# Digital storytelling for improving critical reading skills, critical thinking skills, and self-regulated learning skills

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**Abstract:**

The present study explored the impact of online Digital Storytelling (DTS) on developing critical reading skills, critical thinking and self-regulated learning skills of prospective teachers of Arabic. To reach such ends, a standardized pre-posttest in critical reading skills, critical thinking skills scale and self-rating scale of self-regulated learning questionnaire were used. The quasi-experimental research design has been used in the current research. The results of two independent sample *t*-test revealed that the critical reading skills, critical thinking skills, and self-regulated skills improved significantly in comparison to the control group. It is, therefore, recommended that blended learning should be thought of as a good match for students from communities with poor digital literacy and technology infrastructure. In addition, online learning should be used with care to cope with community needs to fill a real gap in-field practice in language learning to improve multiliteracy skills.

Keywords**:** digital storytelling, critical reading skills; critical thinking skills; self-regulated learning skills; prospective teachers of Arabic

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**Introduction:**

Reading has been extensively studied in the field of language research. Some of the reading comprehension studies, such as Pressley (2002), specifically focused on critical reading and thinking skills. Wolters, Pintrich, & Karabenick, (2005) argue that critical readers have been identified as being able to easily switch to the most appropriate reading skills, especially the most difficult ones, as required by the situation. Cognitive and mental skills are crucial to the development of effective, active, and interactive reading (Anderson, 2003; Grabe and Stoller, 2002). According to Anderson (2003), Crystal (2007), reading is an active and fluent process that involves both the reader and the reading material in a journey of constructing the meaning. Thus, the reading process crucially involves appreciating the meaning of what is written, people we read for meaning. Given that reading is a process of meaning formation, during the reading process, information from visual, semantic, conceptual, and linguistic sources is combined in such a way as to make it possible to figure out the sense of sentences and phrases.

Reading is an integral and fundamental academic skill that is required for postgraduate studies so that students can develop a deeper understanding of the research topic. According to Sengupta (2002, p. 2), academic reading is appropriate and students need to undertake "critical reading of several lengthy academic texts to complete the study of specific major subjects." A fluent reader must therefore be able to "recognize word forms, graphic form and phonological information, activate appropriate semantic and syntactic resources, recognize morphological affixing in more complex word forms, and access his or her mental lexicon" (Grabe 2009, p. 27).

Dreyer and Nel (2003) note that many underprepared students underestimate the challenge of meeting academic reading requirements when pursuing postgraduate studies. Instead, they rely heavily on summaries and, with limited critical reading skills, are bound to face challenges on their academic journey. Spack (1993) points out that in academic reading, students need to actively engage with the text and apply critical reading strategies to understand and interpret deeper meaning within the text and evaluate the relevance of texts to their study. Critical reading involves not only construction but also critical thinking. Both critical reading and critical thinking are closely linked because we can hardly read critically without thinking critically (Medina & Pilonieta 2006, Mayfield 2014, Lee 2015).

Critical reading and thinking are key to academic achievement in higher education and the development of critical thinking skills among students is seen as a very important educational goal in many societies around the world (Zin et al. 2014, Davies & Barnett 2015, Wilson 2016, Stupplea et al. 2017, Larsson 2017, Khamkhong 2018). Critical reading requires readers to go beyond the literal and interpretive comprehension of reading texts. Readers need to judge the authenticity of the ideas expressed in the writings by the writers. They do not necessarily agree with the opinions of the authors in the text for granted. It is because critical reading refers to reading the passage skeptically and analytically, and then assessing the value of the version (Douglas, 2000).

Critical reading skills contribute to the development of skills such as scientific and critical thinking. In this context, the importance of individuals with critical reading skills is not ignored in building a society where people are reading, thinking, critic, questioning, and writing (Güneş and Güneş 2014). In critical reading, readers are careful, engaged, reflective, and analytical, having a dialogue with the writer through the text to be read. With the skills acquired in critical reading instruction, students are expected to be adjudicative readers. They are required to synthesize, evaluate, interpret and selectively use the information in the texts they read to help them become successful students in this digital age (Walz 2001).

Both undergraduates and postgraduates often require a variety of abilities for academic reading. Students need the ability to select appropriate materials and critically read and evaluate them for use in their postgraduate projects. Critical reading is often seen as a three-stage process that requires learners

to understand, question, and assess reading materials (Kress 2010; Kaur 2013). Several studies have also been carried out to enhance or develop the critical reading capacity of students (Alqatanani, 2017; Khodary & Abdallah, 2014; Ellozy & Mustafa, 2010; Camp & Camp, 2013; Tsai et al., 2013; and Tomasek, 2009). Such studies have shown that when students are exposed to certain things, Suitable strategies, activities, or types of text, such as using a critical approach to literacy, multiple intelligence programs (Sultan et al., 2017), (Alqatanani, 2017), Model WebQuest (Khodary & Abdallah, 2014), Using e-maps, using content reading (Ellozy & Mustafa, 2010), Assignment (Camp & Camp, 2013), using texts from science news (Tsai et al, 2013), and they tend to use reading prompts (Tomasek, 2009), Have greater skills for critical reading.

