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Predictors of the Argumentative Writing Based on Multiple Texts: Individual and Process Variables

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ABSTRACT

This study aims to determine individual and process differences that influence argumentative writing with multiple texts. The participants of this study, which used a predictive correlational design, were 101 high school graduates and undergraduate students from two provinces in southeastern Turkey who voluntarily participated in the study. The data were obtained from argumentative essays written by the participants after reading source texts, as well as from a topic interest scale. The participants read five different source texts with different claims related to climate change and global warming, and then they wrote argumentative essays evaluating the claims in these texts. Pearson correlation and hierarchical regression were used to analyze the data. Generally, findings indicated that students were not sufficiently successful in argumentative writing with multiple texts; both demographic characteristics and certain individual variables affected composition length. Topic interest, composition length, source content citation, and addition frequency variables accounted for approximately 41% of the variance in text-based argumentative writing. The findings of the study highlight the variables that are effective in text-based argumentative writing tasks and discuss them within the framework of the multiple-text literature.

Keywords:
Multiple text, multiple sources, text-based argumentation, predictors of argumentation

1. Introduction

The concept of multiple texts refers to a collection of texts taken from two or more sources that address the same topic or situation (Kurnaz, 2020). If a tweet, a passage from a textbook, and an article from a website, all discussing the same topic, are examined and read together, it becomes a multiple text; in other words, a multiple source. Multiple texts can contain both supporting and complementary information as well as conflicting and inconsistent information (Bråten et al., 2014).

Reading multiple texts is an intertextual comprehension process in which multiple sources of information are brought together, evaluated, and synthesized (Rouet, 2006). It involves the psychological and mental processes of individuals engaging with two or more texts and making sense of them to achieve their goals (Rouet et al., 2019). During the process of reading multiple texts, students achieve an integrated mental model by performing three fundamental integrations: intra-text integration, intertextual integration, and text-prior knowledge integration (Anmarkrud et al., 2014; List, 2021). However, not all students demonstrate the same level of integrative reasoning ability.

Writing an argumentative essay based on multiple sources is a hybrid reading and writing task frequently used in multiple-text literacy (Spivey, 1990). It can be defined as writing an argumentative essay with multiple sources, comprehensively interpreting multiple sources, developing an integrative argument based on the claims presented in these sources, and conveying it in written form (Litman et al., 2017). This task is complex; it requires students to comprehend the ideas presented in the source texts, distinguish opposing positions and

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claims in the documents, identify and evaluate supporting reasons and evidence, and present their own opinions in a written argumentative structure (Barzilai et al., 2023; Britt & Rouet, 2012). Students need to identify authors' perspectives, support their arguments with accurate and reliable sources, attribute ideas in written products to sources, integrate and synthesize information, and draw additional inferences from information obtained from multiple sources (Barzilai & Eshet-Alkalai, 2015).

Multiple-text-based argumentation requires students to read information from multiple texts on a specific topic or issue, analyze and synthesize it, and develop an argument. According to Toulmin (1958), argumentation is a collection of supported claims. The ability to critically evaluate arguments and counterarguments and integrate them into an overall conclusion is critical in writing argumentation with multiple documents (Mateos et al., 2011). Many students fail to consider both sides of the argument and integrate opposing arguments into their essays (Barzilai & Eshet-Alkalai, 2015). The Documents Model framework [DMF] assumes that text contents are encoded into source nodes with source information (Perfetti et al., 1999). Accordingly, readers encode arguments in the texts along with source characteristics such as author, publisher, and publication year, and they compare opposing arguments based on source characteristics for their credibility (Britt & Rouet, 2012). This encoding allows readers to comprehend the author's perspective and provides clues to question the reliability of the source. Research indicates that students find it challenging to perform various actions, such as determining author perspectives, assessing and interpreting the content of documents, using source information, and evaluating sources (Barzilai et al., 2015).

Variables associated with success in multiple-text tasks are frequently investigated in the literature. These studies specifically address individual differences (reading purpose, interest), behavioral engagement (text length), and process variables (strategies). Individual differences were examined in terms of topic interest and reading purpose. Reading purpose may influence readers' processing and comprehension efforts. Readers interpret reading instructions for a specific purpose, adapt their operations accordingly, and spend more time and effort on activities they think will help them achieve the goal (McCrudden & Schraw, 2007). While there is a great deal of research on the impact of reading purpose on single text comprehension (e.g., van den Broek et al., 2001), there are fewer studies in the area of multiple text comprehension. The findings of a study (Latini et al. 2019) conducted with 133 university students presented that the purpose of reading did not have a significant effect on comprehension of multiple texts. More studies should be executed to investigate the validity of this finding.

