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## THE EFFECT OF PRINTED TEXT COMPARED TO DIGITAL ON READING LITERACY AMONG 9<sup>TH</sup> AND 10<sup>TH</sup> GRADE PUPILS IN ARAB-PALESTINIAN SCHOOLS IN ISRAEL

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### Abstract

The current study examines the impact of printed text compared to digital text on reading literacy levels among 9th-10th graders in schools in Arab-Palestinian society in Israel. Various studies have shown that using digital texts increases the level of motivation for studies and positively affects the level of reading literacy (reading comprehension) among students than the use of printed texts. This is an issue that has not been studied before, especially among Arab-Palestinian society in Israel, hence the uniqueness of this study. The current study was conducted using quantitative methodology, which involved 80 teachers and 120 students from secondary schools in Arab-Palestinian society in Israel. The researchers used two questionnaires to collect data on topics related to the use of printed text compared to digital text, with the first distributed among students and the second distributed among teachers. The findings showed that among ninth graders, the average scores were higher in digital text compared to text printed at the general level. In addition, among 10th graders, the average scores were higher in digital text than in printed text. In addition, there was no significant difference between boys versus girls compared to scores in digital text versus printed text.

**Keywords:** printed text, digital text, reading literacy, reading comprehension

### 抽象的

目前的研究调查了印刷文本与数字文本相比对以色列阿拉伯-巴勒斯坦社会学校 9 至 10 年级学生阅读素养水平的影响。各种研究表明，与使用印刷文本相比，使用数字文本提高了学习动机水平，并对学生的阅读素养（阅读理解）水平产生了积极影响。这是一个以前没有研究过的问题，特别是在以色列的阿拉伯-巴勒斯坦社会中，因此本研究具有独特性。目前的研究

是使用定量方法进行的，涉及以色列阿拉伯-巴勒斯坦社会中学的 80 名教师和 120 名学生。研究人员使用了两份问卷来收集与使用印刷文本与数字文本相关的主题数据，第一个问卷分布在学生中，第二个分布在教师之间。研究结果表明，在九年级学生中，数字文本的平均分数高于一般水平的印刷文本。此外，在 10 年级学生中，数字文本的平均分数高于印刷文本。此外，与数字文本和印刷文本的分数相比，男孩和女孩之间没有显著差异。

**关键词：**印刷文本，数字文本，阅读素养，阅读理解

### **Introduction**

Reading literacy is considered as one of the most complex cognitive processes; and is the ability to understand the written linguistic forms that are required by society or that have value in the eyes of the individual. Breznitz sees that reading is a complex cognitive process, and the system processes the information gradually, the process of decoding the information requires full coordination between the system that picks up the written symbol, and the system that matches the speech sound belonging to that symbol (Breznitz, 2011). Other scholars see the learning process as a two-way process between the reader and the text and the text to the reader, with the reader linking the previous knowledge in his memory to the knowledge he reads in the text, this reading is measured by the effectiveness of the reader-text interaction (Anderson & Pearson, 1984; Tov Li & Frish, 2014).

Studies in reading literacy show that the student's ability to deal effectively with reading comprehension text is affected in several aspects: First, language characteristics that have a significant impact on how students cope with reading comprehension text, such as the difference between spoken and written language, written morphological and phonological structure as well as the orthographic complexity of the language. Second, the issue of text. That

is, the learner's coping with the reading comprehension text varies according to the type of text; The use of informational text, which is one of the most difficult types for learners, is because students are exposed to informational texts at a relatively late age, towards the beginning of middle school. Third, how the text is displayed. Reading comprehension is influenced by the way the text is presented, i.e., a printed environment versus a computerized environment (Makhoul & Copti-Mshael, 2015). A computerized environment in reading comprehension text is considered more effective due to the accessibility of the Internet, since all the information found on the Internet can help the learner and make learning more efficient. The advantage of learning in a computerized environment is that texts in this environment are richer in illustrations, handouts, videos, clues with the ability to move between pages easily, things that help and contribute to understanding the text more effectively. Moreover, digital texts accompanied by voice reading reduces the cognitive effort invested in deciphering and thus the reader concentrates only on understanding the text. New research suggests the impact of the digital environment on empowerment in learners, in that the use of computer programs for word recognition and reading contributed to improved student motivation, and the conclusion

was that motivation has a great impact on the achievements of reading and reading comprehension (Cobb, 2001; Wise, et al, 1998; Ross, 2002; Lewin, 2000; Elbro, Rasmussen & Spelling, 1996).

In light of the existing research literature on the effect of printed text compared to digital text on the level of reading literacy among students, it is interesting to investigate such an effect in the process of learning reading literacy in schools in Arab-Palestinian society in Israel. Therefore, the questions at the heart of this study are: What is the effect of the printed text compared to the digital text on the level of reading literacy among ninth- and tenth-grade students in schools in Arab-Palestinian society in Israel? Is there a difference in the literacy rate of a printed informational text compared to a digital informational text among ninth graders? Is there a difference in the literacy ability of reading printed informational text compared to digital informational text among tenth graders? Is there a difference in the literacy rate of a printed informational text among ninth-grade students compared to tenth-grade students? Is there a difference in the literacy ability of reading a digital informational text between ninth graders compared to tenth graders? Is there a gender difference in the literacy ability of reading informational text as a function of the presentation environment?

This is a pioneering study that examines in depth the effect of the printed text compared to the digital text on the level of reading literacy among ninth- and tenth-grade students in schools in Arab-Palestinian society in Israel. The importance of investigating this topic stems from various factors, including: 1. Interest in the change that is taking place in innovative teaching methods in general and the use of digital text in

reading literacy. 2. The need to examine the integration of the digital text in teaching among Arabic-speaking students, and to examine its impact on the level of reading literacy and motivation for learning.

### **Reading Literacy and Reading Comprehension**

Literacy is the ability to understand and use the written linguistic forms required by society or that have value in the eyes of the individual. Readers can derive meaning from a variety of types of texts. They read to learn, to be part of reading communities in school and daily life, and for pleasure (Rama, June 2020). Reading comprehension is one of the important skills that a learner must acquire in school. Therefore, understanding the content relies on identifying and understanding graphic units, understanding the words of which the passage is composed and the connection between them, and in order to derive a message from the text, the learner must know linguistic knowledge, world knowledge and cognitive connections (Kaplan & Ravid, 2009). Reading and writing are among the very important skills that students in a school must acquire in order to succeed in all kinds of fields. They help the student not only in school but also in future life when integrating into society and the like, without reading and writing one may lose opportunities for success in life, one is required in life to understand different types of texts, from filling out forms and more (Tov Li & Frish, 2014).

Breznitz sees that reading is a complex cognitive process, and the system processes the information gradually, the process of decoding the information requires full coordination between the system that picks up the written symbol, and the system that matches the speech

sound belonging to that symbol (Breznitz, 2011). In contrast, Smith relies in his definition on the reading process which is a top-down process. Therefore, his definition treats reading as an action that begins with the reader's knowledge and hypotheses, and ends with refuting and verifying these knowledge and hypotheses to what is written in the text while Anderson & Pearson (1984) claim that the learning process is seen as a two-way process between the reader and the text and the text to the reader, when the reader connects the previous knowledge in his memory with the knowledge he reads in the text, this reading is measured by the effectiveness of the reader-text interaction.

