Readability Level of Arabic Language Textbook of the Sixth Grade in the State of Kuwait

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Abstract

The current study aimed to identify the level of readability of the sixth-grade Arabic language textbooks in the State of Kuwait from the viewpoint of Arabic language teachers, and in light of the students' performance in reading the Cloze test of these books. For the current study, a tool was prepared that was applied to a sample of (200) male and female Arabic language teachers in the middle stage. The reading Cloze test was applied to a sample of (320) male and female sixth-grade students. The results of the study revealed that teachers' estimates of the level of readability of reading textbooks prescribed in the book entitled "My Arabic language" were of a moderate degree, with relative weight (57.8%). The results also showed that most of the students were distributed within the depressive level of readability, with a percent of (76.9%) and (16.6%) within the educational level, and (6.5%) within the independent level. It is also showed that there were statistically significant differences between the mean individuals of the sample of both sexes on the reading Cloze test in favor of females and that there were no differences based on the educational Zone. In light of the study results, a set of recommendations was presented.

Keywords: readability, methods of measuring readability, level of readability

1. Introduction

The Arabic language is spoken by more than 400 million persons around the world in nearly two dozen countries, it holds the dual distinction of being the fifth most widely spoken language. The Arabic language is also distinguished by being one of the fastest-growing languages in the world in modern times. However, it also faces the challenge of being a diglossic language (Haeri, 2000, Cote, 2009). Diglossia refers to the fact that the Arabic language is one of the languages that have two distinct forms;
a standard written form and a widely spoken language. The Arabic language has a formal Modern Standard Arabic that coexists with numerous national vernaculars. Arabic is a diglossic language as it has two forms; an oral form and a literary one. Diglossia is a key barrier to reading acquisition for native Arabic speakers (Johnson & Johnson, 1999, Eviatar & Ibrahim, 2012).

Reading skill is one of the four key language skills and competencies that are crucial in any language acquisition. Similar to the listening skill, it is a receptive skill, it is an extension of the skills of writing, listening, and speaking. (Ghani, et al., 2011). In an early stage of language learning, reading skills should be emphasized and focused on as a key indicator of linguistic proficiency. Language learning and use depend mainly on mastery of reading skills and subskills including skimming and scanning. According to Snow & Sweet (2003), reading comprehension is a complex process that involves many subcomponent skills and abilities that vary between readers.

The difference in reading ability relates closely with two levels of processing: lower-level word reading accuracy and fluency and higher-level comprehension-related linguistic and cognitive abilities (Pazzaglia, Cornoldi & Tresoldi, 1993), which include abilities to work memory, inferencing, integration of information, and metacognitive strategies use (Oakhill, Cain & Bryant, 2003). The two skill levels are important for achieving higher levels of reading comprehension; therefore, inadequate word reading impairs the deployment of higher-level processes (Hoover & Gough, 1990; Perfetti, 1985; Stanovich, 1991). Hence, research should investigate ways of fast and accurate word decoding as an essential prerequisite for good reading comprehension (Abu-Leil, Share, and Ibrahim, 2014).

Textbooks represent a fertile material for developing reading skills, it is the main tool for improving the teaching/learning process. It’s one of the main pillars for helping learners to enhance their learning. Textbooks provide educators with a general framework of the taught material; it also guides them in their endeavors to get acquire knowledge. (Al-Naji, 1994). According to Soliman (2002), a textbook is no more a means of learning nowadays, but it became one of the most important tools for learning in an era that is characterized by overwhelming technological innovation. Therefore, books in general, and specifically textbooks represent a tool for improving society. Also, the textbook is an integral part of the school curriculum, it is the container of taught material. It is a pivotal element for achieving educational goals.

Teachers rely on textbooks to provide learners the opportunity to improve experiences, skills, competencies, values, and attitudes that make them well qualified for leading a better life later on. The textbook is therefore the most influential factor that may enhance the learning process. Therefore, textbooks should be developed to increase readability levels. Mekdad and Alzoughby (2004) indicated increasing readability level is closely related to the style of authoring and producing textbooks.

Readability can be viewed as an active interaction between the reading material and readers. Although educators do not agree on a unified definition of readability, readability is the degree of reading texts to readers in terms of difficulty, whether texts are readable or not. High levels of texts readability ensure higher levels of students’ engagement in the taught reading texts, which leads to the ultimate success of communicative interaction between readers and reading texts (Jawarnah, 2008).

Since the textbook is the most influential factor in the teaching/learning process, it is necessary to evaluate textbooks continually to seem suitable for students’ age, skills, and linguistic and intellectual capabilities. Before any endeavor for improvement, it is necessary to assess textbooks’ readability levels based on educational and technical bases.

2. Literature Review

2.1 Readability in Arabic

Reading comprehension - in diglossic languages such as the Arabic language – is adversely affected, hence learners find it difficult to achieve proficiency in reading. Also, text readability closely relates to the nature of the Arabic language. However, research on the readability level in the Arabic language has not received the same attention as other languages. According to Jonathan Neil (2014), English has
been the principal language of investigation in terms of readability research, although scholars have researched readability in several other languages, including French (François and Watrin, 2011), German (Hancke et al., 2012), and even MSA (Al-Khalifa and Al-Ajlan, 2010). Text readability has been for a long time a topic that attracts the attention of educators, psychologists, and linguists. Readability can be viewed as the ability of a text to be read and understood by its reader in an acceptable amount of time and effort (Cavalli-Sforza, Saddiki, & Nassiri, 2018). The term ‘readability’ generally indicates the level of difficulty in reading and understanding a text by a reader (Saddiki, Cavalli-Sforza, and Bouzoubaa, 2017).

Readability is a deeply rooted concept in literacy research, an early definition of readability was introduced by Dale and Chall (1949), it focused mainly on the concept of interest, but since textbooks are not read because they are interesting, readability should be understood in terms of the degree of easiness or difficulty with which the textbook may be understood (Kasule, 2011). Therefore, readability is viewed as an interactive process between the reader, the text, and the writer.

Prins and Ulijn (1998) define readability as “the ability of the text to communicate the intention of the writer to the intended reader” (p.141). As such, the concept of readability contains three aspects related to each other which are interest, easy to read, and easy to understand (Chall, 1974). Writers pay due attention to pieces of writing produced especially the books designed for learning purposes in academic institutions. Textbooks with high readability level enhance academic achievement as it helps the learner to deeply understand messages delivered through these textbooks. Authors have to pay in mind to raise readers’ interest in the materials they provide in their books, to produce readable texts, and to adjust these materials to be easy for understanding and comprehension.

