An Analysis of the Relationship between Primary School Fourth-Grade Students' Writing Performance, and Student and Class Variables

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Abstract

This study aims to examine the writing performance of primary school fourth-grade students in relation to the student-level variables (writing, reading comprehension, self-regulation-based writing, writing motivation, and writing anxiety) and classroom-level (teacher) variables (knowledge of text-writing instruction and text-writing instruction self-efficacy beliefs). The data were collected from Zonguldak, Turkey in 2019-2020 academic year. The study used a correlation research method consisting of 734 fourth-grade students at primary school and 31 classroom teachers. The data collection tools included the Story Text and Informative Text Assessment Analytical Rubric, Writing Achievement Test, Reading Comprehension Test, Self-Regulation-Based Writing Scale, Writing Motivation Scale, Writing Anxiety Scale, and Text-Writing Instruction Form for Classroom Teachers, and Text-Writing Instruction Self-Efficacy Beliefs Scale. A two-level Hierarchical Linear Modelling (HLM) analysis was performed on the data. The results showed that students' writing knowledge, reading comprehension level, and self-regulation-based writing skills play a significant role in their writing performance. The student-level variables examined in this study account for the text-writing performance of students by 24%. The study presents the results based on the findings and recommendations based on the results.

Keywords: Writing skill, Primary school fourth-grade students, Classroom teachers, Hierarchical linear modeling

Introduction

Since writing is a tool for learning and communication that is acquired and developed during school years, it is essential to provide early opportunities for its improvement so that it can be utilized effectively throughout one's life. As writing requires many cognitive, affective, and psychomotor skills (Graham, 2006; Zimmerman & Risemberg, 1997), it is, however, quite a complex and difficult task (Graham & Harris, 2009; Graham et al., 2018; Graham et al., 2019). Therefore, a formal education is needed to acquire and develop writing skills.

The beginning of education life is the first and most important stage, where writing and written expression skills can be acquired. Still, it is not enough to gain writing skills alone to effectively use written expression skills. Writing and written expression skills are likely to be affected not only by student-related factors but also by teachers, who constitute an important part of the process. In this regard, this study has aimed to examine the impact of factors originating from students and teachers on text-writing skills.

Theoretical Framework

Factors Affecting the Writing Skill

'Knowledge' has played a central role in almost every major writing model proposed for the last half century (Saddler & Graham, 2007). The studies on writing knowledge (Benton et al., 1995; Fitzgerald & Markham, 1987; Gillespie et al., 2013; Graham et al., 1993; Graham et al., 2005; Graham, 2006; Graham et al., 2007; Lin et al., 2007; McQuitty, 2011; Olinghouse & Graham, 2009; Saddler & Graham, 2007; Zumbrunn, 2010; Zumbrunn & Bruning, 2013), seem to deal with it in the context of instructions about how to write, as well as linguistic

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[*] This study was derived from the first author's doctoral thesis.
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knowledge, relevant information about writing topics, text types, and their structures, and metacognitive knowledge about writing processes.

Individuals with advanced writing skills appear to have a high level of knowledge about the basic elements required to produce quality texts and their characteristics (Harris et al., 2010). Research has shown that more skilled writers prove more well-informed about writing than their peers are (Graham et al., 1993), students' writing knowledge improves within the developmental process (Graham, 2006; Saddler & Graham, 2007), and it significantly affects the writing performance (Olinghouse & Graham, 2009) and can be improved with practices such as writing instructions based on self-regulation (Harris et al., 2006).

Writing successful texts is closely related to certain variables in a learning environment, such as some skills of the writer/child and the qualifications of teachers in addition to the knowledge of basic writing and language skills (MacArthur & Philippakos, 2013). Despite showing different characteristics in terms of their uses and consequences, reading and writing skills have a common basis, such as written language and cognitive skills, both of which have a constructive effect on building meaning, indicating that these two skills are very deeply interconnected (Alves et al., 2020; Graham, 2020; Tompkins, 2018). In this regard, it is possible to claim that a child's writing success is related to his/her reading comprehension skill.

A writer's ability to organize the writing process and his/her self-regulation skills are other personal variables with an impact on writing success. It is, therefore, often recommended to teach metacognitive skills (Kaya & Ateş, 2016) and self-regulation strategies to improve writing skills (Boekaerts & Corno, 2005; Hammann, 2005; Zimmerman, 2008; Zimmerman & Risemberg, 1997). Researchers (Graham & Harris, 2000; Harris et al., 2010; Zimmerman & Martinez-Pons, 1986; Zimmerman & Risemberg, 1997) state that the strategies used by successful writers in the writing process include focusing attention, organizing the environment, mental design, cognitive strategies, goal setting and planning, organizing/transforming, searching for information, seeking outreach, self-monitoring, and self-assessment. In the process of self-regulation-based text-writing, skilled writers benefit from strategies for managing complex processes of planning, drafting, evaluation, and proofreading (MacArthur & Philippakos, 2013; MacArthur et al., 2015; Nami et al., 2012), and perform specific writing tasks (Harris et al., 2002).

