



# The POW+TREE Strategy's Effects on the Argumentative Writing of Struggling Secondary Students

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## Abstract

The present study aims to evaluate the effects of an argumentative writing strategy (POW+TREE) on four struggling ninth graders' ability to produce persuasive texts regarding their point of view on different questions. I applied a multiple-baseline design to evaluate outcomes across participants. The results indicate the intervention helped students to write more extensive essays, and evidence shows an increase in quality. Follow-up data suggest the effects remained after the treatment ended. I also discuss future research and the findings' implications for practitioners.

Keywords: *argumentative writing, low performance, secondary students, single-case study, strategy instruction*

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## Introduction

MacArthur et al. (2006) rightly called writing “one of humankind’s most powerful tools” (p. 1). Forming sentences to produce texts comprehensible to readers remains indispensable in today’s society. People often view writing as equivalent to thinking (Foerster et al., 2000) and as a key way in which people reveal their skills and their knowledge (Day, 2018). Composing a text helps to organize thoughts. Whatever people write about, they must structure and phrase ideas in a clear way. Thus, text production and reflective thinking relate to each other. As a creative outlet, writing also helps develop imagination. It forms people into who they are. Text production appears in almost all areas of life, so people must master this skill to succeed in school and in the workplace to become a full member of society (Grünke & Lennard-Zabel, 2015; Fayol et al., 2012).

Composition skills evolve in stages. Once children acquire all prerequisite competencies necessary to write, they start in elementary school by producing simple narratives told from a first-person perspective. Later, they can author descriptive, expository, technical, or poetic texts. Argumentative writing often appears as the most ambitious genre. Students usually cannot produce such essays at an acceptable level of quality until they reach puberty (Coirier & Golder, 1993; Mason, 2013). In an argumentative text, individuals state their opinions to influence readers. After making a claim about an issue, they must gather evidence to support the claim. They must write convincingly to persuade their audience to agree. Writing one or two short reasons is

usually insufficient to make a case. Instead, a writer must elaborate on well-considered points to fulfill the essay's purpose (Newell et al., 2015).

Most students acquire at least moderate argumentative writing skills during their secondary-level education. However, many do not. These learners could possibly compose simple stories or other less ambitious texts, but argumentative essays seem out of their reach. They have difficulty writing down their ideas with the necessary breadth and depth. Instead, they produce very short treatises with little substance (Büyüknarçi & Grünke, 2019; Deatline-Buchman & Jitendra, 2006; Ferretti et al., 2007).

Students struggling with argumentative writing need explicit instruction for using a specific strategy as soon as problems appear (Mason, 2013). Respective meta-analyses suggest that teaching learners to follow specific steps needed to create an acceptable text significantly helps them catch up with expectations (e.g., Cook & Bennett, 2014; Datchuk & Kubina, 2013; Gillespie & Graham, 2014; Rouse & Sandoval, 2018; Rogers & Graham, 2008). The most efficient instructional framework in this context is the self-regulated strategy development (SRSD) model from Graham and Harris (2005). This approach breaks the teaching process into six distinct parts: (a) determine the skills needed to acquire a given tactic and assess whether students possess them, (b) introduce the particular strategy, (c) demonstrate how it is applied, (d) help students memorize the strategy's steps, (e) scaffold them through the process, and (f) monitor students while they try using the strategy independently.

According to Mason (2013), the prime approach for teaching argumentative essay skills is POW (pick an idea, organize notes, and write and say more) and TREE (topic sentence, reasons, explain reasons, and ending). This partial technique can help in planning various kinds of texts. Specifically, TREE helps students compose solid argumentative essays by reminding learners to tell what they believe (topic sentence), provide three or more points to support their position (reasons), justify their rationale (explain reasons), and create a convincing conclusion (ending; Shora & Hott, 2016).

A broad empirical knowledge base exists concerning the effectiveness of POW+TREE with children and youth who demonstrate behavioral and emotional difficulties (Cramer & Mason, 2014; Garwood et al., 2019; Hauth et al., 2013; Mason & Shriner, 2008; Mastropieri et al., 2014). Results indicate the strategy as feasible, well-accepted, and potent while working with the aforementioned population. However, students with primary learning problems need support to become competent argumentative writers at least as much as those with patterns of misbehavior. These children and youth have fundamental difficulties in acquiring, organizing, retaining, understanding, or using information (Loizou & Laouris, 2011). Because these students cannot effectively structure their learning themselves, they need someone to explicitly design instructional experiences, explain things directly, model the necessary skills, and provide scaffolded practice (Kearns, 2018).