2.2 Level of readability

Text readability is important for language readers in general and specifically for language learners. It stems from the importance of reading skill itself, where reading is significant for better academic performance. Therefore, students sometimes suffer academically not because they cannot get higher scores in the achievement tests, rather, text readability levels are low to the degree that they are not able to process information in different academic subject areas.

In everyday life, individuals need some level of literacy to be able to perform the most manual of jobs and to access medical, legal, and other types of information (Saddiki, Cavalli-Sforza, and Bouzoubaa, 2017). Text readability is the ability to understand and comprehend a given text. Therefore, it depends on many intertwined factors: the style of writing, the percentage of difficult words contained in the text, the length of the sentences (Al-Tamimi, et al., 2014).

The textbook is a crucial element in the learning problem, good textbooks should contain attractive materials that motivate students to learn (Abd Gani & Ismail, 2015), which constitutes an appropriate readability level necessary to encourage learners to continue learning (Hamjah et al., 2011). This leads to increased reading comprehension which is manifested in better academic achievement in reading comprehension tests.

2.3 Methods of measuring text readability

Assessing text readability levels in the Arabic language is still largely underserved in both research and software development. Few assessment tools to assess readability level has been released to stand on the text difficulty and readability levels (Saddiki, Cavalli-Sforza, and Bouzoubaa, 2017). Readability can be measured in terms of discreet grade levels (1, 2, 5, etc.), difficulty levels (easy, intermediate, difficult), or score ranges on a scale (DuBay, 2007). This traditional method was only has remained largely unchanged until computational approaches for natural language processing and machine learning developed. Since then, the main research focus has gradually shifted from “quantifying” reading difficulty to “automating” both the development and application of readability measures to texts (Kevyn, 2014).
Measuring readability is a matter of quantifying the spoken elements to estimate the degree of difficulty of a text for a reader (Saddiki, Bouzoubaa, and Violetta Cavalli-Sforza, 2015). Several tools have been developed to assess text readability, these tools can fall into three main categories: 1) readability measures with human input, 2) readability formulas, and 3) readability as a machine learning model.

2.3.1 Readability Measures with Human Input

Several common methods developed to measure the level of text readability rely on the human element: (1) expert judgment, (2) learners’ judgment of comparative difficulty of texts, (3) scored comprehension questions, (4) and the Cloze test (Al-Khalifa & Al-Ajlan, 2010). According to Arifin (2013), the cloze test involves deleting words from a text, typically every 5th or 7th word, and testing readers’ understanding by how successfully they can fill in the blanks. This kind of test has been extensively used as a measure of text readability level in Arabic ((Hofman, & Habib-Allah, 1982, Araj, 1999, Al-Rashidi, 2005, Abu-Saleet, 2007).

Human-input-based readability measures are dependable for a long time. However, with the advent of online tools, human-based measures shifted to online platforms (Saddiki, Bouzoubaa & Cavalli-Sforza, 1982). Crowdsourcing non-expert input as a “good-enough” means for assessing the text readability levels has been traditionally accepted in the absence of expert judgment (De Clerq et al., 2014). Hence, linguists, as well as educational experts, have to develop automated methods with a strong human factor to eradicate errors that may coincide with measures relying on the reading texts themselves.

2.3.2 Readability Formulas

Another developed manual readability level measure is readability. It is argued that it is a widespread traditional approach to text readability as it relies on manual extraction of readability parameters, more than 200 readability formulas in the English language for instance (AI-Khalifa & AI-Ajlan, 2010). The result of readability index formulas takes the shape of an equation where the parameters including average sentence length or average word length, take values from the text to assess, whereas, the output takes the shape of a numeric score on a scale mapped to increasing difficulty levels (Saddiki, Bouzoubaa & Cavalli-Sforza, 1982).

Among the well-known readability formulas in the English language is the Automated Readability Index (ARI) for English (Al-Khalifa & Al-Ajlan, 2010, Al Tamimi, et al., 2013). While exploring modern literature on readability in the Arabic language, only two formulas can be detected namely, the Dawood formula (1977) which has been designed mainly for the last 3 grades of elementary education, and the Al-Heeti formula (1984) that also targets elementary grade levels, but only involves one factor, which is the average word length in characters (Al-halifa & Al-Ajlan, 2010, Al Tamimi, et al., 2013, Cavalli-Sforza, EI Mezouar & Saddiki, 2014).

2.3.3 Readability as a Machine Learning Model

An emerging paradigm in readability level assessment relies on the use of NLP-based features and machine learning algorithms. It goes a step further than the traditional manual regression study to build the readability model (Franyois & Miltsakaki, 2012). The so-called “AI” readability measurement approach is distinguished as it outperforms traditional formulas. Also, NLP-generated “non-classic” features were to some extent more predictive once compared with traditional approaches.

In terms of generalization, ML algorithms are more accurate on new observations than classic linear regression. Therefore, a mixture of both traditional readability detection approaches and NLP-enabled features enhances drastically the readability predications (Saddiki, Bouzoubaa & Cavalli-Sforza, 1982). According to de Vries and Stern (2016), NLP techniques can be used to automatically
extract a rich set of linguistic features associated with readability levels. It is worth noting that NLP allows assessors in the field of readability to use more linguistic knowledge compared with traditional readability formulas. Therefore, using NLP and ML enhance the opportunities of producing accurate models for readability prediction than standard readability formulas, it produces a data-driven approach to readability measurement that helps to build more predictive models that work well with language readability testing (Si and Callan, 2001, Collins-Thompson, 2014, Al-Khalifa and Al-Ajlan, 2010).

2.4 Problem of Research

Textbooks can be considered as books that are referred to by students at a specific level as an instructional medium related to a specific learning field. Regardless of the transformations in the contemporary education systems, the textbook has become a primary reference, even with the advent of appealing teaching aids such as the internet and other multimedia materials (Hussain & Mamat, 2019). In the state of Kuwait, the book is one of the primary sources of information in almost every educational stage. However, a major problem lies in the process of shifting books into textbooks to be used in the learning process without enough regulations to ensure high readability levels (Husaini, Abd Rahman, Ghazali & Abdullah, 2014; Abdul Ghani, Noh & Nik, 2017). Otherwise, lower readability selected textbooks may hinder the learning process (Sjahrony, Lubis & Yusoff, 2017).

The current study identifies the level of readability of the sixth-grade Arabic language textbooks in the State of Kuwait from the viewpoint of Arabic language teachers, and in light of the students’ performance in reading the Cloze test of these books. The current study is significant due to the following considerations:

1. The study constitutes an endeavor from the Kuwaiti Ministry of Education to both assess and develop curricula and school syllabi of the Middle schools to achieve prescribed targets.
2. It helps curriculum planners and educational policymakers to stand on the suitability of the Arabic language reading textbook of the sixth year in the State of Kuwait.
3. It also helps Arabic language textbooks and curricula developing specialists to rethink of rules of designing reading texts for students in the middle stage.