Digital storytelling is another teaching approach for developing critical reading skills, advances in technology increase the potential use of digital storytelling instead of the traditional storytelling used mainly for entertainment and for preaching. Digital Storytelling (DST hereafter) constitutes an evolutionary form of traditional storytelling and includes the digital investment of personal narratives, to convey meanings and feelings to an audience with the immediacy and multimodality provided by modern multimedia (Robin, 2008). DTS is an evolution of aged traditional storytelling, it depends on harnessing the power of stories in passing on wisdom and knowledge via the fruit of modernity and technology (Kuan, Shiratuddin, and Harun, 2012).

Designing and implementing DTS ensures personalized learning opportunities s learners have the opportunity to present their experiences, reflections, as well as evaluate their achievement (Van Gils, 2005). It is worth noting that personalized learning experiences and students' ownership of their learning increase their sense of independence and self-confidence (Hargreaves, 2005). Improved sense of self-confidence is transferred to students' professional life later on (Ohler, 2008), to help learners to apply their knowledge and skills to new environments (Clarke & Mile, 2003). Personalized learning experiences offered through digital storytelling allow learners to use different narratives and characters with a great amount of freedom to modify events, they can use their imagination, ideas, and opinions to re-create the story (Smeda, Dakich & Sharda, 2014).

Given that DTS increases students' personalized learning experiences, students' ownership of their learning, their sense of independence, and students' self-confidence, it helps develop self-regulated skills. Self-regulation refers to the learning process, which is the product of the cognitive control of students and their accomplishments. It includes goal-oriented activities that allow learners to actively participate in learning practices instead of remaining passive recipients of their teachers' knowledge (Schunk & Zimmerman, 2003). SRL is therefore a mechanism that can help students control their feelings, actions, and emotions to handle their learning effectively. It encourages students to set their learning goals to be productive learners. New self-regulation (SR) concepts embody all environmental, motivational, and meta-cognitive mechanisms that result in self-regulation rapid academic success and achievement (Sardareh, Mohd Saad & Boroomand, 2012).

According to Chelghoum (2017), self-regulation learning skills are to be accomplished by the introduction in the classroom of online learning platforms. Recently, digital learning, particularly online platforms, has been a central focus in education. Therefore, the ultimate aim of this paper is to investigate to what degree digital storytelling as an online platform can serve in improving the critical reading skills, critical thinking skills, and self-regulated skills of students. In other words, it tries to open up more possibilities for the learners to be more active in their education and learning, as well as to uncover students' willingness to learn with digital support.

## 1.1  Digital Storytelling Technique (DST)

Digital Storytelling is viewed as a short, first-person video narrative created by a combination of recorded voice, still and moving images, and music or other sounds (Kuan, Shiratuddin, & Harun, 2012). DTS includes a mix between a traditional storytelling approach and multimedia, designed specifically to engage students through a variety of technology applications to organize, edit and assemble a digital story (Normann, 2011). It's a form of personal storytelling that combines voice, image, and printed text to tell a short—usually 3-to 5-minute—focused story (Lambert, 2009; Ohler, 2010; Robin, 2008). In the digital storytelling approach, computers act as intellectual partners in the construction of knowledge, sharing the cognitive burden of performing tasks (Saloman, Perkins, & Globerson, 1991).

DTS is a pedagogical approach widely recognized for its attractive, participatory, and immersive qualities (Warschauer & Ware, 2008; McLellan, 2006; Davis, 2006; Salpeter, 2005; Hull & Nelson, 2005; Ohler, 2005; Farmer, 2004; Hull & Zacher, 2004; Kajder, 2004; Marcuss, 2003; Weis, Benmayer, O'Leary, & Eynon, 2002). In the classroom, it is an expressive medium for integrating subject matter, knowledge, and skills from various fields of the curriculum. DTS places special emphasis on cooperative work and culminates in experiences resulting from people sharing stories before focusing on technology skills and the development of high-quality media products. Using DTS, therefore, facilitates and builds additional community links through a process of listening to and reflecting on the stories provided and shared online.

Technology-integrated story-making process also enables learners to think deeply about their subject and personalized experiences, to clarify their knowledge, and to reflect on their thoughts (Sadik, 2008). It not only enables learners to enhance their personality but also enables them to enhance their imagination through constructive tasks and activities (Dupain & Maguire, 2005). DTS provides personalized learning experiences that contribute to productive knowledge creators rather than passive users (Ohler, 2006).