Another individual variable is topic interest. Researchers examined the effect of students' topic interest on multiple-text use and comprehension (Stang Lung et al., 2019; List et al., 2019; Strømsø et al., 2010). In their study with 233 high school seniors, Strømsø et al. (2010) found that the level of interest in climate change was associated with both intra-text and inter-text inference verification tasks, with interest contributing significantly only to the variance of inter-text inference verification ($\beta = .08$, $p < .05$). Unlike Strømsø et al. (2010), List et al. (2019), in their study, did not find a significant relationship between multiple-text performance and topic interest. There are conflicting findings in the literature regarding the relationship between subject interest and multiple-text performance. However, some studies (Bråten et al., 2014; List, 2021) indicated that topic interest indirectly affects multiple-text performance through behavioral engagement. In research with 351 university students, List (2021) found that the level of interest in the topic of trophy hunting predicted the time students spent reading multiple texts ($\beta = 0.20$, $p < .001$) and the use of self-reported strategies (deeper level strategy use) ($\beta = 0.18$, $p < .01$), but did not predict performance in sentence verification-based comprehension tasks. Conflicting findings in the literature present that different studies are needed to determine the effect of topical interest on the ability to read and write multiple texts.

Another variable related to multiple-text performance is composition length. Composition length is considered an indicator of behavioral engagement in multiple text tasks, including reading and writing time (Bråten et al., 2022; List, 2021). Previous studies (Bråten et al., 2022; Tarchi & Mason, 2020) found that students' composition length (word or sentence count) uniquely predicted their performance in multiple-text tasks (summary, synthesis, or argumentation). Bråten et al. (2022) found that the length of written products generated by students after reading 10 different texts on phobias predicted the integrated understanding of these texts ($\beta = 0.388$, $p = 0.002$) in a study with 116 undergraduate students.

Another variable that influences the quality of students' text-based argumentative compositions is the strategies they use during information processing. Strategies that require active effort on the reader's part contribute to constructing within-text and cross-text meaning, integrating texts, and monitoring one's own comprehension processes (Afflerbach & Cho, 2009). Students' use of strategies during the processing of multiple texts was investigated through self-report questionnaires (Bråten & Strømsø, 2011; Bråten et al., 2014), think-aloud protocols (Anmarkrud et al., 2014; Wolfe & Goldman, 2005), written notes generated during the use of multiple texts (Hagen et al., 2014; Kobayashi, 2009; List & Du, 2021), and compositions based on the integration of multiple texts (Gil et al., 2010; Rakovic et al., 2021; Wiley & Voss, 1999). In a significant self-report study (Bråten et al., 2014), deep-level strategies that focus on transforming information made a direct contribution ($\beta = 0.19$) to the variance in comprehension of multiple texts. A study based on think-aloud protocols (Wolfe & Goldman, 2005) found that adolescent students (ages 11–13) used paraphrase (22%), evaluation (13%), comprehension success (3%), comprehension problem (3%), and elaboration (58%) strategies to varying degrees during the process of information processing.

In a study questioning the note-taking and comprehension performance of university students while reading multiple texts, two main strategies were identified in student note-taking (Hagen et al. 2014): paraphrasing and elaboration (intra-text elaboration and inter-text elaboration). It was determined that students predominantly used paraphrasing ($M = 5.45$) in their notes, while intra-textual elaborations (linking information within the same text, $M = 3.75$) and inter-textual elaborations (linking information from different texts, $M = 0.36$) were less frequent. Correlation analysis revealed no relationship between paraphrasing and comprehension performance (intra-textual inference verification and inter-textual inference verification), but positive relationships were found between the inter-textual elaboration strategy and intra-textual inference verification, as well as inter-textual inference verification performance.