2.5 The context of the study

Research that investigated readability levels in the Arabic language has been for a long time neglected. One of the chief areas of investigation is readability levels in Arabic language textbooks, among these studies is that conducted by Alsarhani (2011), which investigates the readability level of Arabic language textbooks of fourth-year primary stage and the engagement level it provides to learners. Two prose texts have been selected randomly, and 10 pages to engage learners. The sample of the study consists of 303 fourth-year primary school pupils. Findings revealed that the readability level was low and there are statistically significant differences in the readability levels in favor of females.

In their study, Moumni & Almoumini (2011) investigated the readability level of fourth-year primary school textbooks in the Arabic language. Also, it tried to assess the impact of gender on the readability level of 292 fourth-year primary school pupils in Jordan. Results of the study indicated that pupils’ performance in the cloze test falls in the depressive level. Also, it is shown that there are statistically significant differences in the readability level of three texts in favor of females. Hazaimah (2011) investigated the readability level of seventh-year intermediate school Arabic language textbooks in Jordan concerning variables of gender, school type, and nature of knowledge. Four texts were selected; two of scientific nature and the other two literary texts. The sample of the study consists of 412 students who were randomly selected. Findings revealed that the readability level of textbooks was at the educational level. Also, there are statistically significant differences in students’ mean scores in favor of females, literary texts, and kind of knowledge.

In a related context, Mahmoud (2012) aimed at investigating the readability level of Arabic
language textbooks in the primary stage schools in Egypt using computer software from teachers' viewpoint. Two tools were designed for use in the current study; computer software for assessing readability level based on “Basyoni & Elheiti”, and a questionnaire implemented to 125 primary stage teachers. Findings revealed that texts fall in the educational/depressive level in terms of sentence length. Teachers view that textbooks’ readability level lies in the educational level in terms of sentence length as it is suitable for learners. Also, a positive correlation can be detected between the software results and teachers’ viewpoints concerning the readability levels of Arabic language textbooks in the three grades successively.

Another study conducted by Nasr & Ibrahimi (2013) investigated the readability level of modified "Loghatona al-Arabiya" textbook for fifth-grade pupils in Jordan. Cloze test was used with 40 students who were randomly selected from two schools. Findings revealed that 52% of the study sample lies in the depressive level of readability, 45% lies at the educational level, whereas, 2% lies at the independent level. Also, no statistically significant differences can be detected attributed to gender. Dahlan (2014) investigated the readability level of ninth grade Arabic language textbooks on Palestine, it also tries to assess the influence of gender in readability perception. Cloze test has been used in three main texts implemented on 69 intermediate stage students. Results showed that Arabic textbooks' readability level is high, 62% of the study sample lies in both independent and educational levels. It is also indicated that there are statistically significant differences in the students’ responses attributed to gender.

Also, Alzweini and Al-lami (2014) investigated the readability level of the oration textbook of the fifth-grade intermediate school in Iraq concerning gender and specialization. Ten cloze tests have been designed to assess the readability of 10 oratory texts of 300 students. Findings revealed that readability levels of fifth-year textbooks were average, texts were not gradually ordered in terms of readability. Also, there are statistically significant differences in students’ responses to the degree of readability in favor of females. Al-haj and Younis (2016) investigated the readability level of third-year primary school textbooks in Palestine. Cloze tests were used to assess the readability level of 200 students. Results indicated that the Arabic language textbooks' readability level was low. Also, the mean sentence length is 6 words making texts difficult to be understood.

Besides, Omar (2017) investigated the readability level of the oration textbook of the 12th grade in the North Gaza governorate. A questionnaire was designed mainly to assess the readability level of 49 twelfth-grade teachers. Findings revealed that readability level was average (67%), also sentence readability level is average (68%), whereas words readability level seems to be high (71%), ideas readability level was also high (72%), and style readability level was also high (73%). Also, it was revealed that there are statistically significant differences in the mean scores of respondents in terms of readability in favor of time off work in the field of teaching 5-10 years.

It is necessary to assess the curricula and syllabi side by side with the importance of developing these books according to the prescribed goals to get rid of deficiencies and drawbacks. Based on the results of previous studies and field reports, there are deficiencies in the reading skills of middle schools in the State of Kuwait (Azmi, 2018). New educational trends on the factors that influence the levels of reading skills and reasons for deficiencies in reading. Therefore, the current study tries to investigate the levels of readability of textbooks of the sixth grade in the State of Kuwait.

The current study tries hard to answer the following questions:
1. What are the sixth-grade Arabic language teachers' viewpoints of the level of readability of textbooks in the State of Kuwait?
2. What are the readability levels of Arabic language textbooks in the State of Kuwait based on the reading Cloze Test?
3. Are there statistically significant differences between the mean individuals of the sample of both males and females on the reading Cloze test?
4. Are there statistically significant differences between the mean individuals of the sample of the study based on the educational Zone?
3. Methods

3.1 General Background of Research

Readability differs from reading ability, readability focuses on reading materials while reading focuses on the readers themselves (Tay, 2005). Hence, readability can be classified into levels: 1) free reading that utilizes an easy-to-read or easy-to-understand text characterized by excellent comprehension, 2) excellent in identifying words, and 3) fluent reading rate and has only a few mistakes in all aspects (Marohaini, 1999). Readability is the level of difficulty that a particular document presents to readers. Whether readers are adults or children, native or non-native speakers of the target language, they may suffer a certain degree of readability problems. Readability levels vary according to the nature of the language, also varies in the given situation, thus, researchers couldn’t form a single definition for readability, rather, they used a common metric for difficulty level or readability is in terms of the years of formal education that is required, on average, to comprehend a given document (Forsyth, 2014).

Students found difficulty in getting the main idea in the text not because of the text difficulty but because of the readability level of the text. Textbook writers usually pay due attention to keeping a balanced level of readability in mainstream public schools in different disciplines. The current study is a step to think outside the box; several studies have investigated the effect of various teaching strategies on developing Arabic reading skills, others tried hard to develop the material and curriculum. Scarce studies focused on the impact of readability on the students’ reading skills performance. The current study investigates the level of readability of Arabic language textbooks in the State of Kuwait. It provides a full qualitative and quantitative expression through obtaining and analyzing results through Cloze Test to know the readability level of Arabic language textbooks of the sixth-year middle school students.