The benefits of POW+TREE have been demonstrated with these students throughout elementary and middle school (Benedek-Wood et al., 2014; Ciullo et al., 2021; Mason et al., 2013; Miller & Little, 2018). Unfortunately, only one study has focused on the crucial age group between 15 and 19 (Hoover et al., 2012). This phase comprises instrumental years for teenagers to mature and gain skills needed to become responsible adults (Shaffer & Kipp, 2013). They must develop the ability to present persuasive reasons for a particular position after extensive thought while weighing various viewpoints. Adolescents must learn to assert themselves in a civilized way to step up for their own interests, shape their environment, and actively participate in politics and in society (at least in a small context). However, to my knowledge, only one study on POW+TREE has focused on students who demonstrate serious learning difficulties (especially in formulating elaborated and detailed argumentative texts) at the beginning of this crucial phase. In this single-case analysis, Hoover et al. (2012) involved four high-school students between 16 and 19 years with learning disabilities. The intervention led to a distinctive increase in the number of words the participants wrote.

This research thus aims to evaluate the effects of POW+TREE on the performance of 15-year-old adolescents with writing difficulties. I used a single-case approach to test whether teaching the strategy would lead them to compose more extensive argumentative texts.

## Method

### Participants

The participants attended a ninth-grade class at a comprehensive school in a large metropolitan city in western Germany. To be involved in the study, they had to experience considerable learning problems, especially in written expression. I asked the whole class to write a short argumentative essay on a theme from a choice of different options. Two experienced research assistants rated the texts independently based on a simple rubric (<https://www.pinterest.de/pin/427067977144537447/>). This instrument groups essays into four categories: "exceeding standard," "meeting standard," "approaching standard," and "not meeting standard." The research assistants compared their codings and resolved any discrepancies through discussion and consensus. Students with texts rated as "not meeting standards" fit the study. According to the teacher, all the participants experienced writing difficulties and multiple academic problems.

Of all the candidates, I selected those who rarely missed school and seemed motivated to take part in the training. The class register had to indicate 3 days or fewer of absences during the past 3 months. In addition, the teacher filled out a questionnaire comprising eight items ("The student is generally very motivated," "The student is generally capable of staying on task for at least 10 minutes," "The student generally abides by classroom rules," etc.) on a four-point scale for all candidates. Everyone awarded the most positive scores in at least five of the eight items became eligible for the study.

Eventually, six participants fulfilled all the inclusion criteria, but I only involved four students in my single-case analysis. One individual from the original sample missed over three sessions due to illness. Another one appeared too capable for my simple training. His teacher viewed him as a low performer, and results from the initial writing task and from the standardized tests (see below) suggested he struggled with literary language, but his behavior during baseline did not mirror this. Even prior to the intervention, his essays were three to four times as long as those produced by other participants. The student insinuated that he did not perform well under pressure. He appeared as an underachiever who could not perform at his best when he felt under compulsion. However, with only another classmate and an instructor in the room, he felt much more comfortable than in a classroom or a test situation. Even though he continued to participate in the intervention, I did not include his data in the analysis, because right from the beginning, he performed much better than the rest of the sample.

I conducted a reading and a spelling test with the six students: the Reading Test Battery for 8th- and 9th-graders by B auerlein et al. (2012) and the Hamburg Spelling Test by May et al. (2018). A summary of the most important data for study participants appears in Table 1.