Based on their ability to instill self-confidence in better performance, digital storytelling prepares students for learning experiences where they interact with others personally, develop their communication skills, and improves their performance through peer supervision and reflection (Hungm, Hwangm & Huang, 2012). In addition, digital storytelling provides flexible learning environments for enhanced student collaboration, judicial literacy, communication, and technology skills acquired through a resource-sharing process (Behmer, 2005; VanderArk & Schneider, 2012; Smeda, 2014). According to Smeda (2014), students use and improve their skills for multiple ICT applications during the digital story creation process. By developing, improving, and sharing their story, on the one hand, and browsing the stories of other students, students improve their understanding of the subject and enhance their learning experience.

Digital storytelling allows students to have an active role in the learning process, they are active learners not to be just passive listeners (Ohler, 2006). Students designing their learning through DTS, as a constructivist, student-centered approach, feel ownership of their learning. Hence, they are responsible for their learning with a minimum authority of teachers, students' active role in learning is maximized whereas teachers' dominating role is kept minimal. Prince (2004), the core elements of active learning are student activity and participation in the learning process, which is not present in traditional classrooms where students passively listen to teachers who are considered the only provider of knowledge.

Digital storytelling coincides with the principles of active learning as it promotes opportunities for integrating student-centered approaches and interactive learning within technology-rich environments, hence, it helps students actively involved in active learning (Dupain & Maguire, 2005; Smeda, 2014). Active learning involves students' active participation in preparing the taught, judging the teaching resources, and sharing the finished products. The teacher/Student role ratio distribution premise is no longer unequal in favor of teachers. Learners are effectively responsible for their learning, it is not a choice to

take care of the learning process, it is also not a privilege for teachers to overwhelm the education process. Rather, it is a taking-turn process or a role-play interaction between teachers and learners, as if it is an orchestra with its leader and players. Students are the chief players with their teacher orchestrate their work to achieve the prescribed agreed on goals.

The digital storytelling approach triggers student engagement by providing them with ICT learning experiences that encourage learners to take an active part in selecting resources and producing materials, to spend a lot of time and effort willingly on tasks and activities, and to guide their own and colleagues' learning. Using ICT-based teaching and learning approaches is a major trend that has proven to be effective in raising student motivation. The interesting technology-integrated stories used inside and outside the classroom help motivate students to perceive academic concepts and to present their ideas, opinions, and thoughts (Dupain & Maguire, 2005).

## 1.2   Critical reading skills

The readers need to view the writers' point of view of the passage critically in the reading activity. It is performed by exploring the implied primary idea, defining the purposes, separating the facts and opinions, recognizing the tone of the writers, taking inference and conclusion to effectively grasp the information from the texts (Bowen et al., 1985). Critical reading skills are important to students because they affect the critical thinking skills that are needed today and, in turn, help them to be critical citizens and critical readers (Par 2018).

Critical reading refers to an investigation of the validity of arguments expressed in reading passages, and a criticism of them (Walz, 2001). Underlying meanings are enmeshed within a text's surface or face-value meaning, which can try to convince the reader, sometimes with biased opinions, imbalanced presentation of evidence, or even deliberately including factual inaccuracies. It is the task of a critical reader to 'read between the lines and to undertake an analysis of a text to understand its full meaning comprehensively. There are multiple meanings of the term critical reading, but it can be split broadly into two different traditions: reading for academic success and reading for social engagement. According to Manarin, et al. (2015, p. 4), the following key skills consist of reading critically for academic success: 1) identifying textual element patterns, 2) distinguishing between the main and subordinate ideas, 3) assessing credibility, 4) making judgments on how to argue a text, and 5) making relevant inferences regarding the text.

Reading critically for social engagement implies an understanding of how texts, such as addressing gender or income inequality, can be used to achieve social objectives. Students also need to have an awareness of how literacy is used for social purposes to master critical reading, how an author can write to achieve their ends, and how to treat their reflection on the meaning of a text with a sense of social purpose (Larking, 2017).

Wallace (2003) claims that reading for social purposes is social in the sense that readers and writers perform their roles as members of a community; social in that it develops both in an immediate and broader social context in social context. "The context" (p. 9). This calls for an interactive form of reading where there is a connection between the producers of texts, receivers, the community, and the text itself. Critical reading, from this perspective, the following criteria are necessary for: 1) sifting through different forms of rhetoric, 2) recognizing relationships with power, 3) questioning suppositions, 4) engaging with the world, and 5) building new possibilities (Manarin et al. 2015, p. 6).

Wilson (2016) argued that critical thinking processes can be used for critical reading pedagogy; students should be taught not only how to read, but also how to think critically and reflectively as they read. Although critical reading and critical thinking are closely related, they are not the same thing. One might

think critically without reading, but without critical thinking, people cannot read critically. In other words, critical reading cannot be done without critical thinking. Critical reading makes use of critical thinking processes such as analysis, synthesis, and evaluation (Lee 2015).