3.2 Sample of Research

The total number of Arabic language middle school teachers who are teaching the Arabic language for the sixth-grade students is (720) teachers. Concerning the students’ population are all students studying in the sixth grade at mainstream governmental schools, ministry of education, state of Kuwait, in the academic year 2016-2017. Table (1) states the distribution of the population of the study:

| Description of the study population controlling gender |
|-------------------------------------------------------|
| The Sample                                           |
| Gender No.   Percentage No. Percentage No. Percentage |
| Males 315 43.8% 405 56.2% 720 100%                  |
| Females 15976 48.7% 16817 51.3% 32793 100%           |

It is clear from table (1) that the total number of teachers is (720) males and female teachers. They are teaching Arabic language textbooks for sixth-grade students, (315) male teachers, forming (43.8%), and (405) female teachers, forming (56.2%). The total number of sixth-year students are (32793) students of both gender; (15976) male students forming (47.7%), and (16817) female students forming (51.3%).

Teachers’ Sample: 200 male and female Arabic language teachers were selected randomly as they are teaching sixth-grade reading textbooks for middle schools in the educational zones of Assema, Jahra, and Mubarak Al Kabeer.

Students’ sample: Four middle stage schools have been selected for each educational zone, two female schools, and two male schools, the mean number of students is (26) male and female students. Therefore, the total number of students in 12 schools are (320) male and female students; (158) male students with a percentage of (49.9%), and (162) female students with a percentage of (50.6%).
(2) shows the distribution of students’ sample in terms of educational region and school type:

| Educational Zone | Male Schools | Female Schools | No. of Students | No. of Students |
|------------------|--------------|----------------|-----------------|----------------|
| Assema           | Seif AlDawla | Al-Nozha        | 26              | 28             |
|                  | AlKhalil Ibn Ahmed | Naela        | 27              | 26             |
| Mubarak Al-Kabeer| Soliman Abdulrazik AlMutawa | Hafsa       | 25              | 29             |
|                  | AbulKassem Al-Shabby | Ramlaa Om Al-Moumenein | 27          | 24             |
| Jahraa           | Abu Tammam    | Sara Saleh Rashid AlTawheed | 28          | 27             |
|                  | Abdulrahman Khalid Abdulgader | Al Samtah    | 25              | 28             |
| Total            |              |                 | **158**         | **162**        |

### 3.3 Instrument and Procedures

After reviewing the previous studies, whether, in the Arabic region or international context that are related to Arabic text readability, the following instruments were designed to be used in the study:

- **Questionnaire**: To assess Arabic language teachers’ viewpoints of the readability level of the sixth-grade students in the State of Kuwait, a 23 items questionnaire has been designed. It was developed according to the literature reviewed of the most relevant studies that dealt with assessing Arabic language textbooks and the level of readability.

- **Questionnaire Validity**: The first draft of the questionnaire consists of 35 items, it was displayed to the committee of jury members from specialists in the curricula & instruction department, at both Kuwait University and PAAET. The jury members were advised to rephrase certain items; 12 items have been omitted due to being similar to other items. The final version of the questionnaire, therefore, consists of 23 items.

- **Questionnaire Reliability**: The questionnaire has been implemented on a sample of 30 sixth grade teachers teaching the Arabic language textbook "My Arabic language". This sample has been selected from two middle schools for boys and the other two schools for girls in Hawalli educational zone. The reliability of the questionnaire has been calculated through Alpha-Cronbach, it was revealed that the reliability coefficient was .817, which seems to be high.

- **Cloze Test**: A cloze test was designed to assess the readability level of Arabic language textbooks taught to sixth-grade students in public schools in Kuwait. The Cloze Test is characterized by being easy to apply for its suitability for the perception level.

#### 3.3.1 Constructing Cloze Test

1. Reviewing the book "My Arabic Language: Part 2" for sixth-grade students in the second semester of the academic year 2016-2017. Five texts have been selected to be included in the study. Table 3 shows the texts selected.

| No. | Text Title               | No. of Pages | Unit |
|-----|--------------------------|--------------|------|
| 1   | Bad behaviors            | 24-25        | 1st  |
| 2   | Voyage & cultural trip   | 30-31        | 1st  |
| 3   | Sad nightingale           | 66-67        | 2nd  |
| 4   | My grandmother’s tales   | 71-72        | 2nd  |
| 5   | Father, mother, and nails| 103-104      | 3rd  |

2. The fifth word in each sentence in the text has been systematically deleted, proper names and
prepositions also have been excluded.

3.空间 has been provided in the place of the deleted words, paying due attention that all spaces provided are equal in length in order not to represent a hint to the answer. The number of spaces is 20 spaces, and the total number of spaces is 100 in the five texts selected.

4. Printing each text on a separate paper, keeping similar font type and color.

5. The class teacher distributes the five tests on a week-long; the first test was administered on Sunday, the second on Monday, till the last one was administered on Thursday.

6. The teacher has delivered test instructions to the students, these instructions include:
   - Write the name of students and schools
   - Reading the whole text before filling the spaces.
   - Fill in each space with only one word.
   - Deciding the allowed time to answer the test.

3.3.2 Cloze Test answer Key

One mark has been assigned to each correct answer, whether it is an accurate answer or similar to the meaning. Otherwise, the incorrect answer is marked zero. Therefore, the score of each text is 20 marks, and the total score for the five texts is 100 marks.

The researcher has adopted Harrison’ classification (Harrison, 1984), it classifies students according to their readability levels of texts tested as follows:

1. Independent level: It refers to the students’ ability to achieve 60% or more on readability tests.
2. Instructional level: It refers to the students’ ability to achieve 40% or less than 60% on the readability test.
3. Frustrational level: It refers to the students’ ability to achieve less than 40% on the readability test.

- Test Validity: The initial form of the test has been displayed to a committee of jury members to stand on the test validity. Five staff members of curricula and instruction, College of Education, Kuwait University, and 8 Arabic language supervisors. Due attention has been duly taken into consideration to modify the test and provide the final version of the test.

- Test Reliability: The test-retest coefficient has been calculated to assess test reliability. An intact sixth-grade class in Hawalli educational zone has been selected for inclusion to assess test reliability. The class includes 32 students who were tested twice using the pretest, linear correlation coefficients between the two testing sessions were calculated. Table 4 shows the linear correlation coefficients.