It is important to emphasize that the main purpose of reading is reading comprehension, fluency and accuracy in reading are necessary conditions for deciphering and understanding the text, so it is very important to have an accurate reading with an adapted pace that allows attention and comprehension. The reading comprehension process is a process that relies on several metrics, such as reading, vocabulary, syntax, meaning comprehension, and thinking skills. While reading, the reader should be active in relating to each word and build knowledge according to what he reads and address the uniqueness of the combination between the words (Nagy & Townsend, 2010). Vocabulary is very important for the connection between the reader and the text, because in order to understand the text the reader must know the vocabulary within it. Academic vocabulary in Arabic is similar to academic vocabulary in other languages, and the way they are acquired is similar to most methods known by linguists (Nagy & Townsend, 2010). Arabic vocabulary is influenced by language diglossia, so learners come up with a very small vocabulary that they

need to expand in order to understand what they read more deeply (Saiegh-Haddad, 2004).

The issue of the informational text is one of the important things that influences the extraction of meaning from it (Meyer, 1999). Each text subject has different characteristics, such as vocabulary, level of complexity and its unique structure. Informative text is a text intended to convey certain information and consists of a unique vocabulary that characterizes it (Kucan & Beck, 1997; Berman & Katzenberger, 2004). The vocabulary in the informational text is an academic vocabulary that adds difficulty in dealing with learners. More difficult to understand than other types of texts among children and adolescents (Tov Li & Frish, 2014). The informational text requires high-level skills in order to understand it correctly (Diakidoy et al, 2005). Each issue of text triggers a different cognitive process that develops at different ages. Moreover, some researchers have found that there is a close relationship between the structure of the text and how it is presented and the comprehension of the reader (Perfetti, Landi & Oakhill, 2005). Familiarity with informational texts is done in advanced stages, because children do not know what a scientific text is and what its structure is. It should be added that there is no uniform structure of the informational text, because their structure is diverse, so it makes it even more difficult for learners. Familiarity with the structure provides children with information and helps them understand the message, in addition to the characteristics of the text that have an impact on reading comprehension (Perfetti, Landi & Oakhill, 2005; Rama, June 2020). Students find it more difficult to deal effectively with information texts than other texts. This difficulty becomes more apparent when readers are required to perform other tasks that

accompany the text. Adams (1994) sees that reading accuracy is a necessary condition for proper decipherment of the text and reading comprehension is a condition not found in reading an informational text in which the fluency of reading and comprehension is impaired (Makhoul & Copti-Mshael, 2015). The findings in the research of Gal Ben-Yehuda and his colleagues regarding the comparison between reading comprehension of printed text and comprehension of digital text, indicate a slight reduction of reading comprehension in learning from digital texts. The gap in reading comprehension is to the detriment of digital media, and it increases when the time frame for learning is limited (versus free) and when the text is informative (versus narrative) (Ben-Yehuda et al, 2018). Researchers Daniel & Woody (2013) also found that reading comprehension in digital text is less good than reading comprehension in printed text.

### **The Effect of the Presentation of the Text, the Learning Environment and the Motivation on the Students**

Informative text is defined as text whose purpose is to convey knowledge in a particular field and consists of a unique vocabulary that characterizes that specific field. The vocabulary in the informational text is academic and it adds difficulty for the reader (Kucan & Beck, 1997; Berman & Katzenberger, 2004). The learning environment is a structured and designed space that the teacher chooses in order to fulfill the intended goals, while learning in a digital environment is learning in which learning is carried out by online and computerized means. According to the State Comptroller of Israel's report, the technological study environment and ICT infrastructure of post-primary schools, and

in particular of upper divisions and schools in areas with a socio-economically weak population, do not adequately provide the conditions necessary for effective acquisition of technological literacy and digital for post-primary education students (State Comptroller, 2021).

For this purpose, the learner needs cognitive and linguistic knowledge such as vocabulary, syntax, linguistic knowledge and more. In contrast reading in a digital environment readers move from place to place through links according to their preferences and goals. The development of 21<sup>st</sup> century skills, including "information literacy and" information technology and communication literacy", Such as reading and writing literacy, the use of a digital book, a learning site, computerized activities and the like, are the basis for processes to promote the digital environment for both teachers and trainees. Therefore, the education system needs to provide teachers and students with technical-digital skills in order to be able to control computer and other digital applications, in addition to examining their degree of control and use (Avidov-Ungar & Amir, 2020).

The online network allows the reader a segment of reading comprehension and an exposure to different processes of reading comprehension, i.e., the content will be presented in different forms like projected video text, plain text and the like. A computerized environment leads the student to an active learning process in which he or she has to deal with questions and issues on his or her own that he or she must locate and organize information. All of this will be realized in the computerized environment that allows the learner to use visual and audio sources of information, flip reading and more. According to e-PIRLS studies, reading comprehension tasks in

an online environment require a combination of new types of digital literacy and reading comprehension processes relevant to offline reading (Rama & June 2020). In contrast, learning in a printed environment in which a printed text is read requires several skills, such as: scanning the text, setting goals, constructing a prediction for the continuation of the text to interpret the text and building connections within the text combined with the reader's prior knowledge (Duke & Pearson, 2002; Pressley, 2000).

Using a computerized environment for reading comprehension texts can be considered more effective due to the accessibility to the Internet. All the information which can be found on the Internet can help learners and make learning more effective. The advantage of learning in a computerized environment is that texts in this environment are richer in illustrations, handouts, videos, clues with the ability to move between pages easily, things that help and contribute to understanding the text more effectively. Moreover, digital texts accompanied by voice reading reduce the cognitive effort invested in deciphering and so the reader concentrates only on understanding the text, an opportunity to correct the answer through corrective feedback and the possibility of immediate assessment by each learner (Wise, et al., 1998; Ross, 2002; Lewin, 2000; Elbro, Rasmussen & Spelling, 1996).

The work of the teacher in the school, as a teacher and educator, plays a significant and challenging role. This role involves many elements that increase the complexity of the role of the teacher in his daily work. In this way, the teacher is one of the main anchors of the education system, his position, perception and approach to the teaching method influences the existing educational

outputs among the students, and the motivation he can give to the students. Therefore, the teacher's perception regarding changing a particular method or alternatively using new teaching methods is a key cornerstone in the teacher's sense of educational endeavor.

Thus, motivation is influenced by many factors, such as the position of the teacher and students in the learning process, the degree of student involvement, fear of failure and the design of the learning environment. The role of the teacher is very important in strengthening the motivation of the learners and it comes true when the teacher believes in the student's abilities because only then can the student believe in his abilities, encourage him to give him confidence in his abilities, give him tasks as he can fulfill. If the teacher encourages students and gives them a sense of satisfaction and success, they can continue even when they fail (Davidson & O'leary, 1990; Driscoll, 1994; Mathewson, 1994).

The encouragement and treatment the student receives from the teacher affects his or her inner motivation. The teacher should take care to manage the lesson plan in a way that strengthens the motivation of the students, the teacher should plan a lesson plan where elements are interesting and attract the attention of the learners, which makes the lesson more interesting (Driscoll, 1994). New research suggests the impact of the digital environment on empowerment in learners, in that the use of computer programs for word recognition and reading contributed to improved motivation in students and the conclusion was that motivation has a great impact on reading achievement and reading comprehension (Cobb, 2001).