When critical readers or critical thinkers receive new information through reading for readers and through listening or reading for thinkers, they first make an initial understanding of it, then interpret and integrate the information they receive to gain a deeper understanding, and then reflect on and evaluate the information by applying their knowledge and experience from the outside. A higher level of cognitive activity is required when the process of understanding is more complex; therefore, critical reading can help readers become independent thinkers (Collins & Cheek 1993).

In this part of the literature, researchers have documented comparative studies showing the effects of digital storytelling on improving the reading comprehension skills of students in various fields. Royer & Richards (2007) investigated the alignment between the digital storytelling process and the scientific-based reading research comprehension recommendations of the National Reading Panel. It also examines the effect of digital storytelling in increasing reading comprehension. It is revealed that digital storytelling is an effective approach for enhancing reading comprehension skills. In addition, Anggeraini & Afifah (2017) examined to what extent is advanced digital storytelling effective to teach short story reading. Results of the study revealed that digital storytelling media is effective in improving the reading comprehension skills of university students. DTS increased students' ability in reading short stories, increasing vocabulary, reading dramatic and romantic stories, learning to read short stories, online reading and video, digital storytelling, video, and digital storytelling, etc. Students have revealed this improvement after applying digital storytelling to teaching.

Also, Belet & Dal (2010) explored the primary education pre-service teachers' opinions about the use of storytelling to develop the primary school students' critical reading skills. As a result of the study, it was obtained that the pre-service teachers had positive opinions about the use of storytelling to develop the critical reading skill and their opinions about the contribution of the method were compatible with the skills explained in literature within the context of critical reading. Consequently, the pre-service teachers suggested carrying out the studies on the applications of the method during their education.

## 1.3 Critical thinking skills

In 1597, Francis Bacon wrote the now-famous phrase 'Scientia potentia est.' These words have since been paraphrased as 'knowledge is power.' Knowledge as perceived by some is a static concept. The essence of knowledge has been the subject of debate, it's millennia. Knowledge encompasses the collection of facts and information relevant to a specific subject. Halpern (1996) suggests that knowledge is not static, but rather dynamic, as current knowledge builds on old knowledge, which in turn creates new knowledge. Knowledge has always been the value of society (Flores, et al. 2010). Reports state that there is an increase in the number of educated people every year, whether in advanced or developed countries. Young people, however, only learn to get better jobs, a college degree has become the currency of the job application. Those with no university degrees lose the opportunity to apply for jobs.

With so many educated people, why are we still witnessing behaviors and thoughts that are ill-conceived? Mere education does not necessarily lead to better thinkers. This makes Tsui (2002) differentiate between teaching students what to think (highly educated) and teaching them how to think (better educated). What appears to be lacking is the capacity to take knowledge and transform it into uses that benefit not only the individual but, more importantly, society as a whole. In this sense, thought then becomes the application of knowledge. According to Flores, et al. (2010), much of what individuals think is based on rote and requires no special application of thought. Individuals apply knowledge when they do simple math or write a grammatically correct sentence. Decisions are made in these examples, but

these actions take place almost without thought. This way of thinking is vastly different from understanding why we hold certain values. Critical thinking is the ability to see beyond simple facts, to think at a more comprehensive level.

Critical thinking is the ability to ask and/or answer insightful questions in the most productive way to reach a comprehensive understanding (Hilsdon, 2010). Critical thinking is probably the most recent label for what many call for analytical reasoning, synthesis, problem-solving, or higher mental processes (Scriven & Paul, 1992). Much of the confusion surrounding the definition of higher-order thinking stems from the inconsistent use of the term critical thinking (Lewis and Smith, 1993). Critical thinking consists of interpretation, analysis, evaluation, explanation synthesizing, inference, and self-regulation. Empowering critical thinking skills among higher education students, particularly in academic writing, through the integration of critical thinking into the learning process, is essential to develop student problem-solving, decision-making, and communication skills (Abdullah, 2014; Adege, 2016; McLean, 2005).

At least three distinct meanings have been assigned to critical thinking: (a) critical thinking as problem-solving; (b) critical thinking as evaluation and judgment, and (c) critical thinking as a combination of assessment and problem-solving". There are several teaching domains embodied in what they called higher thinking. Thinking about the argument analysis involves one domain. When this thinking is done reflectively, it might be called critical thinking. The other domain is related to problem-solving. Higher-order thinking encompasses critical thinking, creative thinking, problem-solving, and decision-making. (Lewis and Smith, 1993). According to Facione (1992), critical thinking is a purposeful, self-regulatory judgment that results in interpretation, analysis, assessment, and inference, as well as an explanation of the evidential, conceptual, methodological, criterionological, or contextual considerations on which that judgment is based. Therefore, critical thinking is closely related to self-regulation learning skills as it is based on students' ability to lead their learning after careful judgments of taught materials.