MacArthur et al. (2015) stated that besides self-regulation, writing requires a high level of motivation. Bruning and Horn (2000) noted that as students improve their writing skills and learn about the writing process, they are closer to experiencing writing achievement, which may be effective in increasing students' writing motivation. Motivation, which is very important in the development of writing, especially in starting and completing it, and comprises of many components such as self-efficacy beliefs, interest, attitude, goal-orientation, success, and failure (Troia et al., 2013), denotes an individual's internal drive or progress towards a goal (McLeod, 1987).

Another factor affecting the writing skill is 'anxiety'. Writing anxiety is the state of anxiety or fear towards writing when faced with a writing task (Fisher, 2017). Students who have difficulty putting their thoughts on paper consider the act of writing a feared and disturbing task (Daly, 1985). All writers have a certain amount of anxiety, which is indeed necessary, yet for some, it can be devastating (Daly & Miller, 1975). According to McLeod (1987), this feeling can be turned into a positive effect.

The necessity of students to develop the ability to express themselves in writing has increased the emphasis on teaching how to write (Berrier, 2009). Since writing is a difficult and complex skill (Graham & Harris, 2009; Graham et al., 2012; Graham et al., 2019; Lunenburg & Lunenburg, 2014), teachers should devote their time to writing activities every day in order to instruct their students on how to use writing processes for different purposes, as well as teaching how to spell, write regular sentences and fluently, and to motivate their students to develop their writing skills (Graham et al., 2012). Another factor affecting the writing skill can be indicated as 'teachers.'

Teachers play an active role in training students, providing support, giving feedback, and modeling writing practices (Hodges, 2015). They can help students to become effective writers by teaching various strategies for each component of the writing process, such as planning, drafting, reviewing, and editing, and by supporting students until they can apply these strategies independently (Tracy et al., 2009; Zumbrunn, 2010). Still, this teaching and support alone is not enough. Teachers should be aware of their perceptions of writing and know how this affects their instruction (Thornton, 2010). At this point, it is possible to argue that teachers' knowledge and beliefs about writing will definitely influence students' writing skills, based on the 'Peter Effect' by Applegate and Applegate (2004).

Teachers' beliefs are directly related to their practices and have an impact on students' educational lives (Gaitas & Martins, 2015). Therefore, it is necessary to determine teachers' beliefs about their ability to teach their students to write texts effectively (Bañales et al., 2020). However, teachers' true beliefs about writing instruction have been largely ignored by researchers (Graham et al., 2002). Further research is, therefore, needed to examine whether teachers' writing practices are directly linked to students' writing performance (Bañales et al., 2020).

In the literature, a restricted number of studies (Brunstein & Glaser, 2011; Deniz, 2017; Kim, 2019; Kim & Schatschneider, 2017; Limpo & Alves, 2013) that examine the multiple factors affecting writing skill and modeling the relationship between these factors generally focus on the relationships among the cognitive dimensions of writing, the language skills besides cognitive skills (Kim, 2019), and psychomotor skills (Yıldız & Yekeler, 2017). In only one study (Limpo & Alves, 2013), a component related to motivation (self-efficacy), which is from among affective dimensions, was also included in addition to the cognitive dimension. Another study (Baştuğ, 2015) examined only the relationship between attitude, tendency, and writer's block, which are among the affective dimensions of writing. Although its importance is frequently emphasized in writing studies, students' emotional orientation towards writing has received little attention from researchers (Piazza & Siebert, 2008). Most of the studies on modeling writing skills were conducted with students above the primary school level.