The transition from elementary school to middle school is a significant transition related to two

aspects: the first aspect is the personal aspect, on the one hand, the personal support is low and the social interaction between teacher and student is weaker, and on the other hand, between the student and himself. While the second aspect is heterogeneity in the learning environment and competitions in terms of academic achievement, studies argue that middle school does not meet these unique needs of adolescence. As a result, students' motivation is low and leads to low achievement. From the analysis of the curricula in middle schools in Israel, these contents will meet the special needs of students at this age but the evidence shows that middle schools do not act according to these contents but act according to high school norms that do not meet the needs of middle school students (Eddie-Rekach, Biran, & Friedman- Goldberg, 2011).

According to the education sector, 2018, it appears that the average rate of e-classrooms in state-Jewish education schools in Israel is the highest (about 61% of classes), while the rate of e-classrooms in the Arab sector is lower than the rate in the state-Jewish sector (State Comptroller, 2021). In a review by Byrne and Friedman-Goldberg, it was found that four hours a week devoted to teaching the Arabic language, which is the mother tongue (language and literature) of Arab students, raises question marks at the level of educational and pedagogical policy in this area of learning. In addition, in the Arab sector, four hours are devoted to learning the Hebrew language. It can be concluded that the transition to middle school is not an easy thing, requiring special efforts, especially among Arab society because belonging to Arab society intensifies the difficulties encountered by adolescents (Eddie-Rekach, Biran, & Friedman-Goldberg, 2011).

### **Teachers' Attitudes Towards the Digital Text**

Teachers' attitudes toward the use of digital text are related to many levels, some of which are related to the teacher and some of which are related to the organization. One of the layers that influences teachers' attitudes towards the use of digital text is the field of assimilating changes in the teaching process and educational pedagogy. Therefore, processes of assimilating organizational change in the school should be adapted to the abilities of the teachers and their status in the school, or alternatively teachers should be guided towards the trend change in their work.

Technological changes in the education system are trending at a global level, and in recent years there have been changes in education reforms in most countries of the world. In Israel, too, for several years, attempts to change and improve the educational environment and the integration of the computer and technological tools in teaching have stood out. Therefore, the increase in curricula that integrate technology as a means of promoting teaching and learning is noticeable. In light of the accelerated technological development in the first decade of the 21st century and the cultural change it has brought about, the Ministry of Education has launched a comprehensive ICT program called "Adapting the Education System to the 21st Century". This program has many goals but its main goals include leading to the existence of innovative pedagogy in schools while assimilating information and communication technology (ICT), as well as teaching and learning content, where the content and knowledge learned are relevant to the changing reality (Eisenberg & Selivansky, 2019).

In the last two decades (1994–2014), there have been about ten attempts to launch pedagogical reforms in Israel, which have sought to bring

about change, but despite the efforts, it seems that the Israeli education system is still finding it difficult to adapt to the current time. The gap was large between the stated goals and objectives of the reforms and what was actually going on in the school classrooms. Some barriers have faced the implementation of these reforms successfully or adequately, hence the difficulty of the system to change from traditional standards to a system operating in accordance with future needs. In addition, school principals and teachers do not adequately master skills for the purpose of future applications and what digitalization is, in addition to the fact that teacher training institutions do not adequately adapt to advanced teaching methods (Eisenberg & Selivansky, 2019).

In the digital realms associated with the implementation of ICT in schools, the teacher loses control of the study material, while students may also be exposed to different sources of information. Therefore, the education system needs to adapt to its basic ideas and deal with the challenges it poses. While adapting to and adjustment to the new paradigm there are both chances and risks, which need to be addressed accordingly. It is worth emphasizing that attempts to implement a worldview and basic ideas of the postmodern era in the education system may create contradictions both in setting its overarching goals and in pedagogical methods, with the starting point of the education system in the postmodern age being to preserve and pursue change (Yosifon & Shmida, 2006).

The use of the Internet as an additional information tool about what exists in textbooks and the like, conveys a change in the old curriculum and expresses the adaptation of pedagogy to the new digital age. Digital learning at this stage implements community activation

involving the intelligent use of digital communication between learners and themselves and between them and the teacher, in building collaborative knowledge through online sharing tools, and routine use of digital information accessible to any learner anytime, anywhere. The expectation is that implementing digital learning instruction will lead teachers to adopt student-centered methods, to experience authentic research processes and knowledge building independently, and to encourage collaborative activities between students (Ertmer & Ottenbreit-Leftwich, 2010).

The teacher is faced with a dilemma in integrating digital teaching, because he ostensibly loses his power and exclusivity within the classroom, but in fact his power increases in a school systemic view. Studies in the digital age see that the teacher is a key milestone in learning, and it is true that ICT affects learning itself but still teachers are affected by ICT and are supposed to make a trend change in their work. Therefore, the accelerated entry of e-tools into the education system may bring about changes in teaching, learning and thinking patterns and enable the existence of optimal pedagogy, influencing the curriculum, the teacher, the learner, the learning environment and the desired achievements (Peled & Magen-Nagar, 2012). These processes require a lot of effort on the part of the organizational system, but especially on the part of the teacher himself. Peled and Magen-Nagar's research also shows that there is great difficulty in assimilating change processes in teaching methods and their implementation in school. Attitudes, perceptions, abilities and beliefs of teachers, towards the digital environments and towards their role in teaching in these environments, are key factors influencing the actual integration of information

technologies in teaching and are an important factor in assimilating change processes in teaching methods in schools. Significant and long-term guidance, which combines relevant pedagogical advice and experience in implementing the use of technology in classrooms, may support the required perceptual change and allow teachers to adopt programs. These moves should include expanding teachers' knowledge, expanding technological-pedagogical content knowledge, ideas, skills and ways of building knowledge, technological content knowledge and how to use technology to transfer certain content knowledge for teaching purposes (Peled & Magen-Nagar, 2012).

The perception of the technological, educational and pedagogical changes of the teachers indicates the attitude of the school staff, especially teachers to the teaching process and the fundamentals of the learning process. This perception indicates a change in the role of the teacher in the process of integrating information technology in the school, this change in the perception of teachers, and the use of information technology, contributes to the educational and pedagogical work in the school. Other researchers argue that if teachers acquire professional knowledge about strategies for implementing the use of technology in the classroom, this will enable the promotion of pedagogical rationale in the classroom and allow for the design and support of teaching and learning processes (Shamir-Inbal & Kelly, 2008; Salmon, 2000).

In a modern society, digital tools that create a change of space and teaching location, combined with technological tools that create a different learning environment, create a situation of change in learning processes, and create a different educational atmosphere, mainly due to

the formation of digital learning method, which includes web-based training, online learning, web learning, learning from distance. It provides the learning content provided and the teaching methods are designed to enhance the learning of the learners in order to improve the effectiveness of the teaching or to promote personal knowledge and skills. Basically, computers and network technology and the application of digital learning cover different fields and industries, and are designed to apply to learning situations, including synchronous and asynchronous learning on the web, to break the time, location and schedule constraints, and achieve learner-centered personal learning processes (Lin, Chen & Liu, 2017; Eisenberg & Selivansky, 2019).

Studies in the field of motivation for learning are far-reaching and indicate that students who are motivated to learn challenge their teachers and increase their motivation at work, therefore, the teacher who is motivated to teach develops motivation to learn among his students. Hence aspects of teacher functioning in the learning space while implementing innovation in teaching based on digitalization develops motivational relationships between the teacher and his students. Studies have pointed to the relationship between student motivation and teacher motivation in school which is an expression of the teacher's work and is a very complex issue. Therefore, teachers who have an impact on their students are those teachers who are motivated at work (Dörnyei & Ushioda, 2011).