Table 1. *Personal Data of Participating Students*

Student	Grade	Age	Gender	Language	Reading <sup>1</sup>	Spelling <sup>2</sup>
A	9	15	male	Arabic	20	41
B	9	15	female	German	23	59
C	9	15	male	German	43	51
D	9	15	female	German	37	37

<sup>1</sup>T-values for reading fluency; <sup>2</sup>T-values for phonetically accurate spelling

Student A grew up in an Arabic-speaking household. In his spare time, he enjoyed writing songs and creating his own lyrics. His teacher described him as very motivated and eager to learn. Because of his passion for music and for writing lyrics, he easily showed interest in training sessions on text production. Student B had an official diagnosis of dyslexia. However, her teacher viewed her as very willing to engage in classroom activities. She usually appeared very conscientious and assiduous, but she had difficulty with tasks that require a speedy approach. In addition, she demonstrated low self-esteem. Despite this, she always appeared grateful if anyone sat with her to help with her learning. Student C suffered from motoric tics and moderate articulation problems. However, these difficulties had no relation to his academic problems. His teacher described his motivation as high. The last participant (Student D) experienced emotional stress due to parental conflicts at home. Her teacher described her as highly dependable and usually ambitious. However, because of her challenging situation at home, her motivation had declined in recent months.

## Design and Measures

I applied an extension of single-case AB design (multiple baseline design across participants) with a baseline (Phase A), an intervention (Phase B), and three follow-up measurements (Phase C; Kennedy, 2004). This allowed me to examine the strategy across students. The training's beginning was staggered, so two participants started after the third baseline probe, two started after the fourth, and two after the fifth. I randomly allocated participants to these options. However, as mentioned above, I did not include the data of two students in the analysis.

I prepared 30 different writing prompts in the form of questions meant to encourage participants to produce relatively long texts (e.g., "What is one thing you wish was different about our school," "What do you feel will distinguish your generation from the others that have come before," and "What do you think our community needs?"). They chose one of two options on slips of paper. They never received the same prompt twice. Participants could take as much time as they liked to produce their texts.

The total number of words written (TWW) served as the primary way to capture the dependent variable (argumentative writing performance). TWW comprised the number of words written in an essay (see Furey et al., 2016). Titles were excluded. However, incorrectly spelled, nonsense, or illegible words all counted toward the TWW. Two research assistants scored the texts independently from each other. Their appraisals agreed 100% of the time.

Most previous studies on the benefits of POW+TREE also used TWW to measure participants' argumentative writing performance, because students who compose only short texts first must learn to write more before attending to the quality of their essays. Teachers have something to work with and can help with revising only if students produce papers of a sufficient length. However, I wanted to include the quality aspect as a side note. Thus, I had two research assistants rate every text via a self-developed rubric (available from the author upon request). This instrument appraised the introductory sentence, the final sentence, the arguments, the explanations, and the vocabulary. Writers can receive between 0 and 10 points (high numbers indicate high quality). The research assistants evaluated each essay independently and resolved any discrepancies through discussion.

## Procedures

Two female graduate students studying special education served as instructors. In preparation for the intervention and assessment, I briefed them extensively during three 1-hour training sessions. The initial six participants were taken in pairs to the school's library, where one of the university students taught them. During baseline conditions, the adolescents played card games with the instructors for 20 minutes to control for attention effects. Subsequently, participants were asked to compose an argumentative text responding to a writing prompt they chose from two options (see above).

Every intervention session also lasted 20 minutes. As in baseline, the dependent variable was measured directly afterward. In lesson one, the instructors explained to students (who possessed all the skills required to productively engage in the task; phase one of the SRSD model) why they need the ability to make a case on their own behalf to get by in today's world. They elucidated that argumentative texts help in organizing one's reasoning. The instructors defined this genre as writing in which someone makes a claim and supports it with evidence and logic. Students were told the strategies they learn will notably improve their writing abilities (phase two of the SRSD model). Next, the instructors presented participants with two writing prompts (e.g., "Should students have a greater say in what they learn?") from a list prepared in advance. They then voiced the four actions needed to apply the POW strategy: pick an idea, organize notes, and write and say more. To help participants remember the three actions, they could refer to a poster that was placed on the table. The instructors modeled the strategy verbally using one of the two prompts (phase three of the SRSD model). They then reiterated the three steps by going over the poster and asking the students to repeat them without looking at it (phase four of the SRSD model).

Lesson two started with a discussion of the texts the participants had written the day before, identifying any evidence that the student adhered to the POW strategy. The instructors scaffolded the application of the process by asking constructive questions (phase five of the SRSD-model). When someone needed assistance applying the three steps, a respective sub-process was modeled again.