In a study examining strategies used through integrated compositions (Wiley & Voss, 1999), the textual sources of information included in undergraduate students' written responses were examined. Each sentence in the students' essays was coded as borrowing (i.e., directly taken from the texts or expressed in other words), transforming (i.e., combining two or more presented pieces of information that are not linked in the text), or adding (i.e., including a new claim or fact not present in the source texts). It was determined that most sentences in students' essays involved borrowing rather than transforming, indicating the difficulty in reformulating and integrating text-based information. Similarly, in a study by Gil et al. (2010), which compared discussion and summary writing tasks based on multiple texts, it was found that students engaged in more information transformation and used more source texts during summary writing compared to the discussion task. Another study using the same method (Rakovic et al., 2021) found that students referred to the evidence in the sources to support their arguments, and they predominantly preferred conveying information (approximately 82% of evidence-based sentences reflected information or understanding) rather than transforming information. The study revealed that information transformation was infrequent in students' writings and that there was a weak positive relationship between the information transformation coefficient and argumentative composition scores (Rakovic et al., 2021). All these studies demonstrate the impact of certain strategies used during the process of reading multiple texts on performance. However, there are also some conflicting results among the studies, which may be attributed to the different methods used to examine strategies (self-report, think-aloud, notes, and integrated compositions).

In addition to paraphrasing and transformation, the number of citations to source texts and the number of source texts used can be considered part of information processing strategies. Studies have shown that the number of source texts used and the number of citations to these texts in integrated compositions are associated with multiple-text performance (Kiili et al., 2020; List et al., 2017). List et al. (2017) found that the frequency of citations to source texts (e.g., title of the work, author's name, etc.) uniquely predicted response quality in undergraduate students' written products. Kiili et al. (2020) determined that the number of sources used and the number of idea units based on source texts were significantly correlated with argumentation success in their study with elementary school students. In contrast, Hagen et al. (2014) found no relationship between the number of source texts used in students' notes and their multiple text comprehension performance. Given the variation in findings across studies, the impact of source text use on multiple-text performance was examined in this study.

In this study, we investigated the text-based argumentative writing skills of adult Turkish students (aged between 18 and 23) who read five different sources of information on the controversial topic of global warming. To our knowledge, there is no study conducted with adult Turkish students at this level. We addressed individual differences (reading purpose, topic interest, academic achievement), process variables (strategies for writing argumentation and text length), and demographic characteristics (age, gender) that we believed to be closely related to them. In particular, in this study, we embarked on the following research questions:

- What is the level of students' text-based argumentative writing skills?
- To what extent are students' individual characteristics (purpose, topic interest, academic achievement), demographic characteristics (gender, age), and process behaviors (composition length and using strategies) related to their text-based argumentative writing skills?

2. Methodology

2.1.Research Model

In this study, which was aimed at determining the individual and process variables that influence adult students' text-based argumentative writing skills, a predictive correlational design was used (Buyukozturk et al., 2012). This design was chosen to explore the factors that predict text-based argumentative writing skills. Identifying the predictors of multiple-text-based argumentative writing quality can contribute to the analysis and improvement of individuals' reading and writing skills with multiple texts. Accordingly, individual differences (reading purpose, topic interest, academic achievement), process variables (strategies for using source texts' content and text length), and demographic characteristics (age, gender) were entered as independent variables to identify the variables that predict the dependent variable, which is multiple text-based argumentative writing skills.

2.2. Participants

Participants were 101 individuals with an average age of 19.51 who were high school graduates and located in the southeastern cities of Gaziantep and Kilis in Turkey during the 2021–2022 academic year. The participants were selected based on the principles of accessibility and voluntariness. Among the participants, 49 were attending university preparatory courses, while 51 had just started their first year in the department of Mathematics Education.

The participant group was relatively homogeneous in terms of gender (69.3% female), type of high school graduated from (52% Anatolian high school, 18.8% vocational high school, 13.9% Imam Hatip high school, 9.9% science high school, and 5% other high school graduates), high school major (61.38% focused on the sciences), and socioeconomic status (more than half had a moderate level).

2.3. Data Collection Tools and Procedure

The study data were collected in two separate classrooms under the researcher's guidance. Participants first completed a topic interest scale. Then, they read several texts according to the instructions provided. After reading, they moved on to the writing task without access to the source texts. The entire process took an average of 70 minutes to complete. The data collection tools used in the research are described below.

Topic interest. To measure students' personal interest in climate change, the topic interest scale developed by Stømsø, Bråten, and Britt (2010) was used. The scale consists of 12 items rated on a 10-point Likert scale ranging from 1 (not true for me at all) to 10 (very true for me). The scale was adapted into Turkish by the researchers. The one-dimensional scale includes items related to the level of interest in global warming and items indicating more active engagement in the topic by participants. The internal consistency and reliability of the scale were assessed using Cronbach's α based on the data from this study, yielding a value of .86.