Many researchers note that student motivation is related to teacher status because there is an impact on the environment and external factors on human behavior. The learning environment has a decisive influence on the level of motivation in studies. That is why the school environment in general and the classroom in

particular is so important. The significant and continuous existence of education and teaching depends on the mutual willingness of the learners and the teachers, meaning that there is a relationship between them. As the environment continues to encourage and support, the child will be able to realize and fulfill the forces inherent in him (Kaplan & Ashur, 2001). On the other hand, the learning motivation characterizes the students who have a position of control and knowledge of the characteristics of their ability. The importance of learning motivation is seen among adolescents learning to predict task assessment and perseverance. Self-image and motivation for learning is expressed in learning activities to achieve learning goals and achievements (Deci & Ryan, 1985; Maehr & Zusho, 2009).

One of the important elements in the education system and related to the level of motivation of the students is the teacher himself. For the teacher to play a significant role in acquiring and developing motivation in the learning environment, the teacher must be a prominent figure, who makes his mark in the classroom, it is important to train a teacher who can organize the student's activities That he must and was compelled to do so. Mifsud (2011) claims for his part that teachers who are highly motivated at work are effective teachers, and they are the ones who motivate the students towards positive action. It is such teachers who enjoy the work and show high satisfaction from their work and role, and they are the ones who motivate motivated students who are willing to learn. Therefore, the interaction between such teachers and their students is effective and can foster quality and positive learning principles (Mifsud, 2011).

But so far, it is implied that the enterprise of promotion and reforms to improve teachers

'attitudes in the digital environment are far from achieving the planned goals, and there is no uniformity among teachers in the entire teaching system because teachers' perceptions of innovative methods are different. The hesitation in the concepts of traditional teaching and the digital literacy and innovative technologies in teaching, there are still contradictions between teachers regarding the effectiveness of the use of digital text (Eisenberg & Selivansky, 2019). On the other hand, studies indicate a tendency for students to connect more deeply to digital texts, which intensifies the learning process in it, and enables the representation of information in a variety of media such as text, image, video, widget, interactive environment, enabling feedback and evaluation; Educational information is available anywhere and anytime that enables interdisciplinary learning; Expansion of the curriculum in the book by the teacher and by the student; possibility of learning online and offline; access to the curriculum and adapt it to the students' languages (Peled & Magen-Nagar, 2012).

### **The Arabic Language and its Characteristics**

The Arabic language is one of the most difficult languages, and this is due to its characteristics that make it difficult to acquire the language. The most prominent feature of the Arabic language is the diglossia, in which two systems exist and both the spoken language (al-'Aamiyah) which is used in daily life, and the other is the literary Arabic language (al-Fusha), which is acquired through learning processes. All speakers of the Arabic language speak the vernacular (al-'Aamiyah), who acquire it instinctively over time and learn it from the immediate environment (Saiegh-Haddad, Gawi-Dekwar & Hanna-Arshid 2021; Ayari, 1996). The Arab child was exposed

to the written and literary Arabic language at a relatively late age upon entering school. Therefore, it is important for the child to be exposed to the written language even before starting school in order to develop reading and comprehension skills. Regarding the literary Arabic language not everyone can speak or know until after learning in the continuing education system, both in reading comprehension, practicing language characteristics, such as grammar, poetry literature and more (Ferguson, 1959; Abu-Rabia & Siegel, 2003). Therefore, there are gaps between spoken and literary Arabic, both in vocabulary, phonology, grammar, syntax, linguistic forms and form of expression (Ayari, 1996; Saiegh-Haddad, 2004). Due to the complexity of the diglossic phenomenon, researchers believe that the literary Arabic language is not the mother tongue of the Arabic speaker, and in fact it is considered a second language in its cognitive system (Ibrahim & Aharon-Peretz, 2005; Ibrahim, 2009; Saiegh-Haddad & Henkin-Roitfarb, 2014).

One of the most prominent gaps between the two systems of the Arabic language is the phonological gap, which allows a person to identify and distinguish between the phonemes, which are the basic phonetic units of a language. That is, the learner must distinguish between the graphic symbols that represent the small and primary sound steering wheel of the language. In light of the existence of the diglossic phenomenon, there is a phonological distance between the two systems of the Arabic language: spoken and literary (Saiegh-Haddad, 2003; 2004; 2007; Abu-Rabia, Share & Mansour, 2003). There are diglossic sounds that exist in the spoken language, with differences in their accent between different Arab communities from one geographical place to another, but these sounds

do not exist in the written literary language such as: (ذ - ظ / dh - ذ / q - ق) (Maamouri, 1998). Which constitutes a difficulty in the acquisition of the literary language or the identification in the form of the phoneme and the letters, and in accordance with these difficulties also in the acquisition of literacy in the Arabic language and in the reading of the language (Glickman, 2014).

Arabic is also an orthographically complex language, with 35 phonemes (29 Arabic letters and six vowels (3 short and 3 long), in addition to the multiplicity of diacritical marks. The Arabic script can be accompanied by movement marks (especially for beginning readers), or without movements (for advanced and skilled readers). Also, the letters are visually complex. Many letters have the same structure, and the distinction between them is made according to its position within the word or by the number of points above or below the letter (e.g: ن - ث - ت / n, th, t, b), (ع - غ / ' , gh), and (ح - خ - ج / h, kh, j) (Abd El-Minam, 1987). This visual complexity makes reading difficult and impairs reading comprehension accordingly (Eviatar, Ibrahim & Ganayim, 2004; Ibrahim, Eviatar & Aharon-Peretz, 2007). Another problem is also the vocabulary used in everyday life is not fully compatible with the vocabulary used in textbooks. In addition, studies around the world done on different languages show the effects that phonology and morphology have on vocabulary (Makhoul & Olshtain, 2018).

Another difficulty of Arabic is that it is considered a morphologically non-linear intertwined language, with morphology divided into two parts: cutting morphology, inclined morphology, cutting morphology: the root of the word expresses basic meaning to the word and any weight is made up of other consonants and vowels. A collection of studies in Arabic

indicates the important contribution of morphology to reading, and its ability to distinguish between skilled and weak readers (Abu-Rabia, Share & Mansour, 2003; Al Ghanem & Kearns, 2014). Whereas with regard to syntax, despite the fact that the Arabic language is inflected language, and the syntactic functions of words are embedded morphologically, the order of words within the sentence is still important (Al Ghanem & Kearns, 2014; Saiegh-Haddad & Henkin-Roitfarb, 2014). Sometimes, one word may contain information that is equivalent to a complete sentence in other languages, such as (*sa'altukum* / "سألتكم" (I have asked you).

