are drawn around the mouth to represent the lies coming out of [N]apoleon.

Here, the student examined the scene at the end of the novel, recognized Napoleon's manipulative nature, related it to how he conditioned the animals, and symbolized it through playing cards. Drawing the symbols by the mouth of the mask reminded the student to comment on a core character trait through description, not summary. Although these types of observations were more common for Assignment #1, most likely due to the level of focus and neatness of the prewriting, Assignment #2 still had superior examples. A student's analysis of *Romeo & Juliet* stated:

> [They] will side with their own [family] creating hatred amongst each other. Tybalt shows hatred towards the Montague family, he comments, 'Peace? I hate the word' (1.1.72-73)…not only does this create a grudge but also results in the death of loved ones…it destroys the connections with the children of the family..."

She derived this astute commentary from this illustration: "As two swords in the middle intersect, I use green to show immaturity and danger between the two families since they can't get over a foolish feud." Without the inspiration of the crossing swords, the color green, and the short quote from the text, the student may not have been reminded of the grudge's pettiness and how the true casualty in the drama was the children (Appendix D). Ultimately, students who were able to interpret their prewriting, regardless of its focus or neatness, produced quality essays; however, the students' who incorporated more creative elements included greater sophistication in their commentary.

de Leur et al. (2020) reported drawing students in their study responded they had more interest in the task than those who wrote. Additionally, in the interviews, students confessed that they interpreted writing to be akin to summary whereas the illustration demanded insight. de Leur et al.'s student reflections are evident in the current study as well. More students completed the prewriting and earned higher scores on it than the actual writing for both assignments. In the writing portion for Assignment #2, many students reverted to summarizing the plot of *Romeo and Juliet* instead of analyzing the tombstone drawings, which were intended to provide them with ideas about the party responsible for the tragedy, not a reminder of the storyline. Comparatively, Zumbrunn et al. (2017) revealed that students are most likely to engage when they have a choice or an interest in the task. In the present study, students were given guidelines for both assignments, yet both allowed for choice and creativity. However, Assignment #1 permitted the mask to be personalized in a way the tombstone did not. Perhaps this restriction impacted the way students viewed and interacted with Assignment #2. Zumbrunn et al. also concluded that students' writing confidence level impacts their writing effort. After the document analysis, it is evident that students put forth more effort in Assignment #1 than they did in Assignment #2. There are various reasons for this, such as the time of the year, the genre of writing, the lack of peer-sharing, etc. Yet, it is clear that students were more comfortable discussing their illustrations than they were using them as a key to analyzing another text.

A goal of this study was to engage students in the act of prewriting, which Abdul Hadi et al. (2024) state is the phase in the writing process where students struggle most. Yunus et al. (2018) reveal that students who have a positive perception of writing tend to be more confident writers; prewriting leads to less wasted time during exams and improves organization and structure. In the current study, students who came to the final exam with well-conceived

prewriting worked more diligently than others. Their paragraphs had clear content divisions and included only necessary summary. de Milliano et al. (2017) calculated Pearson correlations to determine if engagement variables contributed to students' writing development over a three-year period. Students' intrinsic value and time-on-task had significant correlation in Social Studies, but none of the variables related to improvement in Language Arts. In the present study, different engagement factors were identified (classwork, prewriting quality, focus, and neatness) and correlations computed for each assignment. All categories yielded a high positive correlation coefficient for Assignment #1. Assignment #2 ran the same factors (except classwork engagement) and found only moderately high positive correlations. Given these numbers, students were more engaged with the method the first time they encountered it, but again, possible external reasons for this have been discussed.