Texts. Students read five written texts on different aspects of climate change. These texts were used by Strømsø, Bråten, and Britt (2010) and were utilized by various researchers. The texts were translated into Turkish by language experts and presented to the participants. The author, publisher, content, and word count of the texts are presented in Table 1.

Table 1. *Overview of Source Texts*

Type of text	Publisher	Author	Content	n words
1. Textbook text	Publishing house	Teachers in upper secondary	Natural greenhouse effect and the man-made greenhouse effect	274
2. Popular science article	Center for International Climate and Environmental Research	Not provided	Man-made greenhouse effect and greenhouse gases emitted into the atmosphere	219
3. Popular science article	University of Oslo	Prof. Oddbjørn Engvold	He argues that climate change is caused by astronomical causes	225
4. Newspaper article	Norway liberal daily	Gustav Jensen	Negative consequences of the greenhouse effect	278
5. Newspaper article	Norway conservative daily	John Hultgren	Positive results of the greenhouse effect	210

Text 1 provides a relatively neutral and academic explanation of the natural greenhouse effect and the man-made greenhouse effect. Text 2 focuses on the causes of the man-made greenhouse effect, specifically highlighting the contribution of human-induced emissions of greenhouse gases to the observed climate changes. In Text 3, written by an astrophysics professor, it is argued that climate change is largely driven by astronomical conditions; therefore, it is attributed to natural causes rather than human activities. Text 4 is taken from a liberal daily newspaper in Norway and describes the negative consequences of global warming as the weakening of ocean currents in the North Atlantic and melting ice in the Polar Regions. Text 5 is taken from a conservative daily newspaper in Norway and explains the positive consequences of a warmer climate in northern regions, such as the existence of a sea route covered with ice through the Northwest Passage and access to natural resources hidden beneath the Arctic ice.

Writing task. Students were assigned to write an essay discussing the ideas and claims in the texts they read about the causes and effects of climate change. For this assignment, students received two different sets of instructions. In the first set, students were asked to read five texts on global warming, each presenting different claims, for their personal reading. After reading, they were to write an argumentative essay evaluating the claims and ideas in the texts. In the second set of instructions, students were asked to read five texts on global warming, each with different claims, as if they were "taking an exam." Afterward, they were to write an argumentative essay evaluating the claims and ideas in the texts. In both cases, students were expected to critique and assess the claims in the texts, justify their own viewpoints, and use citations from the texts to support their arguments. The instructions were randomly distributed among the students. Forty-nine students wrote essays following the first set of instructions, and fifty-one followed the second. The students' essays were then analyzed in terms of text length, strategies used to integrate source materials, and the quality of the arguments presented.

Strategy use. Strategy use was examined through students' written compositions. To determine how and to what extent the information obtained from the source texts through reading was used in the students' writings, the argumentative essays were first divided into idea units, as done in similar studies. Idea units include a main verb that expresses an action, activity, or situation, along with gerunds and complements (Magliano et al., 1999). In each idea unit in the students' writings, it was determined which source or sources the students used, how they integrated and transformed the source information, what additions they made, and if any misconceptions were present, following the classifications and definitions made by Wiley and Voss (1999) and Gil et al. (2010). The number of source texts used indicates how many different source texts the information in the students' argumentative essays belongs to. Source citations indicate the number of direct and indirect references to each source's content. Explanation refers to the students' expressions of the meanings expressed in the source material in their own words without changing them. Elaboration refers to students using the information from the source material together with their previous knowledge or combining two or more pieces of information within or across texts. Intra-text integration refers to summarizing the information from one source text with an idea unit by the students, while inter-text integration refers to integrating information from other source texts. Text-prior knowledge integration refers to integrating information with prior knowledge. Addition refers to students adding their own prior knowledge or personal opinions to the argumentative

essays. Misconception refers to expressions by the students that indicate a misunderstanding of the source text.

Argumentative quality. The argument quality of the articles written by the participants was scored according to the coding system of Mateos et al. (2018). Scoring is based on the type of claim and the type of final result. 0 points for not being based on arguments presented in the source texts; 1 point for arguments from both positions that are not integrated; 2 points for supporting only one position; 3 points for integration of two positions through refutation; 4 points for minimal integration; 5 points for partial integration; 6 points for full integration.