Table 4: Test reliability coefficients

| No. | Text title                                    | Reliability coefficients |
|-----|----------------------------------------------|-------------------------|
| 1   | Bad behaviors                                | 0.784                   |
| 2   | Voyage & cultural trip                       | 0.801                   |
| 3   | Sad nightingale                              | 0.844                   |
| 4   | My grandmother’s tales                       | 0.793                   |
| 5   | Father, Mother, and nails                    | 0.821                   |
|     | Total Reliability coefficients               | 0.915                   |

Table 4 shows that test reliability coefficients range from 0.784 and 0.844 for texts included in the test. The total test reliability coefficient is 0.915, which is high denoting the test suitability for implementation.
3.4 Data Analysis

The Descriptive Analytical research design was used for its suitability to the nature of the study, it depends on describing the phenomenon as it is to achieve the target goals. Obeidat et al. (2003, 247) view that the descriptive-analytical research design “depends on studying the real situation or the current phenomenon as it is, it concerns with the accurate description of the phenomenon and provides a full qualitative and quantitative expression” through obtaining and analyzing results through Cloze Test to know the readability level of Arabic language textbooks of the sixth-year middle school students.

4. Results

With regards to the results of the first question, "What are the sixth-grade Arabic language teachers' viewpoints of the level of readability of textbooks in the State of Kuwait?”, mean scores of the questionnaire items have been calculated. Table 5 shows the results of the first question.

Table 5: Items order of Readability levels of the sixth-grade textbook for teachers' viewpoint

| No. | Item                                                                 | Mean Score Order |
|-----|----------------------------------------------------------------------|------------------|
| 18  | Text titles are meaningful and accurate                             | 3.28 Mid 1       |
| 13  | Texts are grammar errors-free                                       | 3.24 Mid 2       |
| 17  | Texts are free of linguistic errors                                 | 3.15 Mid 3       |
| 9   | Texts increase the linguistic wealth of learners                    | 3.13 Mid 4       |
| 8   | Vocabulary and expressions in texts are suitable for learners.      | 3.05 Mid 5       |
| 7   | Written texts are easy to the extent that learners are eager to read.| 3.04 Mid 6       |
| 21  | Texts focus on standard Arabic language                             | 3.03 Mid 7       |
| 14  | Texts are free of repetition and redundancy                         | 3.01 Mid 8       |
| 6   | Texts are written in clear handwriting                              | 2.98 Mid 9       |
| 11  | Texts are of varied topics (scientific, literary, religious, political, etc..) | 2.97 Mid 10     |
| 20  | Texts contribute to enriching learners' linguistic competences      | 2.95 Mid 11      |
| 10  | Texts are suitable for the age level of sixth-grade students.       | 2.94 Mid 12      |
| 23  | Texts aim to feed students’ imagination and enlarge their perception.| 2.89 Mid 13      |
| 15  | Textbooks include topics about local, regional, and global environments. | 2.88 Mid 14      |
| 12  | Texts are modern and cope with scientific development.              | 2.83 Mid 15      |
| 2   | Texts motivate learners to read.                                    | 2.82 Mid 16      |
| 22  | Texts aim to improve the values (religious, national, environmental, and scientific) of students. | 2.77 Mid 17      |
| 16  | Texts include pictures and drawings that relate to the main topic.  | 2.72 Mid 18      |
| 19  | Texts are various (poetry, essay, novel, and oration)               | 2.64 Mid 19      |
| 1   | Texts pay care to the individual differences among learners.        | 2.59 Low 20      |
| 4   | Texts improve learners' life skills.                                | 2.58 Low 21      |
| 3   | Texts are exciting.                                                 | 2.55 Low 22      |
| 5   | Written texts are easy to understand.                              | 2.51 Low 23      |
| Total|                                                                     | 2.89 Moderate     |

Table (5) shows that teachers’ estimations of the readability level of Arabic language textbooks for sixth-grade students were average based on mean scores of total sample responses. The mean score was average (2.89) out of (5) points, which is equivalent to relative weight (57.8%). Therefore, it can be concluded that reading material presented for the sixth-grade intermediate schools is characterized by being average in terms of clarity and suitability for students. Also, it is average in its difficulty and readability level.

The mean score of teachers’ responses of (19) items of the questionnaire range (2.64 – 3.28) which are average means, it is equivalent to (52.8% - 65.6%). On the other hand, the mean scores of 4 items were below average, which range (2.51 – 2.59), which is equivalent to relative weight (50.2% – 51.8%). The recurrent distinguished features in Arabic language textbooks in the respondents’ viewpoints are:
text titles are accurate; texts are spelling and syntactic error-free. While the least detected features are: the lack of paying attention to individual differences, detachment of texts and daily life experiences, lack of interest and entertainment, and the writing style does not facilitate the understanding of sixth-year pupils.

In general, intermediate school teachers view that Arabic language textbooks do not readable, they do not promote comprehension and understanding, it lacks entertainment elements. Texts also are detached from pupils’ daily life although they try to develop certain values. These textbooks are also detached from local and regional environmental issues. They also do not cope with up-to-date scientific advancements. Besides, Arabic language textbooks are not suitable for the pupils’ age and linguistic skills. However, textbooks vary among poetry, novel, and oration. Textbooks also include photos, drawings, and images related to texts provided.

To answer the second question of the study that states: "What are the readability levels of Arabic language textbooks in the State of Kuwait based on the reading Cloze Test?", the number of students and percentages of each level has been calculated based on their scores on Cloze Test. Table 6 shows these results.

**Table 6: Frequencies and Percentages of students based on their readability levels in Cloze Test**

| Lesson                     | Frequency |  | Frequency |  | Frequency |  |
|----------------------------|-----------|---|-----------|---|-----------|---|
| Bad behaviors              | 51        | 15.9% | 94        | 29.4% | 175       | 54.7% |
| Voyage & cultural trip     | 41        | 12.8% | 102       | 31.9% | 177       | 55.3% |
| Sad nightingale            | 48        | 15%   | 96        | 30%   | 176       | 55%   |
| My grandmother’s tales     | 58        | 18.1% | 109       | 34.1% | 153       | 47.8% |
| Father, Mother, and nails  | 26        | 8.1%  | 97        | 30.3% | 197       | 61.6% |
| Total                      | 214       | 6.5%  | 53        | 16.6% | 246       | 76.9% |

Table (6) reveals that the majority of pupils fall on the depressive level of readability, 246 students are representing 76.9% who feel depressive as they cannot read well the prescribed textbooks themselves. Those pupils are not able to comprehend the texts even with the help of their teachers. At the educational level, there are 53 pupils represent 16.6% as they can read texts easily and comprehend ideas included provided that teachers help them. In the independent level, there are only 21 pupils who represent 6.5%, those pupils can read, understand, and comprehend texts without the help of their teachers.