Non-cognitive internal factors, namely, affective states (Krathwohl et al., 1973), impact how students perceive tasks. If students have little interest, low motivation, and display feigned or negative emotion towards learning situations, they will be less likely to engage cognitively with them. The Taxonomy of Educational Objectives presents a hierarchy to integrate the two states. In the current study, more than half of the students moved from the lowest level, *Receiving* (awareness of the skill) to the *Valuing* (successfully use of the skill again) level, which was the goal of this research. Although not all students reached this level, they did attain *Willingness to Respond* because they did complete the task, even if the reason was because it was assigned. Furthermore, art as prewriting may not be a strategy that is useful for all students, especially those who are more verbally inclined. Assignment #2 saw three students produce typical outlines/bulleted notes on the tombstones instead of images. Affective states may dictate which type of prewriting students are most comfortable with in which situation. Moreover,

Hayes and Nash (1996) define motivation within the Individual component of the Process Model as goal oriented. They mention that affective states set the tone for how students perceive their writing skills, and in general, this impacts this mindset. Students who have set goals for their writing before composition tend to have more confidence because they are not straining their central executive to make decisions that should have been made during the prewriting phase. In the review of students' writing for this research, those with positive affective states scored higher, turned in completed work on time, and composed more fluently.

Recommendations for Further Research

Based on the findings of this study, further research is recommended to determine the full impact of original artwork as a prewriting strategy in the high school classroom. An initial avenue for additional exploration is the concept of genre. The present study focused on explanatory writing in Assignment #1 and argumentative in Assignment #2. Students appeared to prefer the artwork method in conjunction with the explanatory genre because the goal of the writing was to describe their illustration in more detail. In the argumentative essay, students were responsible for interpretation in connection with a specific text, arguably a more difficult skill. Future studies should focus on teaching students the skills to analyze the argument or claim made within professional pieces of art, which can then be transferred to their own work. This would account not only for the change in genre, but also for the growth in students' confidence in their evaluation of abstract ideas.

Upcoming studies related to prewriting artwork should consider a control group. The conclusions in the present study are drawn from teacher observation of the students' behavior throughout the school year. Having access to concrete data for comparison would add validity to the study. Instead of comparing students' progress between assignments, researchers could view

the differences among different types of prewriting methods to determine if art is truly more engaging.

Finally, future research should determine the "task environment" (Hayes & Nash, 1996) before the start of the study. In the current inquiry, the physical location was not considered, and this greatly affected fluency data. At home, students wrote at leisure within the timespan of a week (Assignment #1); in school, most students composed the essay in under 45 minutes (Assignment #2). Instituting a stable environment would allow for a more focused interpretation of fluency and genre.

Recommendations for Teachers

The results of this study warrant several recommendations for teachers' consideration during writing instruction. To start, teachers should require prewriting in some form for all major writing assignments. If possible, teachers should encourage students to prewrite for all writing as well. Prewriting alleviates emotional stress, preventing writer's block and aiding in structural organization (Bayat, 2014). Although the focus of this study was the use of original artwork as prewriting, it has been acknowledged that this method may not suit every student, so teachers should be open to experimenting with a variety of prewriting forms and be willing to teach students how to approach them. It is only once students comprehend prewriting's value that it will automatically become part of their writing process. That said, teachers should permit students to use the form of prewriting that best aids in students' personal composition process. However, teachers must review the prewriting and compare it to the final draft to determine its effectiveness.

A second recommendation concerns the where and when students compose writing. Based solely on the results of this study, students' in-class writing fluency, scores, and

completion rates were higher that the writing composed outside of the classroom. Thus, more writing should be done during class. Although this is time-consuming and takes away from instruction, it provides students with a focused period of time for composition without outside interruptions, and this type of writing demonstrates their true abilities, which aids classroom teachers in tailoring their instruction to their specific set of students.

Lastly, more teachers should be aware of The Taxonomy of Educational Objectives: Affective Domain (Krathwohl et al., 1973) to illicit buy-in from their students. In the alignment of the cognitive and affective domains, students discover the motivations for their academic and emotional behaviors and how they impact their educational success. In this day-and-age of social-emotional learning, affective-cognitive states should receive more attention as they could explain the ‘why’ behind students’ actions, which may foster better teacher-student relationships. Understandably, teachers do not need more extra work to complete outside the classroom, so they should advocate for training on this topic to replace a longstanding, well-learned one.