2.4. Data Analysis

In data analysis, first the argumentative compositions written by students were evaluated. A total of 101 compositions, ranging from 80 to 438 words, were examined multiple times. In the first step, the argument quality was determined by considering the stance, synthesis, weighting, and conclusions of the compositions. In the second step, the use of source texts was examined in detail by comparing the idea units with the source texts. This section required counting the number of source texts used, text citations, explanations, elaborations, additions, and misconceptions. To do this, we determined the origin of each idea unit in the argument essay and then decided which transformation technique it underwent. The use of source texts was determined, especially considering traceable direct or indirect references and citations. Different idea units mentioned in the compositions were taken into account, while repeating idea units were excluded from frequency calculations. Sometimes irrelevant information was also present in the writings (e.g., sections that only analyzed source texts in terms of language and expression), which were recorded as additions. The researcher evaluated all the writings based on the specified criteria, including source text use and argument quality. To ensure the reliability of scoring, the first 25 papers (25%) were examined by a Turkish teacher, and the last 25 papers (25%) were examined by a graduate student. The reliability coefficient (Pearson's r) between the researcher and independent evaluators ranged from .80 to .92. Disagreements were resolved through discussions.

Paired simple t-test, Pearson correlation, and hierarchical regression analysis techniques were used in data analysis. Pearson correlation analysis was conducted to determine the relationships between variables. In this analysis, gender (0 = male, 1 = female) and reading purpose (0 = reading for pleasure, 1 = reading for exams) were coded as dummy variables. Before the regression analysis, it was investigated whether the assumptions were met. These include the absence of missing data, outliers, univariate and multivariate normal distributions, linearity, multicollinearity, and independence of residuals (Tabachnick & Fidell, 2013). The z-scores of the variables were within the range of ±3, and the measures of skewness and kurtosis were within the range of ±2 (George & Mallery, 2016). Multicollinearity was examined according to the criteria of a tolerance value greater than .01, correlation between variables less than .70, and VIF values less than 10 (Tabachnick & Fidell, 2013). Since the correlation between word and sentence counts was above .70, it was decided to use only word counts in the regression analysis. All of these examinations can be interpreted as indicating that the regression assumptions are largely met.

After ensuring the suitability of the dataset for analysis, in the first step of hierarchical regression analysis, the level of interest in the subject was included as a control variable in the model. In the second step, composition length was added, and in the final step, process variables related to the use of multiple sources were included in the model. The level of interest in the subject was used as a control variable as it was expected to affect students' efforts in the process, and text length was used as it was expected to affect the quality of the argument. All statistical analyses were performed using the IBM SPSS 26 statistical software package.

2.5. Ethical

All procedures in the study were conducted in accordance with ethical standards and approved by the Social and Human Sciences Ethics Committee of Gaziantep University.

3. Findings

Descriptive statistics for all variables are summarized in Table 2. The skewness coefficients range from -0.79 to 1.31. Since there is no significant skewness observed in the distributions of the variables, it is considered appropriate to use parametric statistical techniques in the analyses.

Table 2. *Descriptive Statistics*

Variables	Min.-Max.	M	SD	Skew
Age	18-23	19.51	1.26	0.65
Grade average	50-100	81.83	11.06	-0.72
Topic interest	0-10	7.2	1.8	-0.07
Number of words	80-438	185.82	74.91	1.19
Number of sentences	5-35	14.48	6.67	1.26
Number of resources	0-5	3.72	1.27	-0.79
Total source citations	0-21	8.71	4.31	0.28
Citations to text 1	0-8	2.64	1.87	0.67
Citations to text 2	0-5	1.43	1.25	0.46
Citations to text 3	0-4	0.82	1.85	1.31
Citations to text 4	0-7	2.00	1.52	0.90
Citations to text 5	0-6	1.81	1.37	0.58
Paraphrase	0-14	4.19	3.20	0.78
Elaboration	0-13	3.94	2.70	0.59
Elaboration intra-text	0-7	1.71	1.75	0.86
Elaboration inter-texts	0-6	1.20	1.27	1.13
Elaboration prior-know.	0-5	1.05	1.24	1.24
Addition	0-21	6.29	4.23	0.92
Misconception	0-6	1.25	1.39	1.05
Argumentation quality	0-5	1.78	1.16	0.90

As presented in Table 2, students included an average of M = 3.72 (SD = 1.27) of the five reading texts in their text-based argumentative essays and made M = 8.71 (SD = 4.31) references to these texts. They constructed an average of M = 14.48 (SD = 6.67) sentences and used M = 185.82 (SD = 74.91) words in their compositions. The average score for the quality of the multi-text-based argumentation was found to be M = 1.78 (SD = 1.16). Students made the most references to Text 1 (M = 2.64, SD = 1.87) and the least references to Text 3 (M = 0.82, SD = 1.85). The paired samples t-test results (t = 9.100, df = 100, p = 0.00, d = 0.90) indicated that the difference (M_{diff} = 1.82, SD = 2.01) between the references was statistically significant and of large effect size.