The next session (lesson three) began with a review of the writing product students had submitted the previous day. Subsequently, the instructors introduced the TREE strategy and its four parts (topic, reasons, ending, and examine) in a manner similar to how the POW strategy was inaugurated (Phases three to five of the SRSD model). Lesson four focused on the instructors modeling the two strategies together (after a short evaluation of texts the participants had written the day before). Every remaining session involved discussing previous writing products and practicing using all seven steps, while close guidance was gradually diminished (phase six of the SRSD model).

### Procedural Fidelity

During 10 intervention sessions, a research assistant used a checklist to measure the instructors' ability to follow the line of action I asked them to abide by during the briefing meetings preceding the treatment. I calculated procedural fidelity by dividing the number of steps completed by the number of steps outlined in the checklist. It equaled 100%. This indicates that both instructors administered the intervention with fidelity and in the same manner over time.

### Social Validity

At the end of the study, one instructor asked participants about their attitudes toward the use of the POW+TREE strategy. This was done to capture the acceptability and satisfaction with intervention procedures from the students who received the training. An interview form provided the wording for each question and a space for answers.

## Results

As seen in Table 2, each case in Phases B and C had a higher performance than in Phase A (due to illness, one measurement is missing for Student C in Phase A). The most impressive treatment gains appeared for Students A and B. Their longest texts during baseline comprised only 31 and 34 words, and their best achievements during Phase B were 130 and 126. Upon terminating the training, their performance dropped markedly. Even for Students C and D, however, the intervention seemed to have some effect. The average

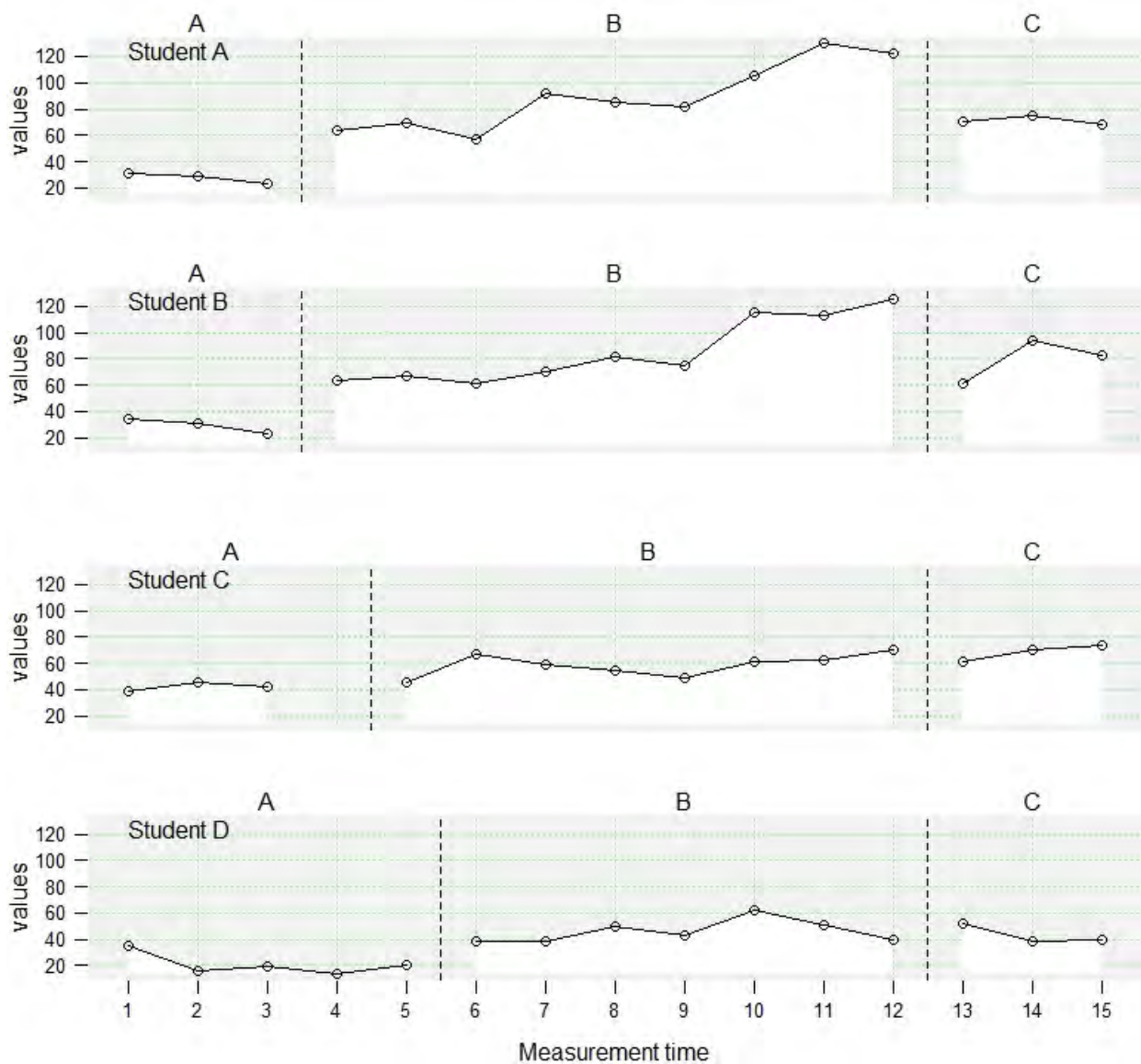
TWW indicates that the mean gain from baseline to intervention equaled 223.67% for Student A, 192.47% for Student B, 37.92% for Student C, and 122.55% for Student D.