It is essential that students get a good start on writing, a skill they will use throughout their lives. In the literature, the writing skill is generally examined in small groups on a single level, mostly at the student level, and studies on the teacher factor are limited. This study aims to make more realistic predictions about writing performance by considering student and teacher factors together. Therefore, a framework was created to observe the effects of different factors on students' writing skills and to better understand the relationship between students' writing achievement and student and classroom (teacher) characteristics. Figure 1 presents the levels and variables included in this framework.
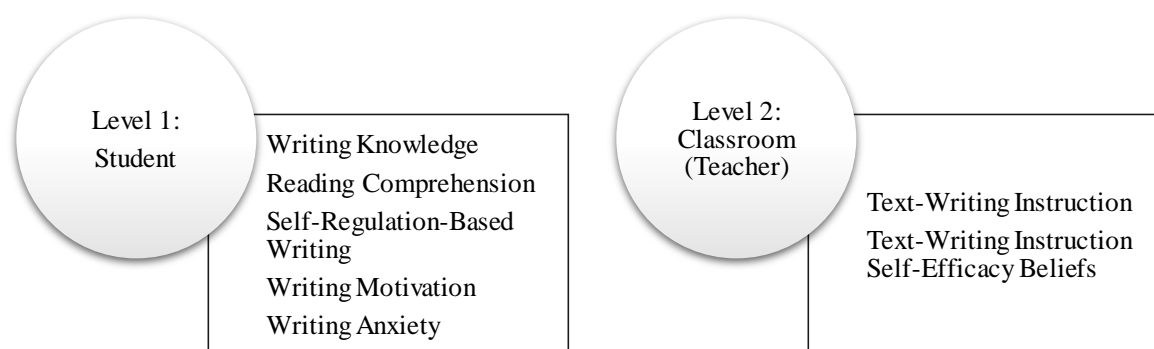

Figure 1. Levels and variables examined in the research

This study aimed to investigate the relationship between the text-writing skills of the primary school fourth-grade students and the *student-level* (level 1) and *classroom (teacher)-level* (level 2) variables. To this end, answers were sought to the following questions:

1. What are students' text-writing skills, writing knowledge, reading comprehension, self-regulation-based writing, writing motivation, writing anxiety, and teachers' knowledge of text-writing instruction and text-writing instruction self-efficacy beliefs?
2. Are the variables of students' writing knowledge, reading comprehension, self-regulation-based writing, writing motivation, and writing anxiety significant predictors of students' level of text-writing skills?
3. Are the variables of teachers' knowledge of text-writing instruction and text-writing instruction self-efficacy beliefs significant predictors of students' level of text-writing skills?

The fact that there is no other study in the literature in which student and teacher characteristics affect students' writing performance with a modeling study has been an important factor in conducting this study. For this reason, the study focused on revealing the relationship between dependent and independent variables whose effects on writing performance were examined within the framework of a hierarchical linear model and on offering suggestions for improving writing performance at the primary school level.

This study is expected to provide significant contributions to the study field in eliminating the gaps mentioned above in the literature and is considered important in terms of revealing to what extent the writing performance is related to student and class level characteristics through the Hierarchical Linear Modelling (HLM) analysis conducted on the text-writing skills of primary school fourth-grade students.

Method

Research Design

This study used the correlational research method to examine the relationship between student and classroom-level variables and students' text-writing performance. The main purpose of correlational research is to clarify our understanding of important phenomena by identifying relationships between variables (Fraenkel et al., 2011).

Participants

The data has a two-level hierarchical structure as students and teachers. A multi-stage sampling method was adopted within the scope of a two-level linear modeling approach. First, the maximum diversity sampling method was used to determine the schools. Much attention was paid to the number of fourth-grades in schools and the existence of students from different socio-economic levels (SEL) while determining the schools to collect data. In the second stage, the criterion sampling method was used to determine the classes in the selected schools, and the size of the classes was considered. Data were collected from 31 classroom teachers working in 10 primary schools in Zonguldak, Turkey, and a total of 734 fourth-grade students studying in those teachers' classes.

Measurement Tools

Assessment of Text-Writing Skill

The participants were made to write stories and informative texts to determine their performance in writing skills. The texts were then assessed with rubrics developed by the researchers.

Writing Knowledge Test

The test developed by the researchers to determine students' writing knowledge includes 28 questions and consists of questions regarding the Knowledge of Writing Genres (Text Types and Characteristics), Knowledge of Writing Processes (Encountering Difficulties in Writing), Knowledge of Writing Strategies (Characteristics of Good and Weak Writers), and General Grammar Knowledge (Punctuation, Spelling, etc.). The KR-20 internal consistency coefficient of the Writing Knowledge Test is 0.86.

Reading Comprehension Test

The researchers developed a text-based 'Reading Comprehension Test' for story and informative text types to measure the students' reading comprehension capacity. Both texts were arranged according to the Maze Technique, which is one of the Cloze Test methods. Every eighth word was omitted in the texts starting from the second sentence onwards. There were 25 blanks in each test. The KR-20 internal consistency coefficient for the informative text type is 0.84; the KR-20 internal consistency coefficient for the story text type is 0.91.

Self-Regulation-Based Writing Scale

The researchers developed the 'Self-Regulation-Based Writing Scale' to determine the extent to which students use self-regulation-based writing strategies. The five-point Likert-type scale consisted of 21 items. The Crα value of the scale consisting of a single factor was .89.