### **The Status of the Arabic Language as a Minority Language in Israel**

Since the Arabic language is used by the Arab-Palestinian society in Israel, both spoken and literary, this adds another problem despite being a minority language that is under different political and social conditions. The Arabic language was the original language from its inception until the establishment of the State of Israel in 1948, and since then the Hebrew language has become the official and primary language, while the Arabic language has become a secondary and marginal language for the Palestinian Arab minority. As a result, the Arabic language ceased to play a role in the public and official space. At the national level in Israel, the Arabic language is recognized, but the Hebrew language is considered in Israeli law and higher education as the official and useful language, although the Israeli education system provides Arab schools with mother tongue learning in the initial stages until graduation. The official policy of the ruling establishment was not limited to increasing the margins of the Arabic language,

but many attempts were made to remove its official character in Israel. These attempts continued, until the enactment of the Nationality Law, "Basic Law: Israel - The Nation State of the Jewish People", on July 18, 2018, which includes section 4 dealing with the abolition of the official status of the Arabic language. Thus, the Hebrew language became the state language officially and constitutionally, and the Arabic language became outlawed, with only a special status in Israel (Adalah, 16 July 2018)

Researcher Amara and various researchers believe that there are a number of challenges that adversely affect the status of the Arabic language in Israel, the most important of which are: Arabic became the minority language, then another challenge is the hegemony of the Hebrew language in Israeli public space following the highest policy and globalization (Amara, 2019). Therefore, it seems that the Arabic language in Israel has enjoyed an official status as the Hebrew language, but at the level of application and use of the Arabic language in public and official life in Israeli society there is almost none. Thus, the Hebrew language dominated the public space and even influenced the status of the Arabic language in the Palestinian Arab community in Israel, because it is the dominant language in the workplace, the language of communication with public institutions, the language of higher education and public, written and electronic media (Saban & Amara, 2002; Harel-Shalev, 2005; Harel-Shalev, Dec. 2006; Harel-Shalev, 2010).

Regarding "ethno-linguistic vitality" in Israel, various researchers suggest three main variables that affect the status of the ethnic minority language in the long run: The status factors of the Arabic language in Israel were influenced by several factors, the most important of which are

economic factors, social factors and symbolic status of the language. The economic status is an essential factor for the language, because the Arab-Palestinians in Israel constitute a native and national minority, and most of them have a lower socio-economic minority below the average level of the Jewish population. Therefore, most Arabs were associated with Jews in various fields of work as workers in Jewish facilities, industry, commerce and construction, and some even worked in the police and military departments, as this affected extended family ties, strengthened their privacy, and also influenced the children of the small family in conversation in Arabic among them. Thus, the vitality of the Arabic language is linked to the demographic variables between the new and young generations and the number of speakers of the language. As for the symbolic status of the Arabic language in Israel, conspicuous contradictions arise from it, since Arabic is used alongside the Hebrew language as an official language in Arab institutions, educational and cultural facilities. But, despite being recognized as an official language for the Arab-Palestinian minority in Israel, it does not enjoy a high place in curricula, education and official documents and transactions due to its relationship with top state institutions and government decision-makers (Amara, 2019; Saban & Amara, 2002).

Although the status and vitality of the Arabic language in Israel are considered low to average, the Arabs consider the language an important component of their national identity. Researcher Amara concludes in his study of the status of the Arabic language in Israel that the Arab-Palestinians have adopted the strategy of linguistic integration in order to adapt to the control of the Hebrew language and the existing political situation instead of linguistic

disintegration. On the one hand, the Arab-Palestinians in Israel try to acquire high socio-linguistic abilities in the Hebrew language for a number of purposes, including easy communication and management of their affairs on the wider social network, and on the other, they preserve their Arab-Palestinian identity, by preserving their local Arabic whenever possible (Amara, 2019).

Various studies have found that during the stages of Arab education in Israel, the Arab education systems are discriminated against in the number of weekly hours per class in connection with the teaching of the mother tongue (Arabic), while Jewish and state-religious education are preferred. therefore, the problem that adds to Arab education in general, is the supreme policy, which is expressed in budgets, number of school hours, number of students in a class, in relation to the number of teachers and number of students in school, etc., and is not differentially distributed in Jewish society (State Comptroller, 2021). All this, despite the budget plans in recent years to improve the situation in Arab education in Israel, shows that there are still gaps between the two education systems, both in the budgets and in the achievements of Arab education students in the national and international tests (Hadad Haj-Yahya, et al. 2021; Weisblai & Weininger, 2015).

In light of the above, the poor state of the Arabic language in Israel directly affects the level of literacy and reading comprehension among Arab students in the education system. This is reflected in the low achievement of students, both in the national tests such as the Meitzav and Bagrut (matriculation tests), and also in the international tests such as the PISA tests conducted by the OECD, which are held every three years. Israel's achievements in general in the PISA tests were

below the general average of the participating countries. Particularly striking is also the poor achievement of Arab students in Israel to a large extent (Nasser-Abu Alhija, 2021; Hadad Haj-Yahya, et al., 2021).

The National Measurement and Evaluation Authority (RAMA) and the Israeli media published in astonishment the low achievements of Israel in the 2018 PISA test, which examined the three areas of literacy (science, reading and mathematics) among 15-year-old students (ninth-tenth grades), with an emphasis on the field of reading literacy (Rama, Dec. 2019). Also on the skills of the adult population, shows that Israel is below the OECD average in reading and math skills, with the Arabs' score even lower. According to an international survey of graduates in problem solving in a digital environment and reading comprehension, using digital technology, the average score of Arabs is significantly lower than that of Jews. The results of the tests in the various skills indicate a significant gap to the detriment of the Arab population in Israel. The gap between Jews and Arabs in literacy is 39 points. The average of the Arabs in all three areas is very low compared to the average, in reading literacy, in mathematical literacy and also in problem solving in an electronic environment (Margalit, 28.06.2016).

According to data from the 2018 PISA test, the achievements of Jewish students are very similar to those of students in developed countries, compared to Arab students in Israel whose achievements are closer to those in more backward countries. However, Arab students are in 73<sup>rd</sup> place out of 77 countries, and in science the situation is even worse: Arab students are in 74th place. The results also showed that in all three subjects, large and significant gaps were recorded between Hebrew and Arabic speakers,

and between students from strong economic backgrounds and economically weak students. Another worrying statistic is that in the three areas the gap between outstanding students and those who have difficulty is one of the largest in the world, and the largest among OECD countries, and this is more pronounced among Arabic-speaking students of the same age group. The previous Minister of Education, Rafi Peretz, announced that following the findings, a team will be set up to examine the gaps and prepare a plan to strengthen education in Arab society. Late Education Ministry Director General Shmuel Aboav said that "the work team will turn every stone, examine the curricula, the efficiency of resource allocation, and how the thousands of cultivation hours provided are used" (Rama, Dec. 2019; Shahar, 03.12.2019).

But in light of these findings of Pisa, and the years-long policy of neglect and discrimination of the Israeli authorities and the high political echelon, the question arises: Why was there such a long neglect of Arab education in Israel? Due to the published reports and the internal and external audit on the results of the PISA tests and the ongoing situation, is it possible to correct in the short term, promote Arab education, and improve student achievement? Or do we need a consistent and long-term plan, with fairness and equality between the two Arab and Hebrew education systems?

### **Methodology**

#### **Research Method**

The study was based on the quantitative research paradigm.

#### **Research Sample**

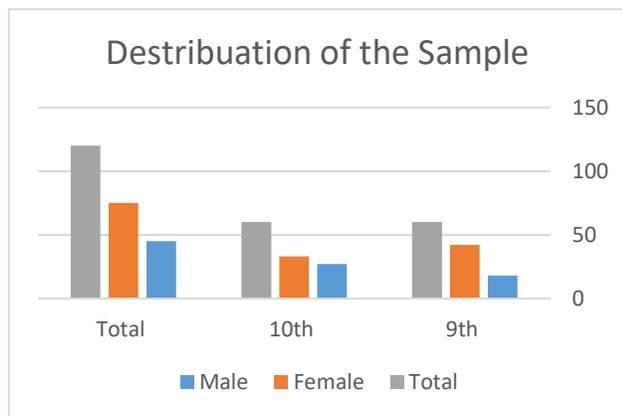
The present study included two samples, the first sample included 120 students, according to the following division: 60 ninth grade students (45

girls and 15 boys) and 60 tenth grade students (33 girls and 27 boys), the mother tongue of the students is Arabic. It should be noted that the students were randomly selected from both ninth and tenth grades with reference to the heterogeneous level of achievement. Students were asked to complete two reading literacy assignments from the PISA test, one assignment was printed and the other was digital, the two study units spoke on the same topic.