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Appendix A

Rubric: Assignment #1

Neatness

4 pts	3 pts	2 pts	1 pt
Is the mask exceptionally attractive in terms of design, layout, and neatness?	Is the mask attractive in terms of design, layout and neatness?	Is the mask acceptably attractive though it may be a bit messy?	Is the mask messy and appear to have been created right before class?

Paragraph Content

4 pts	3 pts	2 pts	1 pt
Do the 3 paragraphs clearly address the 3 questions and supply excellent detail about each topic?	Do the 3 paragraphs address the 3 questions and supply adequate detail about each topic?	Are there three paragraphs, and/or do they include a lack detail and elaboration?	Are the paragraphs missing?

Mechanics

4 pts	3 pts	2 pts	1 pt
Do the paragraphs contain minimal mechanical errors (spelling, punctuation, grammar, capitalization, etc...) that do not hinder structure or understanding?	Do the paragraphs contain few mechanical errors (spelling, punctuation, grammar, capitalization, etc...) that do not hinder structure or understanding?	Do the paragraphs contain some mechanical errors (spelling, punctuation, grammar, capitalization, etc...) that may hinder understanding?	Do the paragraphs contain numerous mechanical errors (spelling, punctuation, grammar, capitalization, etc...) that impede understanding?

Use of Class Time

4 pts	3 pts	2 pts	1 pt
Did the student use time well during the class period? Focus on getting the project done? Never distract others?	Did the student use time well during the class period? Was there usually focus on getting the project done and never distract others?	Did the student use some of the time well during the class period? Was some focus on getting the project done but occasionally distracted others?	Did the student sleep, play computer games, not make any progress, etc?