Writing Motivation Scale

The 'Writing Motivation Scale', developed by Öztürk (2013), was used in the study with the permission of the researcher to determine the writing motivation of fourth-grade students. The five-point Likert-type scale consisted of 22 items. The Crα of the five-factor scale was .81.

Writing Anxiety Scale

The 'Writing Anxiety Scale', developed by Katrancı and Temel (2018), was used with the permission of the researchers to determine the writing anxiety levels of fourth-grade students. The three-point Likert-type scale consisted of 20 items. The Crα of the four-factor scale was .91.

Text-Writing Instruction Form

'The Text-Writing Instruction Form' prepared by the researchers was used to determine the extent of knowledge of text-writing instruction of classroom teachers. There are 15 questions in the form consisting of the attributes such as the time devoted to writing studies, teaching writing processes, text types and content information, writing assessment/feedback, and writing strategies/exercises for students with weak writing skills.

Text-Writing Instruction Self-Efficacy Beliefs Scale

'The Text-Writing Instruction Self-Efficacy Beliefs Scale' developed by the researchers was used to determine the self-efficacy beliefs of classroom teachers for teaching how to write texts. Based on Bandura's (2006) classification, there are 28 items in the scale consisting of levels ranging from 0 (I cannot do it at all) to 100 (I can do it very well). The Crα value of the scale consisting of a single factor was .97.

Procedure

The data were collected from Zonguldak, Turkey, in the 2019-2020 academic year. Measurement tools were administered to the participants every other week, and the data collection process lasted six weeks. During the data collection process, the conditions that could affect the results' reliability such as the participants' interaction with each other and getting help from different sources, were prevented. Much attention was paid to administering the measurement tools during different course hours and at the beginning of each course hour.

Data Analysis

It is deemed more appropriate to use multi-level models in the statistical analysis of data with a hierarchical or clustered structure (Moerbeek et al., 2003). HLM analysis was conducted to determine the effect of student and teacher variables on the text-writing performance of fourth-grade students. The HLM clearly describes the multi-level data structures of clustered data. Regression coefficients could, thus, be calculated impartially (Raudenbush & Bryk, 2002).

The texts written by students and the form used to measure the classroom teachers' ability for text-writing instruction were scored by three different raters. Inter-rater reliability was examined to determine the consistency between raters. The Krippendorff alpha (α) coefficient was used to determine inter-rater reliability. In the evaluation of this coefficient, α <0.67 was considered a weak fit, 0.67 α <0.80 moderate fit, and α=0.80 high fit (Krippendorff, 1995).

The Krippendorff α coefficient calculated for the three raters of the texts written by the students is 0.95, indicating that there is a high agreement among the raters. The Krippendorff α coefficient calculated for the Text-Writing Instruction Form is 0.90, showing that the scores given by the three raters are consistent.

Results and Discussion

The first research question of the study aimed to analyse the descriptive statistics on the levels of students' Text-writing skill (TWS), Reading comprehension (RC), Self-regulation-based writing (SRBW), Writing knowledge (WK), Writing anxiety (WA), and Writing motivation (WM). Table 1 presents the results of the descriptive statistics.

Table 1. Descriptive statistics on student characteristics

	TWS	RC	SRBW	WK	WA	WM
N	734	734	734	734	734	734
Mean	28,23	34,14	87,63	17,88	32,27	85,29
Standard Deviation	6,30	8,58	10,73	5,37	6,46	11,99
Skewness	-0,20	-0,63	-1,00	-0,25	0,33	-0,90
Kurtosis	-0,40	-0,26	2,22	-0,58	-0,20	1,66
Minimum	8	9	21	4	20	25
Maximum	44	49	105	28	54	110
Range	36	40	84	24	34	85

Table 1 shows that the mean score of students in *TWS* is 28.23. Although the skewness value of the score distribution is negative, it is very close to zero. Consequently, it can be inferred that students' text-writing skill is generally at a moderate level. The mean score of RC is 34.14, indicating that students' reading comprehension is generally at a high level. The mean of SRBW is 87.63, and the value of skewness (-1.00) indicates that students' writing skills based on self-regulation are at a high level. The mean score of WK tests is 17.88. The skewness value (-0.25) is negative, yet not far from zero, implying that although there are students with high writing knowledge, students' writing knowledge is generally at a moderate level. The mean score in the *WM* is 85.29, showing that students' writing motivation is generally high. The mean score in the *WA* is 32.27. A positive skewness value (0.33) indicates that writing anxiety is generally low.

Table 2 presents the results of descriptive statistics related to the level of Teachers' Knowledge of Text-Writing Instruction (KTWI) and Text-Writing Instruction Self-Efficacy Beliefs (TWISEB).