![Fig 1: Frequencies and Percentages of students based on their readability levels in Cloze Test](image)
These findings show that the readability level of the Arabic language textbook "Lughatay al Arabiya" is very low, as there are 76.9% of the pupils are depressive, they are unable to read texts themselves even with the help of their teachers.

To answer the third question that states: "Are there statistically significant differences between the mean individuals of the sample of both males and females on the reading Cloze test?", and to validate the first hypothesis that states: "There are no statistically significant differences between the mean individuals of the sample of both males and females on the reading Cloze test.", independent samples t-test values were calculated. Table 7 shows independent samples t-test values.

Table 7: Independent samples (males-females) t-test values of Cloze Test

| Scale       | Male (N.=158) | Female (N.=162) | t-value | df  | Sig. |
|-------------|---------------|----------------|---------|-----|------|
| Cloze test  | M. 6.291      | M. 31.06       | 6.291   | 318 | 0.00 |
|             | SD 31.06      | SD 36.47       |         |     |      |

T-test scores displayed in table (7) revealed that there are statistically significant differences in the mean scores of respondents of males and females in the cloze test. T-test score (6.291) at df (318) is significant at the significance level of 0.01 in favor of females. Mean scores of females 36.47 and males 31.06, refer to female pupils’ ability to read, understand, and comprehend texts easily more than their male counterparts. Accordingly, the null hypothesis is rejected as there are statistically significant differences between males and females in the cloze test in favor of females.

To answer the fourth question which states: "Are there statistically significant differences between the mean individuals of the sample of the study based on the educational Zone?", and to validate the second hypothesis that states: "There are no statistically significant differences between the mean individuals of the sample of the study based on the educational Zone.", ANOVA was calculated to test the differences between the mean individuals of the sample of the study based on the educational Zone. Table 8 shows these results.

Table 8: ANOVA results between the mean individuals of the study based on the educational Zone

| Test     | Variance         | Sum of squares | df  | Mean squares | F    | Sig |
|----------|------------------|----------------|-----|--------------|------|-----|
| Cloze Test | Between groups  | 44.1166        | 2   | 22.083       | 1.534| 0.197|
|          | Within groups    | 4563.450       | 317 | 14.396       |      |     |
|          | Total            | 4607.616       | 319 |              |      |     |

Table 8 shows that there are no statistically significant differences between the mean individuals of the sample of the study based on the educational Zone. One Way ANOVA reveals that there are no statistically significant differences in the mean scores based on the educational district in cloze test, (f =1.534) was not significant at the significance level 0.05. It can be concluded that pupils’ scores in educational districts are equal in their views towards the readability level of Arabic language textbooks. This means that students from different educational districts do not differ in their perception of the readability level. Therefore, the null hypothesis is rejected which reveals that no differences can be detected in the cloze test based on the educational districts.

5. Discussion

Findings also reveal that written material is acceptable in terms of text font type and size. Also, texts are full of excessive filling which leads to the lack of interest if reading these texts thought it is written in Standard Arabic language. Besides, linguistic expressions are suitable for pupils’ reading skills. Arabic language textbooks are spelling and syntactic error-free with accurate and decisive expressions.

The findings of the study cope with those of Mahmoud’s (2013) study which indicates that Arabic
language teachers agree that textbook readability is average in terms of sentence length, and suitability to pupils’ age. Also, it copes with the results obtained by Al-Zweini and Al-Lami (2014) that reveal textbooks do not have an acceptable level of readability as materials are not graded from the most to the least difficult. In a related context, Begeny & Greene, (2014), concluded that the difficulty level of provided texts is not suitable to the pupils’ age. Also, the results of the current study twined with the study of Omar (2017) which revealed that the readability level of textbooks is average.

Results of the current study cope with those of Alsarhany (2011) indicating that fourth-year Arabic language textbooks’ readability level is low and unsuitable for pupils. Also, Moumni and Almoumni (2011) indicated that students; responses in the cloze test fall in the depressive level. Besides, Alhaj and Younis (2016) revealed that the readability of textbooks is also low. Hazaimah (2011) concluded that textbook readability levels fall at the educational level.

The study conducted by Mahmoud (2012) indicated that textbook readability falls in the depressive level in terms of average word length. Also, Nasr and Al-Ibrahim (2013) indicated that 52% of the total sample of the study fall in the depressive level, 45% fall in the educational level, and 2% fall in the independence level. The current study findings also coincide with Alzweini & Al-lami (2014) which revealed that fifth-year intermediate school textbooks’ readability level is average. Orphan (2015) concluded that third- and fourth-year textbooks are very difficult and therefore very low in terms of readability. Again, the current study coincides with the study of Zorbaz & Mustafa, (2016) which revealed that textbooks are similar in terms of readability level, with the intermediate level more difficult compared with the advanced one.

On the other hand, the results of the current study contradict those obtained for the study conducted by Dahlan (2014) that revealed high levels of readability of ninth-year intermediate school Arabic language textbooks, about 62% of the sample falls on two levels; independent and educational. Orhan, (2015) concluded that the readability level of the first and second-grade textbook is average and suitable for LD students. Results may be attributed to the fact that females outperform males in their intellectual and linguistic competencies, this consolidates the literature reviewed. Also, results are justified due to the traditions and habits of Arabian and Islamic societies. In male-dominated societies, females have to stay for a long time at home, this saves them enough time to study leading to improved academic achievement.

The results of the current study cope with the results obtained from numerous studies (Alsarhany, 2011; Moumni & Almoumni, 2011; Hazaimah, 2011, Alzewaini & Al-lami, 2014) showing that there are statistically significant differences in textbook readability level in favor of females. However, it differs from the result of studies of Nasr & Al-ibrahimi (2013) and Dahlan (2014) that revealed the lack of differences between males and females in terms of textbook readability levels. These results may be justified as all students around the state of Kuwait from the six governorates; Assema, Hawalli, Farwaniyah, Mubarak Al-Kabeer, Ahmadi, and Jahraa, study the same textbooks. These textbooks have been written by the same authors through centralized committees. Also, students all over Kuwait are taught using the same teaching strategies, pupils adopt the same traditions and habits, they live in the same cultural environment.

6. Conclusions

Readability is a critical measure of text difficulty; it denotes the easiness with which a written text can be understood by readers from different educational backgrounds. Textbooks have been traditionally used as a container of knowledge; it is one of the main elements of the school curriculum that helps learner increase their learning to achieve their goals. As such, textbooks are subject to revising, editing, and improvement from now and then.