The second sample included 80 teachers from schools in Arab society. The age range of teachers between the years 31-55, by gender 18% of the sample teachers and 82% teachers, in terms of the seniority of the teachers, the seniority range is between the years 5-33 ( $M = 16$ ,  $SD = 6.5$ ). In terms of level of education, it appears that 56% with a bachelor's degree and 44% with a master's degree.

**Table 1: Table of gender frequencies and classes of study participants**

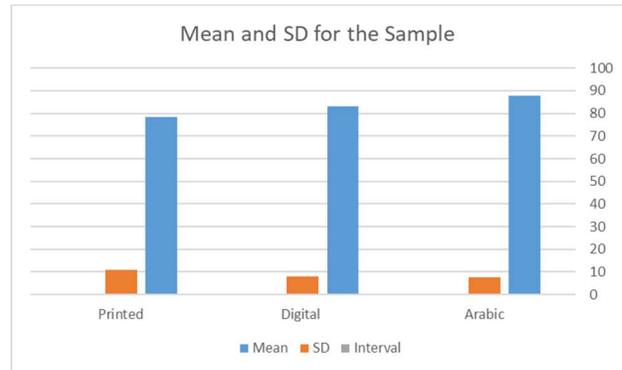
Gender	Total	Female	Male
<b>Class</b>			
9 <sup>th</sup>	60	42	18
10 <sup>th</sup>	60	33	27
<b>Total</b>	<b>120</b>	<b>75</b>	<b>45</b>



**Figure 1: Sample distribution**

**Table 2: Standard deviations, range and average scores of the participants in Arabic, in a digital test and in a printed test**

	Interval	SD	Mean
<b>Arabic</b>	73-100	7.65	87.95
<b>Digital</b>	66-96	8.03	83.24
<b>Printed</b>	46.91-97.94	10.95	78.49



**Figure 2: Averages and standard deviation for student participants in Arabic**

**Research tool**

In the present study, we used reading literacy tasks from the PISA tests, in each task the text was presented followed by reading comprehension questions, which relate to the four levels of comprehension: verbal, interpretive, implicit and linguistic knowledge. The questions included multiple-choice closed-ended and open-ended comprehension questions. The scores were calculated on a scale of 100 points.

**Questionnaire for examining the level of academic motivation:**

A questionnaire includes 12 statements, on a Likert scale from 1 (not at all) to 6 (to a very large extent). The questionnaire examines the level of motivation of learners and preference for the work environment - printed versus digital - in texts of reading comprehension

(Shumer, 2014). The questionnaire was handed out to the students. Each student filled out the questionnaire according to his preferences for dealing with the unit in one environment or another. The last part of the questionnaire was a position questionnaire for teachers, this question was constructed for the purposes of the present study which includes 12 statements. On a Likert scale from 1 (not at all) to 6 (to a very large extent). The questionnaire examines teachers' attitudes towards the use of digital informational text. The level of reliability of the questions represented in Alpha Kronbach is  $\alpha = 0.79$ .

**Findings**

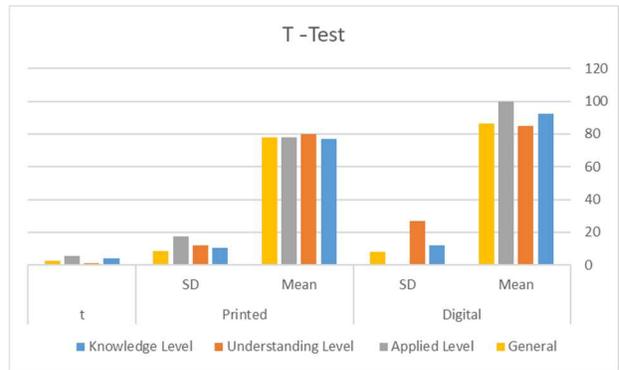
The main research question is: What is the effect of the printed text compared to the digital on the level of reading literacy among ninth- and tenth-grade students in schools in Arab-Palestinian society in Israel?

With regard to the first question: Is there a difference in the literacy ability of reading printed textual text compared to digital informational text among ninth graders?

**Table 3: T-test to examine differences in the different levels between reading literacy scores of printed informational texts versus digital informational text among ninth graders**

	<i>p</i>	<i>t</i>	Printed		Digital	
			S D	Me an	S D	Mea n
<b>Knowledge Level</b>	0.001	4.08	10.4	76.8	12.9	92.5
<b>Understanding Level</b>	0.369	0.92	12.2	80.1	27.6	85.0
<b>Level</b>			2		4	

<b>Applied Level</b>	0.00	5.69	17.9	77.7	0	100.00
<b>High thinking Level</b>			-	-	-	-
<b>General</b>	0.014	2.71	8.70	78.0	8.25	86.20



**Figure 3: T-test to examine differences in the different levels between reading literacy scores of printed informational text versus digital informational text among ninth-grade students**

As can be seen from the table above, which is based on the analysis of the first hypothesis, which states that there is a difference in the literacy ability of reading printed text compared to digital informational text among ninth-grade students. So that the performance of ninth-graders in digital informational text will be better, compared to printed informational text.

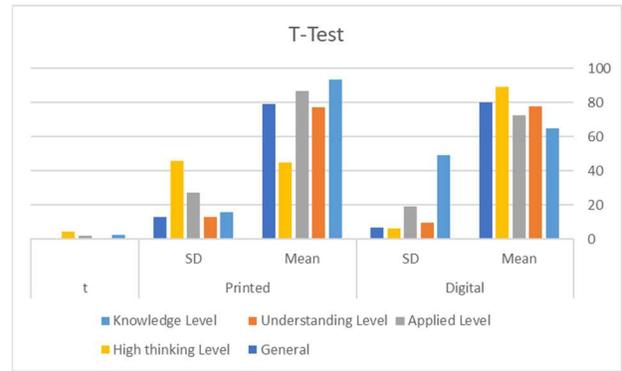
A t-test was performed to compare the reading literacy scores of printed informational texts versus digital informational text among ninth graders, the findings showed that there is a general difference and a difference at all levels except the level of comprehension. The grade point averages were higher in the digital text compared to the text printed at the general level

(M (Digital) = 86.20, M (Printed) = 78.01), Comprehension level (M (Digital) = 92.50, M (Printed) = 76.88) and Application level (M (Digital) = 100, M (Printed) = 77.76 ), signify D = Digital, P = Printed.

With regard to the second question: Is there a difference in the literacy ability of reading printed text compared to digital informational text among tenth graders?