A critical thinker solves a complex problem by raising vital questions, collecting relevant information, identifying findings, and communicating effectively (Paul and Elder, 2006). Therefore, the need to develop critical thinking is essential, especially in this fast-paced world. Students should be equipped with the necessary skills that make them wise and responsible citizens who contribute to society, and not merely consumers of the distractions of society. According to Huitt (1992), the shift to the information age focused attention on good thinking as an important element of life's success. These changing conditions require new outcomes, such as critical thinking, to be included as a schooling focus.

Researchers have also documented comparative studies showing the effects of digital storytelling on improving the critical thinking skills of students in different disciplines. The study of Parsazadeh, Cheng, Wu & Huang (2021) examined the impact of incorporating the computational thinking concept within digital storytelling on learner motivation and performance was investigated. Computational thinking (CT) is a problem-solving technique that can help pupils learn English more effectively. In the English language learning classroom, the strategy of "present, practice, and produce" was used to present computational thinking. The experimental investigation included fifty-two primary school students. The experimental findings show that the CT technique improves students' language acquisition and motivation in both extrinsic and intrinsic goal orientation aspects. These findings suggest that the CT technique has a good impact on students' problem-solving abilities while also increasing their motivation and performance in English language learning.

In addition, Basyoni, Bee & Seng (2020) developed and evaluated the impact of students' created DST to improve the Saudi ninth grader's CLS. The quasi-experimental design was used for this research. Several 60 ninth graders from 2 classes from a school in Riyadh city were chosen to conduct this research. A control group consists of 30 students and an experimental group consists of 30 students. Three

instruments will be used in this research. A DST checklist of observation is used to investigate whether participants can create their digital storytelling systematically. Findings revealed a high impact of DST in increasing CLS through retelling techniques.

Furthermore, Yang & Wu (2012) explored the impact of digital storytelling (DST) on the academic achievement, critical thinking, and learning motivation of senior high school students learning English as a foreign language. The study findings indicate that DST participants performed significantly better than lecture-type ITII participants in terms of English achievement, critical thinking, and learning motivation. Interview results highlight the important educational value of DST, as both, the instructor and students reported that DST increased students' understanding of course content, willingness to explore, and ability to think critically, factors which are important in preparing students for an ever-changing 21st century.

### 1.4 Self-regulated learning skills

Self-regulation refers to the learning process that is the result of the cognitive control of students and their achievements. It encompasses targeted activities that allow learners to actively engage in learning practices rather than remain passive recipients of knowledge provided by their teachers. It enables students to set their learning objectives to be successful learners. New definitions of self-regulation (SR) encompass all aspects of the environment, Motivational and meta-cognitive processes that result in rapid academic success and achievement" (Schunk & Zimmerman, 2003). Unlike passive learners, self-regulated students seek information when faced with barriers such as confusing teachers, lack of information, or poor learning conditions. He adds that the key concepts of self-regulation are meta-cognition, motivation, and behavior (Zimmerman, 1990). Researchers relate self-regulated learning (SRL) usually related to numerous concepts such as self-control, self-management, behaviors, problem solving, meta-cognition, etc. (Martin & McLellan, 2007).

Lack of clarity in literature affects definitions of metacognition, self-regulation, and self-directed learning (Kaplan, 2008, Alexander, 2008, Loyens et al., 2008). There are no clear lines between these three concepts, two of which are interrelated but separate from each other, namely meta-cognition and self-regulatory learning, both of which should be considered as subtypes of a more general capacity for self-regulatory action (Kaplan, 2008). Self-directed learning, meanwhile, is a broader concept that includes self-regulatory learning in the context of problem-based learning (Loyens et al., 2008).

Zimmerman (1990) distinguishes between self-regulation processes, such as self-efficacy, and the strategies used to maximize these processes, such as the objectives and tools set by the learners. In terms of academic achievement, Zimmerman further points out that SRL encompasses three main features: (a) the use of self-regulatory learning strategies; (b) responsiveness to self-oriented feedback; and (c) interdependent motivational processes for students. Pintrich and De Groot (1990) believe that student involvement in the SRL and students' efficacy beliefs about their performance and skills are highly correlated. Therefore, the correlation directs learners towards appropriate learning strategies and encourages them to develop their academic scores, which is the aim of many learners, including those who are lazy or reluctant to learn.

Self-regulated learners feel a sense of ownership in determining learning needs by accepting assistance from others, teachers or peers or not, expressing their learning objectives, identifying human and material resources for learning, selecting and implementing appropriate learning strategies, and taking initiatives to assess learning outcomes (Knowles, 1975). Self-regulated learning is a process that involves both cognitive and behavioral learning; it is a cognitive process that allows learners to look from another window into the surrounding environment and the world as they move towards changing their perspectives based on action thinking (Brookfield, 1986).