Readability can be assessed using different tools, one of the traditional indicators of readability is the sentence and word length. Other factors influencing readability level include the number of characters, the count of hard and complex words as well as the number of syllables in each word. Since then, several popular readability metrics have been introduced: Dale-Chall (Dale and Chall, 1948), Fog
The Cloze test represents a credible tool for assessing textbook readability levels. It is one of the quantitative methods of assessing readability that has been developed by Taylor (1953), the theoretical bases of cloze tests went back to the Gestalt theory of awareness law called closure. According to this law, language can be viewed as a complete form despite gaps. Cloze test relies on quoting a certain message from a sender (author) to a receiver (reader) through making some deleting modifications to retrieve its initial form.

Cloze test includes a text with deleted words, students are supposed to figure out the deleted words to fill in the spaces. It takes two forms; deleting all basic words in the text with no help for learners, and deleting all basic words in the text with minor guidance, i.e., writing the first letter of the deleted words. (Ambousaidy and Aleremi, 2004; Abosoleit, 2007; Ghalyoun, 2008). It helps educators to stand on the level of readability of Arabic textbooks of sixth-grade intermediate pupils in the State of Kuwait.

References

Abdul Ghani K., Noh, A. S. & Nik, N. R. (2017). Linguistics features of Arabic textbooks and their relation to levels of text readability in Malaysia. *Gema Online Journal of Language Studies*, 17 (3), 152-166.

Abosoleit, A. (2007). Readability of Biology textbook of first-year secondary school and Science textbook of ninth-year intermediate school in relation with achievement, gender, and region. *Unpublished Master’s Thesis*, San’a University, Yemen.

Abu-Leil, A. Kh., Share, D. L. and Ibrahim, R. (2014). How does speed and accuracy in reading relate to reading comprehension in Arabic? *Psicológica*, 35, 251-276.

Abu-Saleet, A.Y. (2007). The readability of 9th & 10th grade’s biology, science textbooks and their relationship with achievement, gender, and district. Available: https://dspaceju.edujo/xmlui/bitstream/handle/123456789/40121/11UJABSTRACTS6457.pdf

Al Tamimi, A-K. Jaradat, M. Al-Jarrah N. and Ghanem, S. (2013). AARI: automatic Arabic readability index. *International Arab Journal of Information Technology*, 11(4),370-378.

Al-Heeti, K. N. (1984). Judgment analysis technique applied to readability prediction of Arabic reading material. Available: http://www.worldcat.org/title/judgment-analysis-technique-applied-to-readability-prediction-of-arabic-reading-material/oclc/12071710.

Al-Khalifa, H. and Al-Ajlan, A. (2010). Automatic readability measurements of the Arabic text an exploratory study. *Arabian Journal of Science and Engineering*, 35(2),103-124.

Al-Rashidi, M. H. (2005). Level of Arabic textbook readability for the basic grade 4 in the state of Kuwait. *IEEE/ACS 12th International Conference of Computer Systems and Applications (AICCSA)*. DOI:10.1109/AICCSA.2015.7507232

Alhaj, M, Younis, F. (2016). Readability level of Arabic language textbooks of third grade primary schools in Palestine in the light of readability assessment tools. *Journal of College of Educational Sciences*, Ain Shams University.

Al-Khalifa, H. S. and Al-Ajlan, A. A. (2010). Automatic readability measurements of the Arabic text: An exploratory study. *The Arabian Journal for Science and Engineering*, 35(2C),103-124.

Alnaji, H. (1994). Evaluating “lughatonah Aljamilah” textbook of second grade primary school in Jordan from teachers’ viewpoint. *A paper presented to the 3rd Scientific Conference*, College of Education, Bahrain University.

Alsarhani, O. (2011). Readability level and engagement degree in Arabic language textbook of fourth-year primary schools in KSA. *Unpublished Master’s Thesis*, Moutah University, Jordan.

Al-Tamimi, A., Jaradat, M., Aljarrah, N., and Ghanim, S. (2014). AARI: Automatic Arabic Readability Index. *The International Arab Journal of Information Technology*, 11(4),370-379.

Alzeweni, E, Al-lami, R. (2014). Readability assessment of Oration textbooks of fifth-grade intermediate school and its relation with gender and specialization. *Journal of College of Basic Education in Humanities*, Babylon University, (16), 541-566.

Ambousaidy, A. & Aloreimi, B. (2004). Readability of Biology textbook of the first-year secondary in Oman in relation to certain variables. Kuwait University, *Educational Journal*, 19(73), 153-181.

Araj, A. (1999). *The relationship between the mental skills reflected by the readability test of Arabic texts and the achievement level of the Arabic language for the 5th grade in Bethlehem district*. Available:http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1632807
Arifin, Z., Zulazhan, A. H., Nurul Masyiah, M. S. and Azimah Shurfa, M. S. (2013). The readability of the Arabic prose text. *Middle-East Journal of Scientific Research*, 17(3), 338-343.

Begeny, J. & Greene, D. (2014). Can readability formulas be used to successfully gauge the difficulty of regarding materials? *Psychology in the Schools*, 51 (2), pp 198-215.

Cavalli-Sforza, V., Saddiki, H., & Nassiri, N., (2018). Arabic Readability Research: Current State and Future Directions. The 4th International Conference on Arabic Computational Linguistics (ACLing 2018), *Procedia Computer Sciences*, 142 (2018), 38 – 49.

Chall, J. S. (1974). *Readability: An Appraisal of Research and Application*. Cetak Ulang. Epping, Essex: Bowker Publishing Company.

Collins-Thompson, K. (2014). Computational assessment of text readability: A survey of current and future research. *International Journal of Applied Linguistics*, 165(2), 97-135.

Cote, R. (2009). Choosing one dialect for the Arabic speaking world: a status planning dilemma, *Arizona Working Papers in SLA & Teaching*, 16, 75-97.

Dahlan, O. (2014). Readability level of Arabic language textbooks of ninth-year intermediate schools in Palestine. *Najjah University Journal of Research (Basic Sciences)*, 28(12), 2877-2906.

Dale, E. and Chall, J. S. (1949). The concept of readability. *Elementary English*, 26: 23.

Dawood, B. K. (1977). *The relationship between readability and selected language variables*. Available online at: https://dspace.eduji/xmlui/bitstream/handle/123456789/50995/THESISJUNE2014_201.pdf

De Clercq, O., Hoste, V., Desmet, B., Van Oosten, P., De Cock M., and Macken, L. (2014). Using the crowd for readability prediction. *Natural Language Engineering*, (20)03,293-325.

De Vries, G. and Stern, R. (2016). Readability Classification: Combining the Power of Machine Learning and Natural Language Processing *EduTech, Technology*, Nov 14, 2016. Available Online at: // https://www.wizenoze.com/language/en/readability-classification/

DuBay, William. H. (2007). *Unlocking language: the classic readability studies*. Impact Information. Costa Mesa, California, U.S.A.

