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THE SCIENCE
AND EDUCATION
AT THE BEGINNING
OF THE 21ST CENTURY
IN TURKEY



THE SCIENCE AND EDUCATION
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OF THE 21ST CENTURY IN TURKEY

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PREFACE

In the globalizing world, the scientific publications, books and academic studies become widespread just as the goods, services and current news become widespread by the help of media and international free circulation by passing beyond the borders of countries. Today, the information, comments or inventions belonging to a nation, a country, a university or an academician can reach out to the ends of the earth and the farthest countries on the same day as a result of dazzling improvement of the press and communication, and can be shared with other societies, cultures and scientists.

One of the important reflections of the international economic, politic and cultural relations' concentration is the concentration of the scientific and educational relations among states. The number of published books and articles by Turkish scientists abroad was little if any only 30 or 40 years ago; however, today, hundreds of articles and books are published abroad every year by prestigious journals and large publishers, and the information, inventions and evaluations of the science, art, sport, politics and education in Turkey are presented to the world.

This book is the second collective scientific study of Turkish academicians published in Bulgaria. The first book, "Education and Science in a Globalizing World: a Case Study of Turkey," which was published in Sofia in 2012, was dedicated to Prof. Dr. H. C. İbrahim Atalay. And, this second book in your hands is dedicated to Prof. Dr. Hayati Doğanay. This book has more than 130 authors and more than 85 scientific researches. It is gladsome that this book has the contribution of the guest authors from the USA, Belarus and Bulgaria with their valuable scientific studies. For this reason, I present my thanks to my colleagues Elena Galay, Zdravka Kostova and Edward C. Robeck for their constructive contributions. Particularly Salih Ceylan and Mehmet Zaman have important contributions to the publication organization of this work together with Nergiz Özkural, Kamile Gülün, Alaattin Kızılcıoğlu, Ebru Boyacıoğlu, Şule Aydın Tükeltürk, Nazlı Gökçe and Sevilay Kilmen. I thank my dear colleagues, who supported this scientific work one by one.

The first objective of this book is to make the voice of Turkish scientists be heard in the world, Europe and Balkans. The second objective of the book is to improve the scientific interaction and academic cooperation between Turkey and the friend and neighbors country Bulgaria. The third objective of this scientific study is to open the doors of European publication for those young scientists who have not yet published abroad to establish self-confidence, scientific content and motivation. Yet another objective of the book is to increase the scientific solidarity and cooperation among more than 40 academicians from different cities, universities and disciplines by gathering their studies in one book. In other words, the historians and mathematicians, biologists and chemists, geographers and statisticians, music and physics teachers, social scientists and scientists have met and united on the ground of science and education. The book, in this point of view, is an interdisciplinary study that reflects the scientific level reached by Turkish academicians. It is also significant and meaningful for this book that it was published on the 65th birthday of my dear teacher Prof. Dr. Hayati Doğanay to whom the book was dedicated.

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Hereby I express my sincere thanks to all academician friends and colleagues who made this book possible by their scientific works. Again, I express my sincere thanks to every one of the scientists who have arbitrated the book in Turkey and abroad by spending their valuable time, effort and work to make this beautiful work possible. I cannot thank enough to my teachers Prof. Dr. Aleksandır Drujinin, Assoc. Prof. Dr. Zdravka Kostova, Assoc. Prof. Dr. Igor Sharuho who held a great deal of responsibility and showed a great effort to support this humble publication as editors.

Assoc. Prof. Dr. Emin ATASOY

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INVESTIGATION AND COMPARISON OF 4TH AND 5TH GRADE TURKISH TEXTBOOKS IN TERMS OF READABILITY¹

Gökhan ÇETİNKAYA
Ergün HAMZADAYI
Yusuf GENÇER

INTRODUCTION

Over the past few decades, many academics have investigated the process of reading, yielded many insights into the nature of reading, discovered many features of reading and proposed many features of reading and proposed many theories and models to account for reading. But a clearly stated, empirically supported and theoretically unassailable definition of reading is still not available (Lin, 2002:16). In here we can define Reading as the process of processing, interpreting, and making sense of signs and symbols by the brain perceived through vocal organs and the eyes. The skill of reading enables the student to encounter new information, events, cases, and experiences by accessing various sources (Çetinkaya&Uzun, 2012:6). For the reader to be able to sustain the process of processing and interpreting the text in a competent manner, it is necessary for the legibility, readability, and comprehensibility, and difficulty level of the text to have properties that are parallel to the level of the target reader group (Çetinkaya, 2010). Reading has a dominant role in acquiring information in the self-learning process. Alongside this, in the guided learning process, texts in textbooks are among the most dominant teaching aids used by teachers. Due to the specified reason, bringing students together with texts that are relevant to their reading levels is of great significance in terms of the efficiency of the learning process. Thus, in the selection of texts in textbooks and the arrangement of selected texts, it is necessary to take many properties into consideration. As previously mentioned, "legibility", "readability", and "comprehensibility" are the basic properties that need to be taken into consideration in the selection and arrangement of the text.