Table 2. Descriptive statistics on teachers' characteristics

	KTWI	TWISEB
N	31	31
Mean	44,52	89,38
Standard Deviation	6,59	8,17
Skewness	0,25	-0,62
Kurtosis	-0,56	-0,59
Minimum	33	70,71
Maximum	59	99,11
Range	26	28,39

As seen in Table 2, the mean score of teachers for their KTWI is 44.52. The value for skewness (0.25), although positive, is close to zero, indicating that teachers' knowledge of writing instruction is generally at a moderate level. The mean score in TWISEB is 89.38. The skewness value (-0.62) shows that teachers' self-efficacy beliefs in text-writing instruction are generally at a high level.

The two-level HLM analysis method was used to determine student and teacher characteristics that significantly predicted students' text-writing skills. Three different HLMs (one-way ANOVA with random effects, random coefficient regression model, and regression with means-as-outcomes) were tested to answer the research questions.

One-way ANOVA with random effects was used to examine whether there was a difference in text-writing skills among the 31 classes involved in the study. Table 3 presents the results regarding the fixed effects in this model, and Table 4 presents those regarding the random effects.

Table 3. Fixed effects of the one-way ANOVA with random effects

Fixed Effect	Coefficient	Standard Error	t	p
General Mean Score in the Writing Skill, γ_{00}	28.07	0.57	49.38	0.00

As seen in Table 3, the general mean score of students in text-writing skills was estimated at 28.07, the standard error of which is 0.57. The following confidence interval formula was used to determine among which values the students' general mean score in writing skills was at a 95% confidence interval.

$$\hat{\gamma}_{00} \pm (1{,}96).SH = 28{,}07 \pm (1{,}96).(0{,}57) = (26{,}95, 29{,}19)$$

According to this formula, the actual value of the general mean score of students in writing skills is between 26.95 and 29.19 with 95% probability.

Table 4. Random effects of the one-way ANOVA with random effects

Random Effect	Standard Deviation	Variance
Classroom-level, u_{0j}	2.94	8.65
Student-level, r_{ij}	5.59	31.28

As seen in Table 4, the intraclass variance (σ^2) is 31.28, and the interclass variance (τ_{00}) is 8.65. The intraclass correlation coefficient (ICC) was calculated to determine the contribution of class and student-level variables to the variance in students' text-writing skills. The variance between classes was divided by the total variance to calculate the intraclass correlation coefficient. The intraclass correlation coefficient revealed that classroom-level variables accounted for 22% of the variance in the text-writing skill of students, while student-level variables accounted for 78%.

$$\text{Variance ratio for classroom-level: } \rho_{sınıf} = \tau_{00}/(\tau_{00} + \sigma^2)$$
$$= 8.65/(8.65+31.28) = 0.22$$

A random coefficient regression model was created to answer the second research question and determine the student-level variables that significantly predicted students' text-writing skill. The model included only the student-level predictive variables such as *RC*, *SRBW*, *WK*, *WA*, and *WM*.

Table 5 shows the fixed effects in the random coefficient regression model created to determine student characteristics that predict students' text-writing skills.

Table 5. Fixed effects of the random coefficient regression model

Fixed Effect	Coefficient	Standard Error	t	p
General mean of writing skill, γ_{00}	28.07	0.57	49.22	<0.001
Reading comprehension, γ_{10}	0.16	0.03	4.74	<0.001
Self-regulation-based writing, γ_{20}	0.06	0.02	2.5	0.013*
Writing knowledge, γ_{30}	0.23	0.05	4.21	<0.001
Writing anxiety, γ_{40}	-0.04	0.03	-1.19	0.24
Writing motivation, γ_{50}	0.03	0.02	1.53	0.13

As seen in Table 5, student characteristics that significantly predict students' text-writing skills include reading comprehension skills, self-regulation-based writing skills, and writing knowledge.

Reading comprehension (γ_{10} = 0.16, p<0.001) has a positive and significant relationship with text-writing skills, indicating that students with high reading comprehension skills are also more likely to have high text-writing skills. A positive relationship was observed between self-regulation-based writing (γ_{20} = 0.06, p = 0.013) and text-writing skills, signifying that students with high self-regulated writing skills have higher text-writing skills. Similarly, there is a positive correlation between writing knowledge (γ_{30} = 0.23, p<0.001) and text-writing skills.

Table 6 presents the random effects in the random coefficient regression model, which were examined to determine how much the student-level (Level 1) variables explained the variance in text-writing skill.