Table 2. *Descriptive Data of Total Words Written for Each Participant*

	Student A	Student B	Student C	Student D
Min. A-Phase	23.00	23.00	39.00	14.00
Min. B-Phase	57.00	61.00	45.00	39.00
Min. C-Phase	68.00	61.00	61.00	38.00
Max. A-Phase	31.00	34.00	46.00	35.00
Max. B-Phase	130.00	126.00	70.00	62.00
Max. C-Phase	75.00	94.00	74.00	52.00
M A-Phase	27.67	29.33	42.33	20.80
M B-Phase	89.56	85.78	58.38	46.29
M C-Phase	71.33	79.33	68.33	43.33
SD A-Phase	4.16	5.69	3.51	8.29
SD B-Phase	25.36	25.19	8.58	8.56
SD C-Phase	3.51	16.80	6.66	7.57

Figure 1 shows the increases and decreases in performance during the three phases. The baseline measures seemed quite stable (except for Student D, who started with a long story and then continued to produce comparably short texts). Students A and B demonstrated a clear upward trend in TWW during the intervention. On the other hand, Students C and D did not show the same improvements. The performance of Students A and B dropped after the treatment was terminated, but Students C and D composed stories during the maintenance phase of comparable length to those in Phase B.

Figure 1. Total Words Written for Students A, B, C, and D.



To facilitate a dichotomous decision regarding the presence or absence of an immediate effect, a progressive effect, and an overall effect for an A–B comparison, I applied the “Visual Aid Implying an Objective Rule” (VAIOR) from Manolov and Vannest (2019). This online tool (<https://manolov.shinyapps.io/TrendMAD/>) for summative evaluation provides a benchmark for determining whether a treatment worked. According to the analysis, every student met every criterion for immediate, progressive, and overall effects. Thus, all participants demonstrated a noteworthy overall improvement in performance upon starting the training due to a positive instant leap and a positive change of the output curve.

Table 3 presents the results for some of the most commonly used non-overlap methods in single-case research. The indices I applied comprised the percentage of non-overlapping data (PND), the percentage of all non-overlapping data (PAND), the percentage of data exceeding the median trend (PEM-T), the non-overlap of all pairs (NAP), and the Tau-U (Lenz, 2013; Parker & Hagan-Burke, 2007; Parker et al., 2011). All of these

non-overlap metrics serve the purpose of describing the magnitude of an intervention effect. I only compared Phases A and B and did not consider the follow-up measures.