**Table 4: T-test to examine differences in the different levels between reading literacy scores of printed informational texts versus digital informational text among tenth-grade students**

	<i>p</i>	<i>t</i>	Printed		Digital	
			SD	Me	S	Me
				an	D	an
<b>Knowl dge Level</b>	0.0 36	2.2 5	15. 97	93. 27	48 9.	65. 00
<b>Underst anding Level</b>	0.9 63	0.0 47	13. 11	77. 42	9. 46	77. 62
<b>Applied Level</b>	0.0 74	1.8 9	27. 36	86. 67	19 0.	72. 63
<b>High thinking Level</b>	0.0 00	4.4 9	45. 59	45. 00	6. 38	89. 37
<b>General</b>	0.7 29	0.3 5	13. 03	78. 97	6. 77	80. 28



**Figure 4: T-test to examine differences in the different levels between reading literacy scores of printed informational text versus digital informational text among tenth-grade students**

As can be seen from the table above, which is based on the analysis of the second hypothesis, which states that there is a difference in the literacy ability of reading printed text compared to digital informational text among tenth-grade students. So that the performance of tenth-grade students in digital informational text will be better, compared to printed informational text.

A t-test was performed to compare the reading comprehension scores of printed informational text versus digital informational text among tenth-grade students, the findings showed that there is only a significant difference in the level of knowledge and the high levels of thinking only.

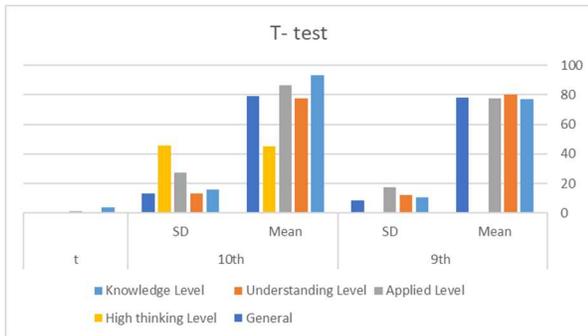
The average scores were higher in the digital text compared to the printed text at the high thinking level (M (D) = 89.37, M (P) = 45), however the scores were higher in the printed text compared to the digital at the knowledge level (M (D) = 65, M (P) = 93.27).

The third question - is there a difference in the reading ability of a printed informational text between ninth grade students compared to tenth grade students?

**Table 5: T-test to examine differences in printed text scores at the different levels**

**between ninth-grade students and tenth-grade students**

<i>Printed</i>	<i>p</i>	<i>t</i>	10 <sup>th</sup>		9 <sup>th</sup>	
			S D	Me an	S D	Me an
<b>Knowled ge Level</b>	0.0 00	3.8 4	15 9.	93. 27	10 4.	76. 88
<b>Underst anding Level</b>	0.4 99	0.6 8	13 1.	77. 42	12 2.	80. 16
<b>Applied Level</b>	0.2 28	1.2 3	27 3.	86. 67	17 4.	77. 76
<b>High thinking Level</b>	-	-	45 5.	45. 00	-	-
<b>General</b>	0.7 87	0.2 7	13 0.	78. 97	8. 70	78. 01



**Figure 5: T-test to examine differences in printed text scores at the different levels between ninth-grade students and tenth-grade students**

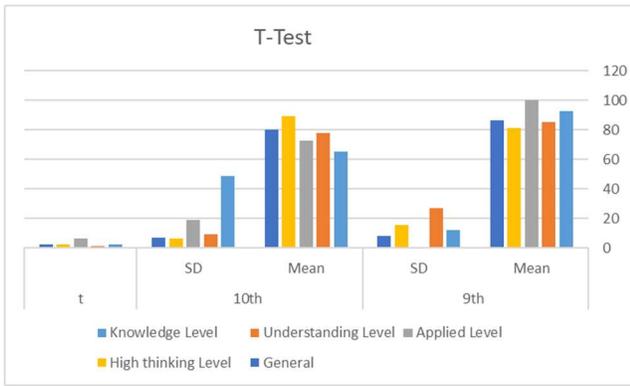
As can be seen from the table above, which is based on the analysis of the hypothesis that there is a difference in the literacy ability of reading printed informational text between tenth-grade students compared to ninth-grade students. So

that the literacy of a printed informational text will be better among tenth graders, compared to ninth graders. A t-test was performed to examine the differences in printed text scores at the different levels between ninth graders and tenth graders. It was found that there was a significant difference only in the level of knowledge so that 10th grade scores (M = 93.27) were higher than ninth grade scores (M = 76.88).

The fourth question - is there a difference in the literacy ability of reading digital informational text between ninth graders compared to tenth graders?

**Table 6: T-test to examine differences in digital text scores at the different levels between ninth grade and tenth grade students**

<i>Digital</i>	<i>p</i>	<i>t</i>	10 <sup>th</sup>		9 <sup>th</sup>	
			S D	Me an	S D	Mea n
<b>Knowled ge Level</b>	0.0 24	2.4 3	48 9.	65. 00	12 1.	92.5 0
<b>Underst anding Level</b>	0.2 62	1.1 5	9. 46	77. 62	27 1.	85.0 0
<b>Applied Level</b>	0.0 00	6.4 2	19 0.	72. 63	0 00	100. 00
<b>High thinking Level</b>	0.0 41	2.1 5	6. 38	89. 37	15 2.	81.4 0
<b>General</b>	0.0 18	2.4 8	6. 77	80. 28	8. 25	86.2 0



**Figure 6: T-test to examine differences in digital text scores at the different levels between ninth-grade students and tenth-grade students**

As can be seen from the table above, which is based on an analysis of the hypothesis that there is a difference in the literacy ability of reading a digital informational text between tenth-grade students compared to ninth-grade students. So that the literacy ability of reading digital informational text will be better among ninth graders, compared to tenth graders.

A t-test was performed to examine the differences in digital text scores at the different levels between ninth graders and tenth graders. It was found that there was a significant difference in the level of knowledge so that the grades of ninth grade (M (9th) = 92.50) were higher than the grades of tenth grade (M (10th) = 65), in the level of application (M (9th) = 100, M (10th) = 72.63), at high thinking levels (M (9th) = 81.40, M (10th) = 89.37) and overall score (M (9th) = 86.20, M (10th) = 80.28).

The fifth question - is there a gender difference in the literacy ability of reading an informative text as a function of the presentation environment?

As can be seen from the table above based on the analysis of the hypothesis that there is a gender difference in the literacy ability to read informative text as a function of the presentation

environment. In order to test the gender difference in literacy reading ability as a function of the presentation environment a t test was performed, it was found that there is no significant difference between boys (M = 9.51, SD = 19.91) and girls (M = 3.91, SD = 20.63) in relation to scores in digital text Compared to printed text (t (119) = 0.84, p = 0.405).

**Additional tests**

Do reading literacy scores predict the scores on a digital / printed test?

**Table 7: Simple linear regression to test the prediction relationship of Arabic scores to scores in the digital text and printed text test**

	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
<b>Gene</b>	-	0.	-	1	0.
<b>ral</b>	<b>0.2</b>	1	0.	.	1
<b>score</b>	<b>21</b>	6	2	3	9
<b>(digi</b>		7	1	3	2
<b>tal)</b>			1		
<b>Gene</b>	<b>0.3</b>	0.	0.	1	0.
<b>ral</b>	<b>22</b>	2	2	.	1
<b>score</b>		2	2	4	6
<b>(Prin</b>		6	5	2	3
<b>ted)</b>					

To examine the predictive relationship between the reading literacy score and the scores of the digital text and printed text test, a linear regression was performed for each of the variables, and it was found that there was no predictive relationship of the reading literacy score to the scores in the digital text or printed text test (Table 5).