Table 6. Random effects of the random coefficient regression model

Random Effects	Standard Deviation	Variance
Classroom-level, u_{0j}	3.005	9.03
Student-level, r_{ij}	4.888	23.89

The study compared the variances obtained in the random effect one-way ANOVA, which is the empty model, and those in the random coefficient regression model containing only student-level predictive variables to determine the variance explained by the student-level variables in the study. As seen in Table 6, the student-level variance in the random coefficient regression model is equal to 23.89. In the one-way ANOVA with random effects, the student-level variance is 31.28 (see Table 4). According to this:

Level-1 explained variance ratio is equal to = $\frac{31.28-23.89}{31.28}$ = 0.24. The student-level variables explain 24% of the intraclass variance in students' text-writing skills.

Regression with means-as-outcomes was created to answer the third research question and determine teacher characteristics that significantly predicted students' text-writing skills. This model included only classroom-level predictive variables, such as teachers' *KTWI* and *TWISEB*.

Table 7 presents the results regarding the fixed effects in the regression with the means-as-outcomes model, which was created to determine the teacher characteristics that predicted students' text-writing skills.

Table 7. Fixed effects of regression with means-as-outcomes model

Fixed Effect	Coefficient	Standard Error	t	P
General mean of writing skill, γ_{00}	26.215	6.878	3.811	<0.001
KTWI, γ_{01}	0.044	0.098	0.450	0.656
TWISEB, γ_{02}	-0.001	0.077	-0.016	0.988

As seen in Table 7, teachers' knowledge of text-writing instruction is not a classroom-level variable that significantly predicts students' ability to write texts ($_{\gamma_{01}}$ = 0.044, p = 0.656). Similarly, teachers' relevant self-efficacy beliefs do not significantly predict students' ability to write texts ($_{\gamma_{01}}$ = -0.001, p = 0.988). Consequently, no significant relationship was observed between teachers' knowledge of text-writing instruction, their self-efficacy beliefs, and students' text-writing skills.

Table 8 presents the random effects showing the variance components in the regression with means-as-outcomes.

Table 8. Random effects of regression with means-as-outcomes model

Random Effect	Standard Deviation	Variance
Classroom-level, u_{0j}	3.05	9.29
Student-level, r_{ij}	5.59	31.28

Since the teachers' knowledge of text-writing instruction and text-writing instruction self-efficacy beliefs did not significantly predict students' ability to write texts, no comment was made on the explained variance.

Conclusion

In the first research question, the data analysis revealed that students are at quite a good level in reading comprehension. The reading comprehension test prepared according to the maze technique developed by Ulusoy (2008) indicated that the students are at the level of independent reading comprehension.

Students stated that they made use of self-regulation skills in the writing process with a high level of motivation for writing. Takımcıgil-Özcan (2014) reported that students' levels were above the mean score according to the writing motivation scale.

Students' achievement in text-writing and writing knowledge is generally at a moderate level. Although students appear at a high level in terms of self-regulation and motivation, they are at a moderate level in terms of writing knowledge. Saddler and Graham (2007) stated that the level of knowledge of talented writers is higher than that of less talented ones, and individual differences in knowledge are reflected in writing performance.

The students' writing anxiety was generally found low in the study. It can, therefore, be assumed that the students do not have a level of anxiety to negatively affect their writing or cause them to avoid writing, which seems to overlap with the findings about writing motivation. Some research in the literature also reported that the writing anxiety level of students is low (Karakoç-Öztürk, 2012; Tekşan, 2012).

One of the variables examined at the classroom level is teachers' knowledge of text-writing instruction. The scores for this variable were generally found at a moderate level. The responses of the teachers about the knowledge of text-writing instruction led to moderate scores from the following dimensions: 'time devoted for writing activities', 'text types and content knowledge', 'writing assessment/feedback', and 'writing strategies/activities for students with poor writing skills.' Nevertheless, they got slightly higher scores than the mean scores from the dimension of 'writing instruction processes.' It is obvious that although classroom teachers are partially knowledgeable about writing processes, this knowledge level is insufficient for students to perform process-based writing activities and produce qualified texts. It can, therefore, be noted that teachers' knowledge of writing processes should be improved. It was, thus, concluded that classroom teachers need to spend more time on writing activities, enhance their knowledge of text types and content, evaluate the texts effectively (for content rather than formal features) and give more feedback, acquire more information on the use of writing strategies and on the kind of activities to benefit from for students with poor writing skills.

Various studies conducted on writing instruction reported that most teachers spend very little time writing or on writing instruction (Gilbert & Graham, 2010; Kiuhara et al., 2009; Veiga-Simão et al., 2016) or rarely encourage students to use self-regulation skills in the writing process (Kiuhara et al., 2009; Veiga-Simão et al., 2016) and that a great many teachers do little or no work for students who have difficulty writing (Graham et al., 2008) or hardly ever include important types such persuasive, informative, and descriptive writing (Gilbert & Graham, 2010). The literature also shows that teachers' knowledge of writing instruction differs from the kind of activities they use in the classroom.