Focus of Mask

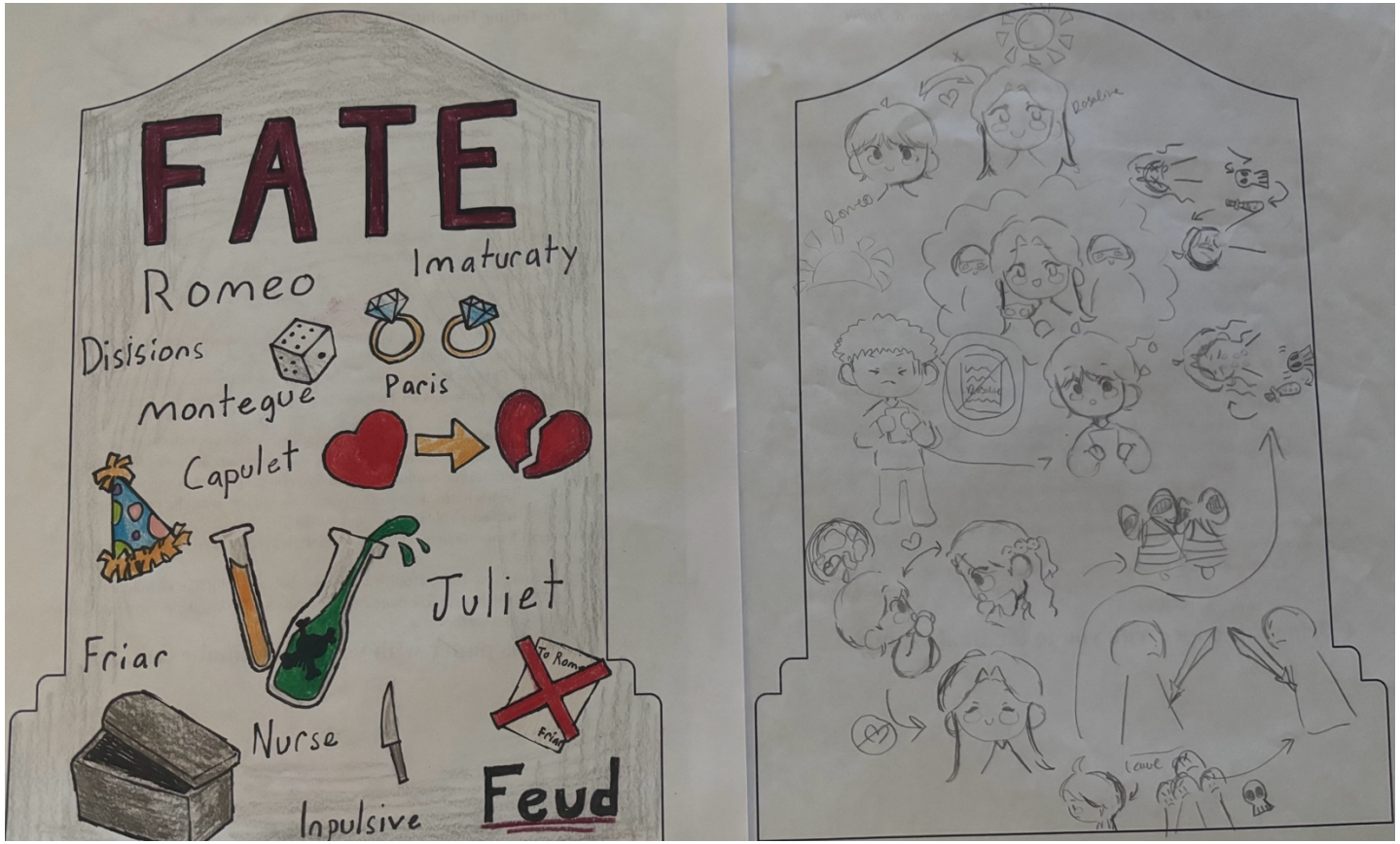
4 pts	3 pts	2 pts	1 pt
Does the student's mask mask clearly illustrate a universal theme, the traits/qualities of a character, or the inner-workings of their mind?	Does the student's mask somewhat illustrate a universal theme, the traits/qualities of a character, or the inner-workings of their mind?	Does the student's mask attempt to illustrate a universal theme, the traits/qualities of a character, or the inner-workings of their mind?	Is the student's mask a collection of random thoughts and ideas that once in awhile hit the target, but it's clear that hitting the target was accidental and a one-time thing?