In the 1920's, educators discovered a way to use vocabulary difficulty and sentence length to predict the difficulty level of a text. They embedded this method in readability formulas, which have proven their worth in over 80 years of application. Readability formulas are seductive. They are easy to learn, easy to use, and inexpensive (Dubay, 2004:2). They require no involvement from other people (such as test developers and test subjects). They give an impartial and objective measure (Redish&Selzer, 1985:2). Assessment of text readability is useful to know whether a text is written at a level suitable for the target audience (Sato, Matsuyoshi and Kondoh, 2008). In conducted studies it is evidently ascertained that in the process of processing and making sense of texts by the reader, the linguistic properties

¹ Initial results of this study were presented at the 11th National Primary Education Symposium, Rize, Turkey, 2012.

constituting the text influence this process either positively or negatively (Flesch, 1948; Powers, Summer and Kearl, 1958; Klare, 1968).

The purpose of this study is to measure and compare the readability of texts in the fourth and fifth grade Turkish textbooks, which is one of their significant properties. The "Çetinkaya-Uzun Readability Formula" with the purpose of definition and classification of the readability levels of Turkish texts was utilized for this measurement.

PROBLEM

The research questions of the study were formulated as below:

What are the average word and sentence length of texts in 4th and 5th grade Turkish course books?

What are the readability levels of texts in 4th and 5th grade Turkish course books?

What are the readability levels of informative texts in 4th and 5th grade Turkish course books?

What are the readability levels of narrative texts in 4th and 5th grade Turkish course books?

METHOD

UNIVERSE AND SAMPLE

The universe and sample of this study with the purpose of investigating and comparing the texts in 4th and 5th grade Turkish textbooks in terms of readability properties consists of 4th and 5th grade Turkish textbooks approved by the Head of the Turkish Education Board.

LIMITATIONS

Informative and narrative texts in the textbooks constituting the sample of the study were included under the scope of the study. Reading and free reading texts constituting the themes were included and listening texts were not included in the scope of the study. Consequently, 56 texts in 4th and 5th grade Turkish textbooks constitute the limitations of the study.

MODEL OF THE STUDY

The descriptive survey model was utilized in this study. The survey model is a model suitable for studies that are aiming to describe a past or currently existing case as it is (Karasar, 2005).

APPLICATION

As previously mentioned, for the purpose of defining and classifying the readability levels of texts under the scope of the study the "Çetinkaya-Uzun Readability Formula" was utilized. Two measurements are used in the "Çetinkaya-Uzun Readability Formula": (1) Average Word Length and (2) Average Sentence Length. Through the instructions below, it is possible to determine the readability scores of texts. The readability scores of texts were determined by means of the instructions suggested in the study of Çetinkaya (2010). The previously mentioned instruction is as follows:

Count the Words

Numbers, graphemes, symbols, and grapheme sets with gaps in between are accepted as words. Words and abbreviations separated with hyphens are accepted to be words. For instance:

Gel-git (come-go)

O.T.U (A.S.L)

Count the Sentences

Every unit considered being grammatically independent from the other object or sentence is accepted to be a sentence. Those ending with a full stop (.), question mark (?), colon (:), and two parentheses () are accepted to be sentences.

Count the Syllables

Count the syllables as phonated. For instance;

Gel (come) is accepted to be 1 syllable

Gel-sin (let him come) is accepted to be 2 syllables

Gi-de-lim (let's go) is accepted to be 3 syllables

Symbols and figures are accepted as phonated. For instance;

Cm is accepted to be 4 syllables

Find the average sentence length

In order to determine the average sentence length, divide the total number of words into the number of sentences.

ASL= Total number of words / Total number of sentences

Find the average word length

In order to determine the average word length, divide the total number of syllables into the total number of words.