The classroom teachers' text-writing instruction self-efficacy beliefs were generally found to be high. In the literature, while some studies (Berrier, 2009; Mohtar et al., 2017) reported similar results on this variable, others (Graham et al., 2001) indicated that teachers' self-efficacy beliefs in writing instruction are at a moderate level. As a result, though the classroom teachers' knowledge of text-writing instruction is moderate, they appear to believe that they teach it well. Despite this, it is impossible to assert that this situation is reflected on the classroom environment adequately when both the teachers' knowledge levels and the students' writing performance are considered.

The second research question, the data revealed that the students' characteristics significantly predicting their text-writing skills include writing knowledge, reading comprehension, and self-regulation-based writing skills, and that there is a positive relationship between these factors and text-writing skills. Hence, it can be concluded that students will write more successful texts if their writing knowledge, reading comprehension, and self-regulation-based writing skills improve.

In this sense, it is likely that students' writing knowledge level has a predictive effect on writing achievement. The literature has shown that there is a positive relationship between writing knowledge and writing achievement (Gillespie et al., 2013; Graham et al., 2019; Kim, 2019; Lin et al., 2007; Olinghouse & Graham, 2009; Saddler & Graham, 2007).

Another result indicates a positive correlation between *reading comprehension level* and *writing achievement.* Reading comprehension skill appears to have an important role in developing writing achievement. As the reading comprehension level of the students increases, they will be more likely to write successful texts. Some studies in the relevant literature support a similar result (Deniz, 2017; Jouhar & Rupley, 2020; Koons, 2008; Yıldız et al., 2020). In this regard, students' reading comprehension levels should be improved so that they will be able to write more qualified texts.

The present study identified a positive relationship between *self-regulation-based writing skills* and *writing achievement.* It can, thus, be considered that self-regulation-based writing skills have an important role in the development of writing achievement. It is also expected that as students' level of using self-regulation-based skills in the writing process increases, so will their success in text writing. There are studies in the literature supporting the result that as students' self-regulation skills develop, their writing skills will develop accordingly (Englert et al., 1988; Graham & Harris, 2000; Harris et al., 2006; Limpo & Alves, 2013; Yıldız & Yekeler, 2017; Zimmerman & Bandura, 1994).

No significant relationship was found between students' *writing motivation, writing anxiety, and* writing skills. Motivation and anxiety levels alone do not seem sufficient to influence writing achievement, and such factors need to be supported with the development of writing knowledge, reading comprehension, and self-regulation skills. However, some studies in the literature report a positive relationship between writing motivation and writing achievement (Graham et al., 2017; Graham et al., 2019; Troia et al., 2013). As a common aspect in those studies, the following detail draws attention: Students with writing difficulties and inadequate writing skills were included as participants in those studies, and no evaluation was made to identify students with such characteristics. In this study, however, the students with learning, writing, or reading difficulties were identified and excluded.

The difference between *writing motivation* and *writing achievement* can be explained by the fact that the students in the study group differ from those in other studies in terms of learning, writing, or reading difficulties. Relevant studies have generally focused on a specific text type (story and persuasive text) (Graham et al., 2017; Graham et al., 2019; Takımcıgil-Özcan, 2014; Troia et al., 2013), worked with students at different grades (Graham et al., 2019; Troia et al., 2013), and been conducted in different countries (Graham et al., 2017; Graham et al., 2019; Troia et al., 2013), so the participants in this study and others have been raised in different cultures and educated according to different education programs, all accounting for the difference in results.

No positive relationship was observed between *writing anxiety* and *writing achievement.* Various studies in the literature support this result (Choi, 2013; Pajares & Margaret, 1994; Temel, 2018). The absence of a relationship between text-writing skill and writing anxiety may be due to students' relatively low level of general writing anxiety. When anxiety is very low or too low, it can negatively affect performance on a task being worked on.

The student-level variables examined in the second research question explained students' text-writing skills by 24%, which is remarkable in that the study reveals approximately a quarter of the student-level variables that explain the text-writing skill. According to this result, it can be asserted that studies should be conducted to determine other variables that affect the text-writing skill.