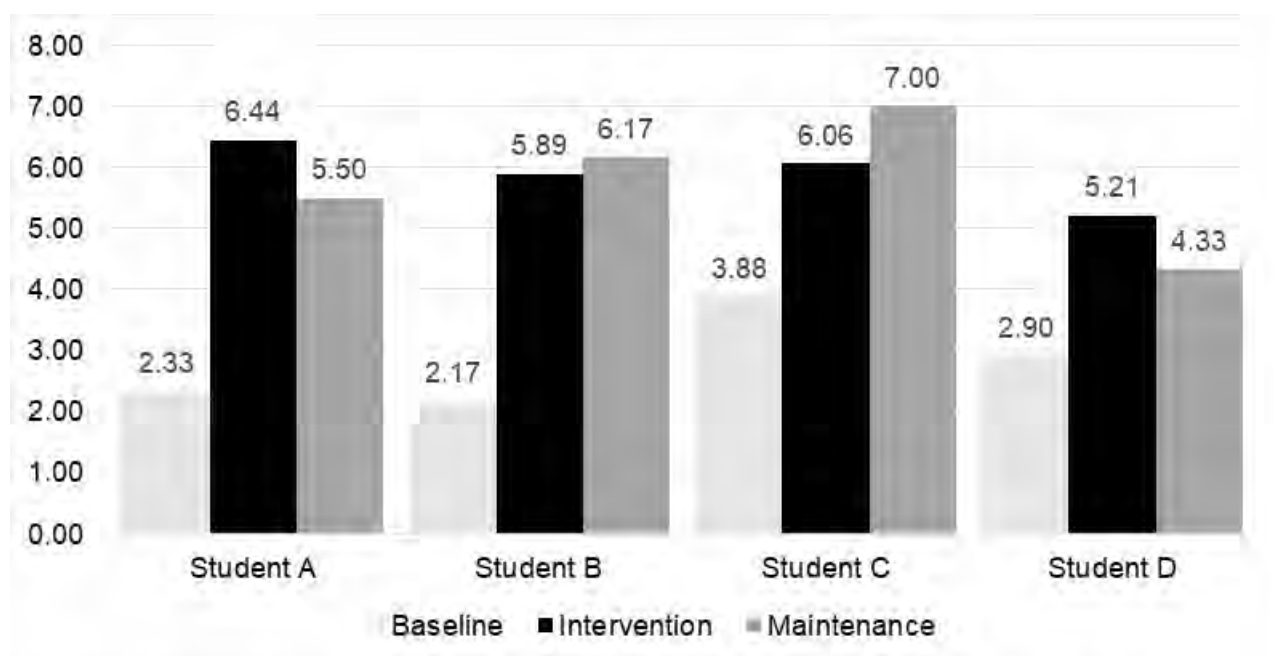
Table 3. *Overlap Indices for Total Words Written (TWW)*

	<i>PND</i>	<i>PAND</i>	<i>PEM-T</i>	<i>NAP</i>	<i>Tau-U</i>
Student A	100	100	100	100	0.82
Student B	100	100	100	100	0.88
Student C	87.50	81.82	75.00	91.67	0.50
Student D	100	100	100	100	0.68

The information in Table 3 indicates that participants seemed to benefit remarkably from the treatment. Three of four students reached the highest possible outcome in PND, PAND, PEM-T, and NAP. According to common conventions (see Tarlow, 2017), a Tau-U between .66 and .92 constitutes a medium or high intervention effect. Again, three of four participants fell within this category. Unlike methods mentioned before, Tau-U does not only consider data overlap but combines the non-overlap data between phases with the trend from within the intervention phase (Brossart et al., 2018). The aggregated Tau-U for all participants (A vs. B + trend B – trend A) was 0.75 (large effect; Vannest & Ninci, 2015).

Figure 2 gives a quick overview of the qualitative evaluations' results. I only reported average scores without giving further details because the intervention did not focus on improving the essays' quality but on helping the participants write more extensive texts. As Figure 2 shows, scores from intervention and maintenance clearly exceeded those from baseline. Comparing Phases A and B, the percentage increase equaled 176.39% for Student A, 171.43% for Student B, 56.19% for Student C, and 79.66% for Student D. When contrasting Phases A and C, calculating the relative gains yielded scores of 136.05% for Student A, 184.33% for Student B, 80.41% for Student C, and 49.31% for Student D.