El-Haj, M. and Rayson, Paul E. (2016) OSMAN: A novel Arabic readability metric. In: *Proceedings of the Language Resources and Evaluation Conference* 2016. European Language Resources Association (ELRA), Slovenia, pp. 250-255. ISBN 9782951740891.

Forysth, J. N. (2014). Automatic Readability Detection for Modern Standard Arabic. *All Theses and Dissertations*. 3983. https://scholarsarchive.byu.edu/etd/3983

Francois T. & Miltsakaki, E. (2012). Do NLP and machine learning improve traditional readability formulas? *Proceedings of I Workshop on predicting and improving text readability for target reader populations*, Montreal, Quebec, Canada, 4-8 June 2012, 49-57.

Francois, T. and Watrin, P. (2011). On the contribution of MWE-based features to a readability formula for French as a foreign language. In *Proceedings of Recent Advances in Natural Language Processing (RANLP)*, pages 441–447. Association for Computational Linguistics.

Ghalayoun, A. (2008). The relationship between the readability of Physics textbook and scientific thinking skills of third-year secondary school. Ain Shams University, Egyptian Committee of Practical Education, *Practical Education Journal*, 1(1), 95-118.

Ghani, M. A., Zailani, S., H. J. Ahmad, H., H. J. Hashim, U. H., Shaadon, Z., & Nur Syazwina, M. (2011). Application of basic skills in reading Arabic text for teaching and learning. *Procedia - Social and Behavioral Sciences*, 59(2012) 26 – 32. Doi: 10.1016/j.sbspro.2012.09.241.

Haeri, N. (2000). Form and ideology: Arabic sociolinguistics and beyond, *Annual Review of Anthropology*, 29, 61-87.

Hancke, J., Vajjala, S., and Meurers, D. (2012). Readability classification for German using lexical, syntactic, and morphological features. In *Proceedings of the 24th International Conference on Computational Linguistics (COLING): Technical Papers*, pages 1063–1080. Association for Computational Linguistics.

Hazaimeh, S. (2011). Readability level of “lughatonah Alarabyiah” textbook of the seventh-grade school in Jordan in relation to certain variables. *International Journal of Educational Research*, UAE University, (30), 60-81.

Hofman, J. and Habib-Allah, M. (1982). The close technique in Arabic: Words or semantic units?”, *Journal of Psycholinguistic Research*, 11(4),275-282, 1982.

Hussein, W., & Gough, P.B. (1990). The simple view of reading. *Reading and Writing: An Interdisciplinary Journal*, 2, 127-160.

Husaini, M. N., Abd Rahman, M. S., Ghazali, A. R. & Abdullah, N. (2014). Readability level of the book of Al-Mursyd fi al-Lughah al-Arabiah. *International Journal of Islamic Studies and Arabic Language Education*,1(1); 11-16.

Hussain, N. H. & Mamat, M. (2019). Readability level of Arabic texts for upper primary pupils at Al-Amin Islamic Primary School (SRI). *International Journal of Mechanical Engineering and Technology (IJMET)*, 10(03),1672–1680.
Jawarnah, M. (2008). Readability level of social and civil education textbooks of fourth-grade primary schools in Jordan. *Jordanian Journal of Educational Sciences*, 4(2), 124-136.

Mahmoud, S. (2012). Readability assessment of Arabic language textbook in primary stage using computer software and teachers' perception. *International Journal of Educational Research*, UAE University, 31, 89-121.

Mekdadi, F. & Alzoughby, A. (2004). Readability of Mathematics textbooks of fifth-year primary school in Jordan. Qatar University, *Journal of Educational Research*, 25, year 13, 203-223.

Moumni, A. & Almoumni, M. (2011). Readability level of Arabic language textbooks of fourth-year primary schools in Jordan. *Journal of Moutah University*, 27(4), 558-588.

Nasr, H., Al-Ibrahimi, I. (2013). Readability level of improved "lughatonah Alarabyiah" textbook of fifth-year primary school in Jordan. *Journal of Om AlQourah University of Educational & Psychological Sciences*, 5(1), 62-90.

Orhan, C. (2015). Evaluating the Readability Levels of Elementary School Textbook Regarding Students with Learning Disabilities. *Elementary Education Online*, 14 (2), pp 671-681.

Pazzaglia, F. & Cornoldi, C. & Tressoldi, P. (1993). Learning to read: Evidence on the distinction between decoding and comprehension skills. *European Journal of Psychology of Education*, 8, 247-258. 10.1007/BF03174080.

Prfetti, C. (1985). *Reading ability*. New York: Oxford University Press.

Prins, D. E. and Uljhn, J. M. (1998). Linguistic and cultural factors in the readability of mathematics texts: The Whorfian hypothesis revisited with evidence from the South African context. *Journal of Research in Reading*, 21(28):139-159.

Saddiki, H., Cavalli-Sforza, V. & Bouzoubaa, K. (2017). Enhancing Visualization in Readability Reports for Arabic Texts. 3rd International Conference on Arabic Computational Linguistics, ACLing 2017, 5-6 November 2017, Dubai, United Arab Emirates. *Procedia Computer Science*, 117 (2017) 241-247, DOI:10.1016/j.procs.2017.10.115

Saddiki, H., Bouzoubaa, K., Violetta Cavalli-Sforza, V. (2015). Text readability for Arabic as a foreign language: What performance to expect from simple predictors? AICCSA, 1, 1-8. DOI:10.1109/AICCSA.2015.7507232.

Si, L. and Callan, J. (2001). A statistical model for scientific readability. *Proceeding of 10th International Conference on Information and Knowledge Management (CIKM)*, ACM, pp. 574-576.

Sjahrony, A., Lubis, M. A. & Yusoff, N. (2017). Importance Textbook Readability in the Education World. ASEAN Comparative Education. *Research Journal on Islam and Civilization (ACER-J)*, 1 (1) January 2017; 25-40.

Soliman, I. (2002). Readability level of Arabic language textbooks of sixth-year grade in Nablus Governorate. *Unpublished Master’s Thesis*, College of Education, Najah National University.

Stanovich, K. E. (1991). Word recognition: Changing perspectives. In R. Barr, M. L. Kamill, P.B. Mosenthal, & P. D. Pearson (Eds.), *Handbook of Reading Research*, (pp. 418-452). New York: Longman.

Zorbaz, K. & Mustafa, K. (2016). Word-sentence lengths and readability levels of texts in Gazi Tomer Turkish textbooks for foreigners. International Periodical for the Languages, *Literature, and History of Turkish*. 11 (3), pp 2509-2524.