The third and last research question examined whether teachers' knowledge of text-writing instruction and text-writing instruction self-efficacy beliefs are significant predictors on students' text-writing skills. However, these variables were not found to significantly predict students' writing skills.
The present study is the first known study to statistically examine the impact of teachers' knowledge of text-writing instruction on students' text-writing achievement. In the literature, Bañales et al. (2020), having slightly similar aims to particular purpose of this study, reported that writing education does not make a unique, positive, or statistically significant contribution to the prediction of students' writing practices. They also pointed out that additional research is needed to examine whether the practices said to be done by teachers are related to students' writing performance. This is due to the fact that despite employing writing practices, a teacher may use them ineffectively and incorrectly. For this reason, the extent of effectiveness of the studies may vary depending on the writing activities of the teachers. Similarly, as long as teachers do not use their knowledge of text-writing instruction effectively in the teaching process, such education should not be expected to contribute to the text-writing skills of the students.

This study is one of the restricted numbers of studies examining the effect of teachers' text-writing instruction self-efficacy beliefs on students' text-writing achievement. A study similar to this research conducted by Berrier (2009) with fourth-grade teachers reported quite a low relationship between teachers' text-writing instruction self-efficacy beliefs and students' writing performance. The results showed that teachers' text-writing instruction self-efficacy beliefs do not directly influence students' writing achievement. In like manner, this study determined that despite being high, teachers' self-efficacy beliefs did not significantly affect students' writing performance. On the other hand, Brindle et al. (2016) found that despite stating that they included various writing practices in their classrooms, the teachers were found to rarely apply them. For this reason, teachers' high level of text-writing instruction self-efficacy beliefs should not be interpreted as that they will act in line with this belief in the classroom environment and that their reflection on students' writing achievement will be high.

It is clearly evident that additional research is required to investigate the connections between the text-writing instruction self-efficacy beliefs of classroom teachers and the writing instruction methods that they implement for their students, as well as the success of the students' writing. Although it was determined that teachers' knowledge of text-writing instruction and their self-efficacy beliefs did not significantly mediate the development of students' text-writing skills, the results of this study showed that 22% of the variance in students' text-writing skill was explained by classroom-level variables and 78% by student-level variables. This finding shows that teachers are also influential in developing writing skills. Despite the existence of a teacher effect of 22%, it appears that the development of writing skills is mostly (78%) due to the student-level variables. Accordingly, it can be assumed that teacher effect alone is not enough to improve the writing skill, which student-level variables should rather support.

Recommendations

Suggestions for educators and practice

- This study proved that students' writing knowledge has a significant impact on their writing performance.. Because of this, it is very important to have writing activities in the classroom to help students learn how to write better texts.
- It is of great importance for individuals to encounter and read works of literature that contain qualified and different types of genres from an early age. For this reason, starting from primary school, it should be ensured that students encounter qualified texts through both textbooks and children's literature products, and further studies should be carried out to improve their comprehension and writing skills.
- Creating educational environments that will encourage and develop students' self-regulation skills is necessary.
- The present study determined that the text-writing instruction self-efficacy beliefs of classroom teachers were high, yet their knowledge of text-writing instruction was at moderate level. Various trainings may be conducted to improve teachers' knowledge of text-writing.

Suggestions for researchers

- The student-level variables examined in the study explained the text-writing performance by 24%. Further studies are recommended to determine other student-level variables that affect students' writing performance.
- The variance rate (22%) observed at the classroom level did not arise from the teacher variables examined within the scope of the study. There are quite a restricted number of studies in the literature that examine the effects of variables in the teacher dimension on students' text-writing skills. It is recommended that further research be conducted to eliminate this gap. In addition, more studies may be conducted to determine which qualifications of classroom teachers influence students' writing skills.
- The results of the study indicated that teachers' self-efficacy beliefs were high in text-writing instruction but did not reflect much on students' success in writing texts. This led to the comment that the qualifications teachers believed they had and the work they performed in the classroom did not match well. According to this, further studies may be conducted to observe to what extent the teacher-level variable is valid in the classroom.
- This study concluded that writing motivation and writing anxiety do not have a significant impact on writing achievement. In the literature, there is a restricted number of studies -based on no experimental evidence- to examine the effects of such variables on writing skills. It is recommended that further studies be conducted to examine the effects of these variables on writing performance.

- This study has formed a two-level HLM as a student-level and classroom-level. Modelling studies could be conducted in which different levels such as school, district, province, and *variables* such as family, home, school type, class size, and gender are included.

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Author (s) Contribution Rate
The authors contributed equally at all stages of the research.

Conflicts of Interest
The authors reported no potential conflict of interest.

Ethical Approval
Since the data of this study, which was derived from the first author's doctoral thesis, were collected before 2020, the study does not require ethics committee approval. However, legal permission was obtained from the Ministry of National Education of Turkey. In addition, in this study, all the rules specified within the scope of the Higher Education Institutions Scientific Research and Publication Ethics Directive were complied with.

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