It was observed that students had a significant number of misconceptions (M = 1.25, SD = 1.39) when transforming the information from the source texts. These misconceptions were particularly related to the confusion between the concepts of global warming, climate change, and the greenhouse effect. As expected, the addition strategy (M = 6.29, SD = 4.23) was more frequently used in text-based argumentative writing. However, some of the additions were not related to argumentation and evaluation but rather focused on providing background information.

The interrelationships between variables are presented in Table 3. Contrary to expectations, there were no significant relationships between age, gender, high school GPA, reading purpose variables, and text-based argumentative writing proficiency. There were significant positive correlations between the quality of argumentation and topic interest level (r = 0.20, p = 0.036), word count (r = 0.58, p = 0.000), sentence count (r = 0.51, p = 0.000), the number of used source texts (r = 0.44, p = 0.000), the total number of references to source texts (r = 0.49, p = 0.000), integration (r = 0.27, p = 0.005), integration through in-text referencing (r = 0.40, p = 0.000), and addition strategies (r = 0.37, p = 0.000).

Table 3. *Correlations Between Variables*

Variables	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1. Gender[1]	--												
2. Age	-.17	--											
3. Grade average	.23*	-.09	--										
4.Reading purpose[2]	.11	.28**	.59**	--									
5. Topic interest	.21*	-.13	.20*	.11	--								
6. N. of words	.17	.09	.33**	.38**	.11	--							
7. N. of sentences	.22*	.10	.26**	.34**	.09	.84**	--						
8. N. of resources	.21*	-.06	.12	.23*	.13	.45**	.43**	--					
9. Source citations	.11	-.01	.09	.15	.07	.53**	.58**	.70**	--				
10. Paraphrase	-.01	.01	-.11	-.01	-.12	.33**	.48**	.41**	.75**	--			
11. Elaboration	.13	.04	.30**	.33**	.25**	.53**	.39**	.50**	.53**	-.01	--		
12. Addition	.23*	-.03	.17	.05	.13	.51**	.53**	-.00	-.05	-.15	.17	--	
13. Misconception	.01	-.15	.07	.15	.07	.05	.14	.38**	.20*	.23*	-.08	-.22*	--
14. Argumentation	.09	-.00	.18	.10	.20*	.58**	.51**	.44**	.49*	.27**	.40**	.37**	.06

Note. * p < .05, **p< .01; 0= male, 1= female; 0= reading for pleasure, 1 = reading for exams; n. = number

Lastly, the results of hierarchical regression analysis to determine significant predictors of text-based argumentation writing ability are presented in Table 4. Given the varying interest levels among students, interest was entered in Step 1. Due to differences in text length among students, word count was entered as a control variable in Step 2. In the final step, the number of used source texts, descriptions, elaboration, additions, and references to source texts, paraphrasing students' transformation skills, were entered.

Table 4. *Hierarchical Regression Analysis Predicting Text-Based Argumentation Quality*

Predictor	B	Std. Error(B)	β	p	R^2_{adj}	ΔR^2
Step 1					.034*	.044*
Topic interest	.013	.006	.209	.036		
Step 2					.343***	.313***
Number of words	.009	.001	.563	.000		
Step 3					.414***	.099**
Number of resources	.101	.102	.111	.324		
Paraphrase	-.055	.069	-.152	.424		
Elaboration	-.045	.066	-.105	.492		
Addition	.071	.028	.260	.013		
Source citations	.126	.063	.468	.047		

*p < .05; **p < .01; ***p < .001

According to Table 4, the model generated in the first step, including the interest level variable (β = 0.209, t = 1.838, p = 0.036), explains 3% of the variance. In the second step, the model created with the variable word number in the compositions explains 34% of the variance in text-based argumentation writing (F = 27.161, p = 0.000). In the third step, it was observed that by adding variables related to the strategies of using source texts to the model, approximately 41.4% of the variance in text-based argumentation writing was explained (F = 11.106, p = 0.000). It was observed that the number of resources (β = 0.111, t = 0.991, p = 0.324), paraphrasing (β = -0.15, t = -0.802, p = 0.424), and elaboration (β = -0.10, t = -0.690, p = 0.492) did not make a significant contribution to the model.