Self-regulated learning is not just a learning process; it is a skill that should be acquired by students; it is also an aim of the whole learning process that effectively enhances the interaction between students and their environment; knowledge acquisition without awareness of the social environment; learning by reading and defining individuals based on the relationship with the environment; To sum up, self-directed learning involves self-management of the entire learning process (Candy, 1991).

Researchers have also documented comparative studies showing the effects of digital storytelling on enhancing the self-regulatory learning skills of students in various fields. Smeda, Dakich & Sharda (2014) investigated the pedagogical aspects of digital storytelling and the impact of digital storytelling on student learning when teachers and students use digital stories. It is revealed that digital storytelling is a powerful tool to integrate instructional messages with learning activities to create more engaging and exciting learning environments. It is a meaningful approach for creating a constructivist learning environment. Thus, this approach has the potential to enhance student engagement and provide better educational outcomes for learners that can increase self-regulation learning skills.

## 2. Methods

### Participants

In this study, a total of 103 third-year undergraduate university students - prospective teachers of Arabic – in Kuwait University. Participants were enrolled for advanced reading skills courses; they were selected using a comprehensive sampling method. In the students' university stay, Advanced reading Skills Course is the final reading course given to them. Before this course, the students have taken both Basic and Intermediate Reading Skills Courses in their university stay. Participants were divided into two main subgroups; the experimental group including 45 students who were taught using online digital storytelling, and the control group consisting 58 that were taught using the traditional lecture approach.

### Design of the Study

The research design of the study was quasi-experimental that employs a time series design with the experimental group participants. For this study, the participants in both the experimental and control group were given a series of critical reading skills, critical thinking skills, and self-directed learning skills pretests before the intervention, digital storytelling-based instruction (only for the experimental group), and other critical reading skills, critical thinking skills, and self-directed learning skills posttests. The current study used parametric tests due to the normal distribution of participants' scores.

### Measures:

### 1. Critical Reading Comprehension Test (CRCT)

To measure Arabic language prospective teachers' critical reading skills, the Critical Reading Comprehension Test (CRCT) in the form of multiple-choice questions was administered. The test items focused on measuring analytical and inferential critical reading skills in the determination of *the main idea*, *purpose*, *tone*, *inference*, and *conclusion of the texts*. The test items have been adapted from the prospective teachers' Critical Reading course. Test items were initially tested for validity and reliability. The result of the pilot test showed that the alpha value of the Cronbach coefficient was 0.86. The CRCT, as a study tool, was therefore highly reliable to be administered for the measurement of student critical reading skills. The test result was then analyzed using a *t*-test to determine the difference in critical reading skills between the experimental and control groups. Version 23.0 of the Statistical Package for Social Sciences (SPSS) was used to compute the data.

### 2. Critical Thinking Skills Scale

California Critical Thinking Skills Test (CCTST) (2000) consists of 34 multiple choice items, each item has 4 alternatives, some items have five items. Each correct answer is given (1) whereas the wrong answer is granted (0), thus, the total score ranges from 0 to 34. The resulting CCTST instruments constitute a rich and robust collection of tools for evaluating critical thinking skills in a variety of test-taker populations. CCTST provides the following scale scores to inform test administrators of these relative strengths and weaknesses; analysis, inference, evaluation, induction, and deduction.

Table 1. Scale Scores Recommended Performance Assessment

| CCTST Scale Score | No. of items | CCTST 2000 (34-point Version) Scale Scores Recommended Performance Assessment | | |
|---|---|---|---|---|
| | | Not manifested | Moderate | Strong |
| Analysis | 6 | 0 – 2 | 3 - 4 | 5 or more |
| Inference | 6 | 0 – 2 | 3 - 4 | 5 or more |
| Evaluation | 4 | 0 – 1 | 2 - 3 | 3 or more |
| Induction | 12 | 0 – 5 | 6 - 11 | 12 or more |
| Deduction | 6 | 0 – 2 | 3 - 4 | 5 or more |

The instrument is typically administered in 45-50 minutes. There are varying numbers of items on each form, but in each case, the length of the instrument is set to permit maximum performance within the range of possible effort for the intended test-taker group. Each item requires that the test-taker make an accurate and complete interpretation of the question. The test-retest reliability measured with Pearson coefficient was α=0.82. The Pearson coefficient for the '*Analysis*' subscale was α=0.81, for the '*Inference*' subscale was α=0.75, for the '*Evaluation*' was α=0.88, for the '*Induction*' was α=0.87 and for the '*Deduction*' was α=0.86.