AWL= Total number of syllables/ Total number of words

Calculate the formula

Insert the average sentence length and average word length, which you have obtained through the operation steps you have performed above, into their spaces in the readability formula equation below. The formula equation determining the readability levels of texts is as follows:

RS= $118,823 - 25,987 \times AWL - 0,971 \times ASL$

RS= Readability Score

ASL= Average sentence length

AWL= Average word length

On the other hand, in the stage of the definition of the difficulty levels of texts, again the definition table specified in the study of Çetinkaya (2010) was taken as a basis.

Tablo 2. Definition of the Readability Levels of Turkish Texts

Readability Score	Readability Level
0 - 34	Frustration Level
35 - 50	Educational Level
51 +	Independent Level

FINDINGS

In this section, tables have been composed on the readability levels of texts in Turkish textbooks under the scope of the study.

In Table (1) and Table (2) the abbreviations are stand for:

1= Informative text

2=Narrative text

AWL= Average word length

ASL= Average sentence length

RS= Readability score

FINDINGS REGARDING THE READABILITY LEVEL OF THE 4TH GRADE TURKISH TEXTBOOK

Table 1. Readability Levels of Texts in the 4th Grade Turkish Textbook

No	TITLE OF TEXT	Type	AWL	ASL	RS	Level
1	Golden Advises	1	2,671	6,093	43,495	Educational
2	We Won the Match	2	2,59	6,988	44,731	Educational
3	Small Lemon Tree	2	2,621	11,647	39,401	Educational
4	I am Mustafa Kemal	1	2,661	6,901	42,970	Educational
5	Ataturk's High Sense of Humanity	1	2,876	7,2	37,093	Educational
6	Ataturk and Children	1	3,049	9,608	30,259	Frustration
7	Winter Preparations	2	2,445	8,884	46,658	Educational
8	Speaking Items	2	2,740	6,528	41,279	Educational
9	Cotton from the Field to the Factory	2	2,434	10,833	45,051	Educational
10	The Pottery Master Turtle	2	2,506	6,264	47,617	Educational
11	Wonderful Activities of the Inventor Grandfather	2	2,582	6,893	45,031	Educational
12	Visitors of the Past Times	2	2,840	6,916	38,304	Educational
13	From Ordered Beads to Computers	1	2,939	8,846	33,857	Frustration
14	Question Balloons	2	2,738	10,302	37,667	Educational
15	Happy Park	2	2,696	7,561	41,420	Educational
16	The Things I learnt from my Grandfather	2	2,622	6,985	43,902	Educational
17	I am a Friend of your Stomach	2	2,609	5,968	45,227	Educational
18	Tooth Decay	1	1,979	12,315	55,436	Independent
19	The Curious Traveler Turtle is in Rize	2	2,556	6,301	46,281	Educational
20	Amasya is a Legend	1	2,672	7,365	42,234	Educational
21	Olive Oil, the Child of Olives	1	2,897	11,448	32,422	Frustration

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22	Safranbolu Homes	1	2,807	9,063	37,077	Educational
23	The Story of a Book	2	2,651	10,487	39,748	Educational
24	Our Proverbs	1	2,772	8,428	38,603	Educational
25	Stars Wearing Glasses	2	2,500	6,607	47,440	Educational
26	Robots that go to School	2	2,331	8,051	50,429	Independent
27	Why do we have dreams?	1	2,935	7,023	35,731	Educational
28	The Necklace of the White Girl	2	2,543	6,239	46,679	Educational
AVERAGES			2,652	8,133	42,008	Educational

When Table (1) is examined, it can be observed that eleven of them are informative and seventeen are narrative texts. It can be observed that among the eleven informative texts in Table (1), three are at "frustration" level, one is at "independent reading" level and seven are at "educational" level. On the other hand, it can be observed that among the seventeen narrative texts in Table (1), one is at an "independent reading" level and sixteen are at an "educational reading" level; however, there are no texts at a "frustration" level.