4. Conclusion and Discussion

In this study, it was aimed to examine how adult students (aged between 18 and 23) use information obtained by reading conflicting texts and how they utilize it in text-based discussions, as well as to determine the variables that influence text-based argumentation writing skills.

Firstly, regarding text-based argumentation writing, it was discovered that adult students expressed one-sided views. It was found that adult readers often did not equally present claims and counterclaims when discussing information from conflicting texts, and they demonstrated significant deficiencies in the processes of synthesizing and integrating information. It is believed that students cannot engage in high-level reasoning because they do not use some of the source texts while writing text-based arguments and focus more on telling

information rather than transforming it. The low performance observed in the text-based argumentative essay task obtained from this study is also supported by other research conducted in this field (Bråten et al., 2014; Iordanou & Constantinou, 2014; Du & List, 2020; Mateos et al., 2018; Tarchi & Mason, 2020; Tarchi & Villalón, 2021). For example, Tarchi and Villalón (2021) determined that university students exhibited low performance in writing argumentative essays based on multiple texts in their study with 73 university students.

There could be several reasons for students' low quality of text-based argumentation. Firstly, students might lack general knowledge and skills in text-based argumentative writing, including selecting evidence from texts, identifying, elaborating on, and organizing the evidence. Because a significant number of compositions were more like summaries of what was read. Moreover, a considerable number of essays presented information from source texts in a way that separated them rather than integrated them. Generating arguments from multiple sources is cognitively demanding, so some students might have avoided the cognitive load (Raković et al., 2021). The levels of motivation and commitment that students demonstrated in the writing task might also have influenced the quality of the writing. Indeed, some students might have spent more effort on reading and writing tasks.

Another reason could be that students might have encountered difficulties in constructing a cross-text model and an integrative document model. According to the DMF (Perfetti et al. 1999), students encode information from source texts by forming source-content connections during the reading process and consider these encodings during the evaluation phase in the cross-text model. Students might not have had sufficient knowledge about the sources of these texts published in Norway, which could have prevented them from forming source-content connections. Additionally, students might not have paid equal attention to all the claims in the source texts. Students made significantly more references to certain texts compared to others. The third text, which argues that climate change originates from astronomical conditions and that human pollution of the atmosphere is not the proven main cause of global warming, received considerably fewer references than the others, confirming this. Similar issues were observed in other studies (Barzilai & Eshet-Alkalai, 2015; Du & List, 2021). In the study by Barzilai and Eshet-Alkalai (2015), participants were given an argumentative writing task on the desalination of seawater based on four blog posts representing different perspectives. Participants relied on an average of only 1.7 blog posts for their arguments, indicating that they only partially took into account the existing perspectives. According to Stadtler and Bromme (2014), when students are presented with conflicting information from different sources, they may disregard the conflict in order to achieve cognitive consistency. Therefore, students might have intentionally ignored the information in the third text that did not conform to their epistemic standards, which could have negatively affected the quality of argumentation. Alternatively, the limited prior knowledge of participants regarding climate change caused by astronomical conditions may have made it challenging for them to keep these claims in mind and use them while writing arguments. All these variables might have made the text-based argumentation a challenging task in general.

Secondly, in this study, no significant relationship was found between age, gender, academic achievement (grade point average), and text-based argumentation skills. It was thought that age and academic achievement would provide domain-specific knowledge and expertise in the relevant discipline, thus affecting the quality of text-based argumentation. A study found that elementary school students had a lower likelihood of success with contradictory texts compared to university students (Salmerón et al., 2016). According to Barzilai and Strømsø (2018), although some studies on multiple-text tasks (comprehension, summarization, argumentation, etc.) reported higher scores for females in some cases and for males in others, there has been no clear advantage for either gender yet. Similarly, more research is needed to reveal the effects of age on prior knowledge and information processing in individuals of the same age group, as with the gender variable.

In this study, it was observed that exam-oriented reading was associated with the number of words, sentences, source texts used, and added units of ideas in the composition, but contrary to expectations, it was not related to the quality of argumentation. Similarly, in a study conducted by Latini et al. (2019) in the context of reading multiple complementary texts, it was found that reading for pleasure and reading for exams did not predict the integration of complementary texts. It can be said that the purpose of reading influences the effort invested but does not directly affect performance. The fact that students did not encounter enough multiple-text tasks in the education system might have an impact on this.