**Questionnaire analysis**

T-test was performed to test the difference between the students' average answers to the questionnaire in items relating to the digital text and the items relating to the printed text (Table

4), It was found that there was a significant difference between the answers so that the students responded more positively to the test of the digital text ( $M = 5.28$ ) compared to the test in the printed text ( $M = 3.55$ ).

Another test was conducted to examine teachers' attitudes toward the use of informational text in the classroom. The findings of the statistical analysis revealed that the average of the questionnaire that examined the teachers' positions was 3.7 out of a maximum value equal to 5 to a minimum value equal to 1. This means that the teachers' position is positive with respect to the use of digital informational text.

### **Discussion**

The first study hypothesis was that there is a difference in the reading literacy level of printed informational text compared to digital informational text among ninth graders. Therefore, the performance of ninth-graders in digital informational text will be better, compared to printed informational text. It was found that there is a general difference and a difference in the level of knowledge, comprehension and high levels of thinking in the level of literacy reading of printed informational text compared to digital informational text among ninth graders. The findings showed that at these levels the mean scores in comprehension of the digital text were significantly higher than the scores of comprehensions of the printed text, thus confirming the first hypothesis.

The second hypothesis was that there was a difference in the reading literacy level of printed informational text compared to digital informational text among tenth-grade students. Therefore, the performance of tenth-grade students in digital informational text will be better, compared to printed informational text. The findings showed only a significant

difference in terms of knowledge and high levels of thinking only. however, here it was found that at the level of knowledge the scores were higher in understanding the printed text than the digital ( $M (D) = 65$ ,  $M (P) = 93.27$ ). Hence, the hypothesis was partially confirmed.

In order to explain the differences between the two ninth-tenth grades and the reasons for this, we need to look at many aspects that shape the student's understanding and approach to learning and solution. According to (Eisenberg & Selivansky, 2019) in the process of reading comprehension of a printed text the learner needs cognitive and linguistic knowledge such as vocabulary, syntax, meta-linguistic knowledge and the whole. Learning in a printed environment that reads a printed text requires several skills such as: scanning the text, setting goals, constructing a prediction for the continuation of the text to interpret the text and building connections within the text combined with the reader's prior knowledge (Duke & Pearson, 2002; Pressley, 2000).

In contrast, a digital environment allows the learner to use visual and audio sources of information, flipping reading and more (Ben-Yehudah et al, 2018). In reading using a digital environment the reader moves from place to place through links according to his preferences and goals through online network communication from anywhere and anytime, this allows the reader to be exposed to different processes of reading comprehension, with content presented in different forms (Eisenberg & Selivansky, 2019).

It has been argued that the findings can be attributed to the fact that texts in a digital environment are richer in illustrations, videos, clues and the possibility to move between pages easily, and thus these things help and contribute

to the understanding of the text more effectively. These findings are consistent with the findings of (Hartas & Moseley, 1993; Elbro, Rasmussen & Spelling, 1996), who indicated that digital texts are accompanied by voice reading, which reduces the cognitive effort invested in deciphering the text and thus the reader concentrates only on the text comprehension process. To correct the answer through corrective feedback and the possibility of immediate assessment by each learner. Another benefit to the digital environment is that reading comprehension is more effective due to the accessibility of the Internet, and because all the information found on the Internet can help the learner and make learning more effective. Other researchers, such as (Cobb, 2001; Roth & Beck, 1997) have argued that motivation has a profound effect on reading achievement and that the use of computer programs for word recognition and reading has contributed to improved student motivation.

Finally, while the digital environment has been found to contribute to raising achievement among ninth graders, it negatively affects tenth grade reading ability. The findings may be influenced by individual differences in the study population and it may be that ninth graders are more concerned about their achievements because of moving to upper division and fear of failure and therefore, they invest more time compared to tenth grade students who are in upper division.

The third research hypothesis was that there was a difference in the reading literacy level of printed informational text between ninth-grade students compared to tenth-grade students. Thus, the literacy level of reading printed informational text will be better among tenth graders, compared to ninth graders.

The fourth research hypothesis was that there was a difference in the level of literacy reading of a digital informational text between ninth-grade students compared to tenth-grade students. So that the reading literacy level of digital informational text will be better among tenth graders, compared to ninth graders.

The findings showed that in understanding digital text, significant differences were found between classroom scores at each of the high levels of knowledge, application, and thinking levels and overall score. The grade point average was higher in the ninth grade in the levels of knowledge, application and overall grade. On the other hand, the grade point average of 10th grade was higher in the higher levels of thinking. Regarding the findings of Hypotheses 3-4 it is not possible to reach a single interpretation or draw conclusions based on the data collected because the two populations are different and have studied in different environments. According to (Eddie-Rekach, Biran & Friedman-Goldberg, 2011) the transition from elementary school to high school is a significant transition related to two aspects: the personal aspect that on the one hand has little personal support and the social interaction between teachers and students is weak, and on the other hand between the student and the self. Additionally, the second aspect is the heterogeneity in the learning environment and the competitions in terms of academic achievement, as a result of which there may be a difference between ninth grade and tenth grade because the transition affects more students who have moved to ninth grade.

As for the fifth hypothesis, the claim that there is a gender difference in the reading literacy level of informational text as a function of the presentation environment was examined, and it was found that there is no significant difference

between boys and girls in relation to scores in digital text compared to printed text.

With respect to the research comment relating to teachers' attitudes regarding the use of digital information text in teaching, two layers arise, as befit the previous studies relating to the use of digitalization in teaching. The first layer of research findings in the context of this hypothesis relates to the desire of teachers to use tools and teaching methods since it has received a strong position from teachers and the second tier refers to the desired state of teachers who have difficulty using these tools. The use of digital text by teachers is the basis for creating an alternative teaching based on technological elements different from traditional teaching, how it was carried out and how the transition took place. This finding is consistent with the findings of Ertmer & others (Ertmer & Ottenbreit-Leftwich, 2010; State Comptroller, 2021), who argued that these processes should be based on prior knowledge and intelligent use of it is expected that the implementation of digital learning instruction will lead teachers to adopt student-centered methods, experiment with authentic research processes and build knowledge independently and in addition, encourage collaborative activities between students. This result rises sharply and seriously in the research findings, but there is a stage of preparation and operation of this system that is not sufficiently clear, which was very prominent in the current research findings. In addition, the significance of classroom interaction following the application of this teaching method is clearly evident, which current research raises as positive elements that promote learning in which technological capabilities enable many opportunities for innovative socio-constructivist learning, involving students and active partners in the

learning process (Magen-Nagar, Rotem, Inbal-Shamir & Dayan, 2014).

### Summary and Conclusions

The findings of the study clearly indicate the importance of educational digitization, when there are advantages to this systematicity in two main layers: The first layer, is the internalization of the study material in a more realistic and meaningful way than the traditional methods known. in addition, the second layer refers to the added value and cognitive incentive to use digital methods to promote thinking. Thus, there is a challenge for teachers, in which they are supposed to cultivate education in a digital way and with integrative thinking.

The findings of the present study are a tool for an intervention program based on education, and an applied tool for teachers in schools, which has the power to give teachers a tool for a deeper understanding of how thinking develops for students.

However, one should be aware that one of the main goals of the learning process is to empower the student and connect him or her to the desired learning platform, in order to advance the thought processes. In this context, the teacher must recognize the levels of thinking among the students in order to adapt the teaching while realizing a number of important goals that include recognizing and assimilating concepts in the chosen field of knowledge, improving the accuracy skill and understanding its importance; imparting habits and skills in understanding instructions based on digital tools.

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