### 3. Self-Rating Scale of Self-directed Learning (SRSSDL)

To explore the gains made in the Arabic language section of students' level of self-directed learning skills. Williamson (2007) self-assessment of self-directed learning skills has been used. Students need to have good, self-directed learning skills. Students should therefore develop their roles in learning through a continuous process of monitoring their learning progress, identifying deficit areas, and making continuous efforts to achieve self-improvement. The SRSSDL structure included a brief profile of the respondents and general instructions on how to use the scale. The SRSSDL consisted of 60 items categorized into five broad areas of self-directed learning:

(a) *Awareness*: 12 items relating to learners' understanding of the factors that contribute to becoming self-directed learners.

b) *Learning strategies*: 12 items explaining the different strategies for self-directed learners should be adopted to be self-directed in their learning process.

(c) *Learning activities*: 12 items specifying the required learning activities of the learner should be actively engaged to be self-directed in their learning process.

d) *Evaluation*: 12 items that reveal the specific attributes of learners to help them monitor their learning activities.

(e) *Interpersonal skills*: 12 subjects about the skills of learners in interpersonal relationships, which are pre-requisites for becoming self-directed learners.

All SRSSDL items have been positively stated. For each item, the "always" response was rated as 5, and the "never" response was rated as 1. Thus, the maximum and minimum possible SRSSDL scores were 300 and 60, respectively. A score sheet has been developed to interpret the responses.

The test–retest reliability measured with Pearson coefficient was 0.79 (p= 0.01). The Pearson coefficient for the 'Awareness' subscale was 0.76 (p= 0.01), for the 'Learning strategies' subscale was 0.73 (p= 0.01), for the 'Learning activities' was 0.81 (p= 0.01), for the 'Evaluation' was 0.74 (p= 0.01) and for the 'Interpersonal skills' was 0.75 (p= 0.01).

## 3. Results

Table 2 presents the results of the independent sample *t*-test which examines the mean scores of the experimental and control groups in post-tests of the participants' critical reading skills immediately after implementing the digital storytelling approach on the participants of the experimental group.

Table 2. *t*-test of differences in the mean scores of the experimental and control groups in post-tests of the participants' critical reading skills

| Time | Before the intervention | | After the intervention | | Paired *t*-test | P-Value | Difference between the scores before and after the intervention | |
|---|---|---|---|---|---|---|---|---|
| Group | Mean | SD | Mean | SD | | | Mean | SD |
| **Control** | 20.36 | 2.84 | 20.78 | 2.91 | *t*=1.055 | .44 | -.15 | 5.35 |
| **Intervention** | 20.93 | 3.08 | 31.62 | 3.09 | *t*=23.38 | < 0.01 | 10.69 | 6.20 |
| **Statistical Test** | *t*=.816 | | *t*=18.24 | | | | Z= 3.990 | |
| *P* **Value** | .42 | | < 0.05 | | | | < 0.001 | |

Results of the *t*-test revealed the impact of implementing online digital storytelling on improving critical reading skills. It is shown through calculating the differences in the mean scores of experimental and control groups the post-tests of the participants' critical reading skills after controlling for the post-tests. Based on differences in the mean scores of the two groups; experimental and control groups, the experimental groups scored higher their counterparts in the control with mean scores; control group (M=20.93, SD=3.08) whereas the intervention (M=31.62 SD=3.09), respectively.

Table 3 presents the results of the independent sample *t*-test which examines the mean scores of the experimental and control groups in post-tests of the participants' critical thinking skills immediately after implementing the digital storytelling approach only on the participants of the experimental group.

Table 3. *t*-test of differences in the mean scores of the experimental and control groups in post-tests of the participants' critical thinking skills

| subskills | Group | Before the intervention | | After the intervention | | Paired *t*-test | P Value | Difference between the scores before and after the intervention | |
|---|---|---|---|---|---|---|---|---|---|
| | | Mean | SD | Mean | SD | | | Mean | SD |
| **Analysis** | Control | 2.01 | .73 | 2.05 | .71 | *t*=.784 | .427 | .04 | .35 |
| | Intervention | 2.13 | .75 | 4.15 | .74 | *t*=14.65 | < 0.01 | 2.02 | 1.20 |
| **Inference** | Control | 1.50 | .71 | 1.55 | .65 | *t*=.077 | .621 | .05 | .65 |
| | Intervention | 1.51 | .76 | 3.51 | .54 | *t*=16.17 | < 0.01 | 2.0 | .54 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Evaluation** | Control | 2.00 | .65 | 1.96 | .62 | $t$=.176 | .816 | -.04 | .66 |
| | Intervention | 2.02 | .62 | 4.08 | .67 | $t$=16.66 | < 0.01 | 2.06 | 1.68 |
| **Induction** | Control | 2.03 | .62 | 2.05 | .60 | $t$=626 | .697 | .02 | .61 |
| | Intervention | 2.11 | .61 | 4.15 | .60 | $t$=17.55 | < 0.01 | 2.04 | 1.60 |
| **Deduction** | Control | 2.63 | .52 | 2.62 | .52 | $t$=496 | .479 | .01 | .52 |
| | Intervention | 2.68 | .51 | 4.66 | .52 | $t$=19.68 | < 0.01 | 1.96 | 1.54 |
| **Total** | Control | 10.18 | 1.89 | 10.24 | 1.62 | $t$=725 | .666 | .06 | 1.62 |
| | Intervention | 10.46 | 1.96 | 20.58 | 2.09 | $t$=28.21 | < 0.01 | 10.12 | 2.09 |
| **Statistical Test** | | $t$= 1.09 | | $t$=2.252 | | | | Z= 3.09 | |
| **P Value** | | .40 | | < 0.05 | | | | < 0.001 | |