FINDINGS REGARDING THE READABILITY LEVEL OF THE 5TH GRADE TURKISH TEXTBOOK

Table 2. Readability Levels of Texts in the 5th Grade Turkish Textbook

No	TITLE OF TEXT	Type	AWL	ASL	RS	Level
1	Kite	2	2,655	4,312	45,640	Educational
2	Making a Mountain out of a Molehill	1	2,772	7,345	39,655	Educational
3	Sweet Grandpa	2	2,539	5,855	47,156	Educational
4	Salamander Meeting	2	2,670	11,180	38,581	Educational
5	Hello Soldier	1	2,781	8,7	38,105	Educational
6	Works of Ataturk	1	2,778	10,031	36,891	Educational
7	Ataturk and the Turkish Language	1	2,786	14,724	32,126	Frustration
8	House of Sticks	2	2,652	8,034	42,104	Educational
9	From Caterpillar to Butterfly	1	2,761	8,4	38,916	Educational
10	Sufficient and Balanced Nutrition	1	2,480	12,85	41,897	Educational
11	Winged Honey Box	1	2,633	13,533	37,258	Educational
12	My Beautiful Language	2	2,614	10,732	40,472	Educational
13	Hacı Bektaş Veli	2	2,629	6,909	43,794	Educational
14	Father Karagöz and Master Hacivat	2	2,796	6,898	39,465	Educational
15	Tongue Twister Uncle	2	2,622	7,359	43,539	Educational
16	Small Snowflake	2	2,637	6,902	43,593	Educational

17	Life in Space	1	2,830	8,833	36,702	Educational
18	The Space Telescope and Edwin Powell Hubble (1889 - 1953)	2	2,595	7,875	43,740	Educational
19	Stay Here	1	2,625	7,047	43,764	Educational
20	Four Season Four Beauties: Abant	1	2,874	15,370	29,212	Frustration
21	The Skirts of Mount Ida with a thousand springs: Zeytinli	1	2,794	9,642	36,852	Educational
22	Everything Started with a Kite	1	2,398	8,625	48,131	Educational
23	E-mail with a Click	1	3,057	9,838	29,828	Frustration
24	Everywhere the Sun rises	2	2,482	6,622	47,893	Educational
25	The Child Told the Truth	2	2,494	6,491	47,708	Educational
26	Look at these Staues	1	2,553	7,952	44,756	Educational
27	The Small Marbling Master	2	2,777	6,591	40,257	Educational
28	Arts Education	1	2,685	11,478	37,902	Educational
AVERAGES				8,933	40,581	

When Table (2) is examined, it can be observed that there are fifteen informative and thirteen narrative texts. It can be observed that among the fifteen informative texts in Table (2) three are at "frustration" level, and twelve are at "educational reading" level. On the other hand, it can be observed that all narrative texts in Table (2) are at "educational reading" level and there are no texts at "frustration" and "independent reading" level.

FINDINGS REGARDING THE READABILITY LEVELS OF INFORMATIVE TEXTS IN TURKISH TEXTBOOKS

Table 3. Readability Levels of Texts in 4th and 5th Grade Textbooks

Grade	Independent	Educational	Frustration	Total
4 th Grade Number	1	7	3	11
4 th Grade %	9.1	63.63	27.27	100
5 th Grade Number	0	12	3	15
5 th Grade %	00.00	80.00	20.00	100

When Table (3), which indicates the numeric and percentile distribution regarding the readability levels of informative texts in the 4th and 5th grade textbooks are examined, it can be observed that the most accumulation for both textbooks is at the "educational reading" level. It can be observed that while there is one text in the 4th grade textbook at the "Independent reading" level, there is no text at the mentioned level in 5th grade textbooks.

FINDINGS REGARDING THE READABILITY LEVELS OF NARRATIVE TEXTS IN TURKISH TEXTBOOKS**Table 4** Readability Levels of Narrative Texts in 4th and 5th Grade Textbooks

Grade	Independent	Educational	Frustration	Total
4 th Grade Number	1	16	0	17
4 th Grade %	5.88	94.12	00.00	100
5 th Grade Number	0	13	0	13
5 th Grade %	00.00	100.00	00.00	100

When Table (3), which indicates the numeric and percentile distribution regarding the readability levels of narrative texts in the 4th and 5th grade textbooks are examined, it can be observed that while 84% of texts in the 4th grade textbook are at an "educational reading" level, all texts in the 5th grade textbook are at an "educational reading" level.

CONCLUSION

As previously mentioned, in activities oriented at having students acquire competent reading skills, it is necessary to take into consideration the legibility, readability, and comprehensibility properties of texts to be used in the reading process. The findings ascertained in the study demonstrate that the informative and narrative texts in both textbooks are usable in in-class education. This is because, the educational reading level is the level, in which the reader can process and make sense of the text with the assistance of an educator.

On the other hand, it was determined that there was no significant difference between the texts in the fourth grade textbook and the texts in the fifth grade textbook in terms of readability scores. In addition to this, it was determined that the texts in the 4th grade textbook were at a reading difficulty level that was 1,427 points higher. However, the texts in the 4th grade textbooks should have been at a higher reading level in parallel with the development of students.

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