Appendix B

Teacher Feedback Samples of Assignment #1

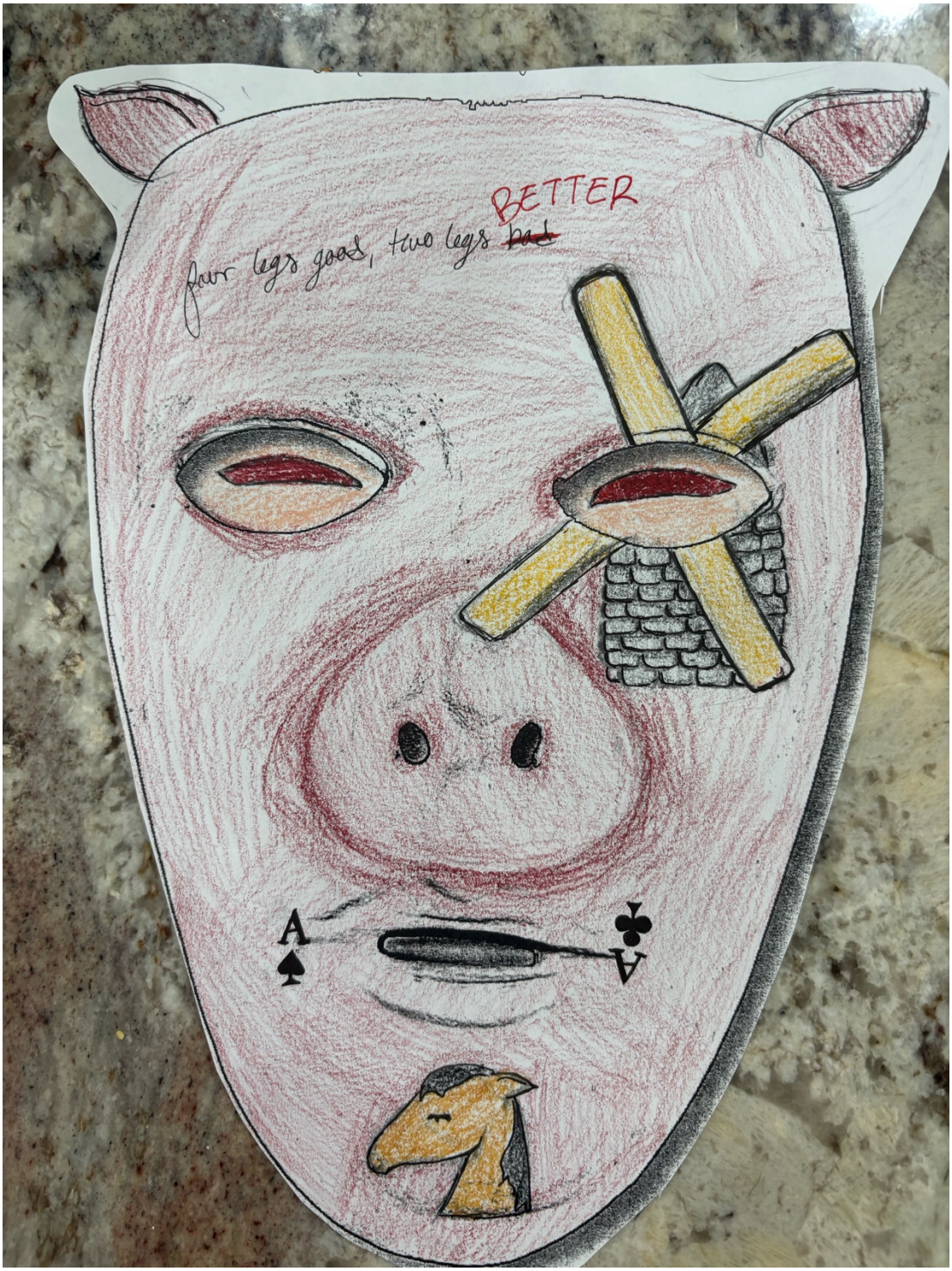
Appendix C

Samples of Assignments #2



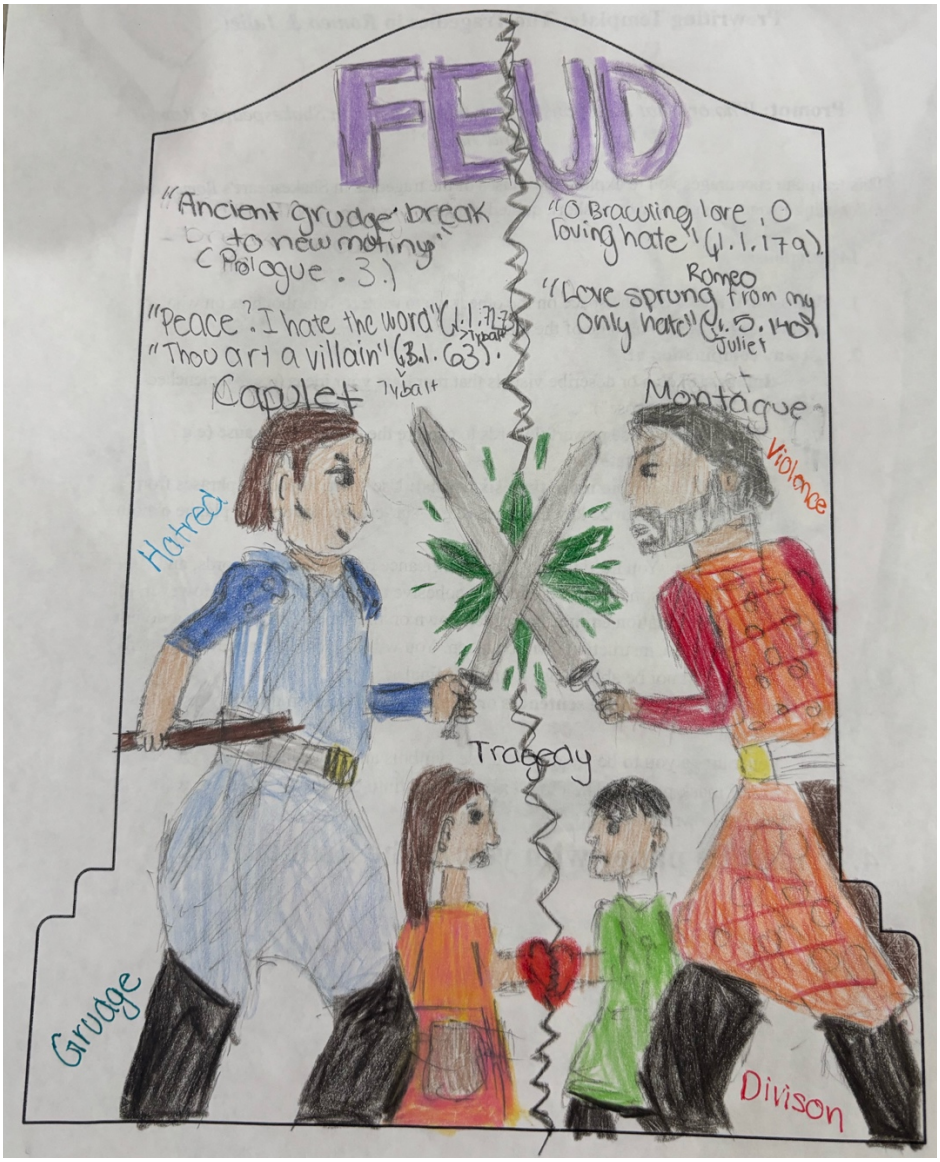
Appendix D

Assignment #1: Animal Farm Mask



Appendix E

Assignment #2: Tombstone Commentary Example



Appendix F

Letter of Permission to Use Adapted Materials

Alexis Mojka

William Paterson University, New Jersey

September 24, 2025

Dear Mr. Fejes,

I am completing a Masters Thesis at William Paterson University entitled "The Impact of Original Artwork as a Prewriting Strategy." I would like your permission to reprint in my thesis the following materials found/based on your *Lord of the Flies* Weebly:

- A modified version of the mask requirements
- A copy of the mask template
- A modified version of the grading rubric

It will be clearly stated in the thesis that the assignment was adapted from materials found on your website.

The requested permission extends to any future revisions and editions of my thesis, including nonexclusive world rights in all languages, and to the prospective publication of my dissertation by ProQuest through its UMI® Dissertation Publishing business. ProQuest may produce and sell copies of my thesis on demand and may make my dissertation available for free internet download at my request. These rights will in no way restrict republication of the material in any other form by you or by others authorized by you. Your signing of this letter will also confirm that you own the copyright to the above-described material.

If these arrangements meet with your approval, please sign below where indicated, and scan it back to me at this email address.

Sincerely,

Alexis Mojka

PERMISSION GRANTED FOR THE USE REQUESTED ABOVE:

Mr. Fejes, owner of Weebly from which *Lord of the Flies* Mask project materials were borrowed/ adapted

By: Michael J Fejes

Title: 8th-grade ELA teacher

Date: 9/24/25