Figure 2. *Qualitative Writing Scores for Students A, B, C, and D.*





All four participants completed the social validity interview. They all indicated they enjoyed the training. The responses suggest the students liked the intervention and had fun. They all expressed pride in their accomplishments and would recommend the training to their friends.

## Discussion

The purpose of this single-case analysis aimed to evaluate the effects of an argumentative writing strategy (POW+TREE) on the essay length of 15-year-old secondary students with problems producing texts. Similar to previous research (Benedek-Wood et al., 2014; Ciullo et al. 2021; Hoover et al. 2012; Mason et al. 2013), this study found that the approach helps in teaching struggling learners to compose more extensive treatises. A visual analysis speaks to the existence of a functional relationship between independent and dependent variables. Not all participants seem to have profited to the same extent, but none appeared to have zero benefit. A data analysis using VAIOR confirms this observation. Some effects became unstable over time, but none of the participants returned to baseline level after the treatment ended. A decrease in performance upon termination of the training could be due to the students still needing a little more assistance. The overlap analysis revealed that three of four participants achieved the highest PND, PAND, PEM-T, and NAP indices possible. One adolescent (Student C) fell short of the target, but he managed to show acceptable enhancements.

The supplementary qualitative analysis found that all participants demonstrated markedly better outcomes during intervention and maintenance than during baseline. Thus, the training seems to have helped the students produce longer texts of obviously higher quality. Fortunately, everyone rated the intervention favorably during the social validity interviews. This is not a minor issue. Social validity is an important indicator of how well a treatment is embraced by those who are targeted to benefit from it. If an intervention is effective but not accepted by participants, the success of its implementation is highly questionable.

This single-case analysis offers promising findings, but this low-key study had few participants and lasted only 3 weeks. Thus, I cannot make strong statements about the effects of POW+TREE on the argumentative writing of adolescents based on the present results. More research is needed to confirm that the strategy really elicits noteworthy improvements in 15-year-old struggling writers. Moreover, future studies must focus on long-term benefits to determine whether any gains in writing performance last longer than a couple of days.

In addition, more research should include samples from different populations. Here, I chose adolescents with high motivation but low writing skills. Admittedly, these criteria were tested in a nonclinical way. I used simple rubrics, the class register, the teacher's judgments, and the results of two standardized tests for evaluations. One participant had been diagnosed with dyslexia, but the others had no official special needs. However, this does not mean that they did not have a learning disability or a related disorder. Instead, it could result from the widespread tendency in German schools to avoid diagnosis and, thus, stigmatization. However, I should have probably applied additional standardized instruments to determine whether the students had a diagnosis related to academic problems. Future studies must characterize their samples more precisely and use more objective ways to determine whether an individual has a special need. Thus, more research can emerge concerning which distinctive and well-defined groups benefit from POW+TREE and to what extent.

While reflecting on this study's limitations, one last issue pertains to measuring the dependent variable. Many school-related competencies (like reading speed, spelling accuracy, or math fact fluency) are easy to capture, but argumentative writing performance is different. I focused on productivity (TWW), and I can easily cite a coherent reason to justify this choice. However, previous studies on POW+TREE or on other strategies for helping students produce better essays that influence an audience on an issue show that other options are possible (and reasonable).

Despite shortcomings, this study offers valuable advice for practitioners serving secondary-school students who struggle with argumentative writing. It demonstrates how to quickly and readily make a notable difference. Practitioners can easily implement this cost-effective intervention, and briefings took only a short time. The treatment was applied by graduate university students rather than fully licensed teachers, so classroom assistants, interns, parents, or maybe even peers could hopefully execute it as well. If students could pair up so that a struggling learner works with a high performer, everyone would benefit. Researchers should explore the practicability of various low-threshold options in the context of argumentative writing instruction.

In conclusion, adolescents must learn fundamental argumentative writing skills, and this cannot be treated as a minor aspect of education. On the verge of adulthood, these young people will soon govern the destiny of our society. We must prepare them for that. The famous Scottish philosopher James Beattie (1809) once stated: "The aim of education should be to teach us rather how to think, than what to think; rather to improve our minds so as to enable us to think for ourselves, than to load the memory with the thoughts of other men" (p. 33). Learning to compose convincing argumentative texts does just that.

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