Thirdly, similar to previous studies, this study found a low-level and positive relationship between argumentation quality and paraphrase and elaboration (Hagen et al., 2014; Rakovic et al., 2021; Wolfe & Goldman, 2005). However, hierarchical regression analysis revealed that paraphrasing and elaboration did not predict text-based argumentation quality. Paraphrasing based on knowledge transfer may not predict argumentation quality as it involves relatively superficial interaction in a text-based context. However, it is surprising that elaboration, which is based on knowledge transformation, is not a significant predictor. In a study by Du and List (2020) that examined strategies using a typed strategy elicitation protocol, it was found that elaboration is a meaningful predictor of students' evidence use. In the mentioned study, unlike our study, the fact that the elaboration was handled only as text-pre-knowledge elaboration and the strategy analysis method was different might have caused a contradiction between the studies. Therefore, it can be said that strategy examination methods are effective in multiple-text performance.

Fourth, this study found that topic interest influenced the success of writing text-based argumentative essays. However, contrary findings exist in the literature, suggesting that personal interest in the topic does not predict multiple-text performance (Bråten et al., 2014; List, 2021; Salmerón et al., 2018). List (2021) found in their study with university students that personal interest in the topic did not directly predict comprehension of multiple texts, but situational interest had an impact on multiple-text performance. Despite the contrasting findings regarding individual interest level and multiple-text performance, some studies (Bråten et al., 2014; List, 2021) indicated that topic interest may indirectly affect the comprehension of multiple texts through behavioral engagement (e.g., time spent reading, writing time, etc.). Therefore, it can be said that topic interest can be an individual variable that yields different results from study to study and can directly or indirectly contribute to multiple-text task performance (Bråten et al., 2014).

Finally, topic interest level, word number, citation number, and addition number significantly predicted text-based argumentation writing proficiency, accounting for approximately 41% of the variance when all variables were considered together. It was observed that differences in interest level, word number, citation number, and addition number contributed significantly to the variation in students' text-based argumentation writing success. Composition length is also an important predictor of comprehension of multiple texts and argumentative essay writing in similar studies. Similar studies conducted in the field confirmed this finding (Bråten et al., 2018; Latini et al., 2019; Tarchi & Mason, 2020). In addition, referring to the content of source texts positively affects the quality of argumentation. Reflecting the existing source information during the evaluation process of source texts contributed to the formation of integrated mental representations. Similarly, additions made by students based on their prior knowledge contribute positively to the evaluation process of texts and thus to the quality of argumentation.

In summary, this study found that students' skills in writing argumentative essays based on multiple texts were generally weak. The finding that most students, regardless of age, gender, GPA, or reading purpose, struggled with argumentative writing suggests a gap in education. Another noteworthy result was that students relied heavily on some source texts while barely using others in their multi-text-based argumentative essays. Identifying the factors behind this uneven use of sources may help clarify the process of writing text-based argumentative essays. Although the number of sources, paraphrasing, and elaboration did not significantly contribute to the final model, these variables are thought to have an indirect effect through essay length. Further detailed studies on this topic could provide valuable insights.

5. Limitations and Recommendations

There are several significant limitations of this study. Firstly, the sample for this study is relatively small and heterogeneous, which may limit the representativeness and generalizability of these findings to other demographics. Finding an adequate number of volunteer participants can be challenging due to the lengthy data collection process in multiple-text research. Those who are found may also contribute to relative heterogeneity, as seen in the gender distribution in this study. Replicating the research with larger sample groups would be beneficial. Secondly, this study only quantitatively addressed the strategies for using the content of source texts. Future research could consider the qualitative aspects of source text utilization. Another limitation could be the potential cultural differences resulting from the selected translated texts and the limited knowledge of Turkish students about the sources of these texts.

Future research could replicate the study with more current topics and texts written in students' native languages.In general, the findings indicated that students were not sufficiently successful in the multiple-text-based argumentative writing task. Demographic variables (gender, age) and certain individual variables (academic achievement, reading purpose) mostly influence effort (text length), while process variables (citation number, additions, composition length) directly impact performance. Most importantly, the educational processes should provide sufficient emphasis on argumentative composition writing. Furthermore, awareness can be raised among students regarding additions, citations, and text length, which positively contribute to the writing process based on multiple sources of information. Training programs can be provided to enhance students' skills in transforming and utilizing information from source texts.

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