Table 3 presents the results of the *t*-test which examines the impact of implementing online digital storytelling on improving critical thinking skills through calculating the differences in the mean scores of experimental and control groups the post-tests of the participants' critical thinking skills after controlling for the post-tests. Based on differences in the mean scores of the two groups; experimental and control groups, the experimental groups scored higher their counterparts in the control with mean scores; control (M=10.46, SD=1.96), and intervention (M=20.58, SD=2.09) respectively.
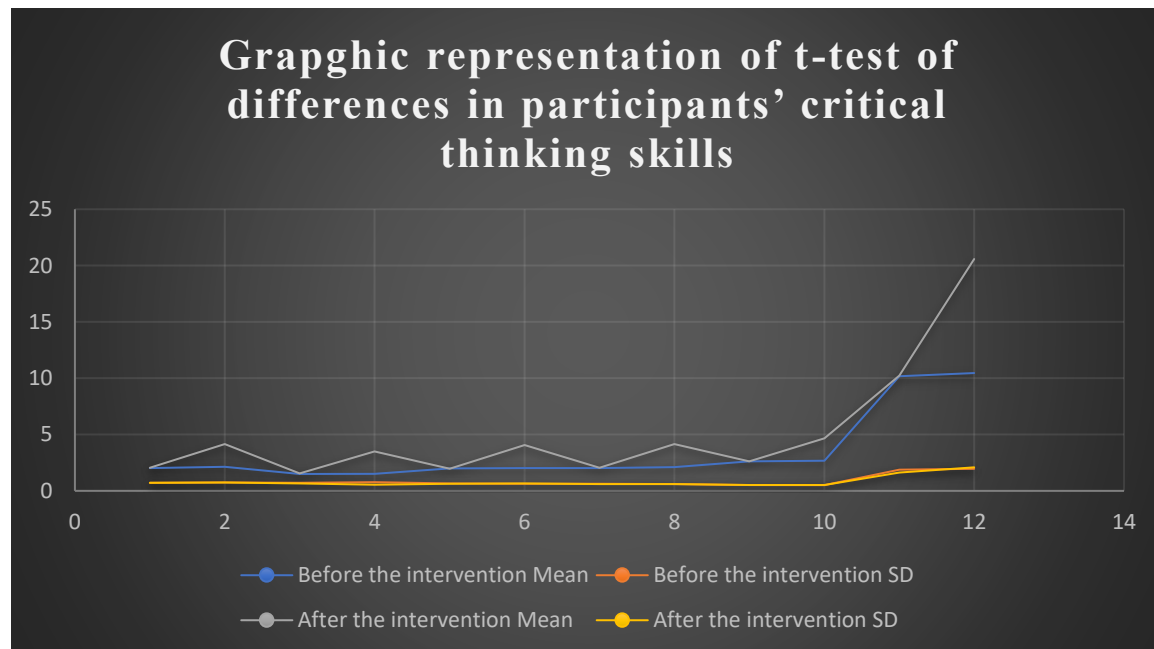


Fig. Graphic representation of t-test of differences in participants' critical thinking skills

Table 4 presents the results of the independent sample *t*-test which examines the mean scores of the experimental and control groups in post-tests of the participants' self-directed learning skills immediately after implementing the digital storytelling approach only on the participants of the experimental group.

Table 4. *t*-test of differences in the mean scores of the experimental and control groups in post-tests of the participants' self-directed learning skills

| subskills | Group | Before the intervention | | After the intervention | | Paired *t*-test | *P* Value | Difference between the scores before and after the intervention | |
|---|---|---|---|---|---|---|---|---|---|
| | | Mean | SD | Mean | SD | | | Mean | SD |
| **Awareness** | Control | 26.62 | 4.91 | 27.52 | 5.54 | *t*= 387 | .478 | -0.9 | 5.92 |
| | Intervention | 26.22 | 5.32 | 44.08 | 4.37 | *t*=16.46 | < 0.01 | 18.58 | 4.78 |
| **Learning strategies** | Control | 26.41 | 5.46 | 27.20 | 6.02 | *t*=1.96 | .848 | -0.79 | 7.94 |
| | Intervention | 25.33 | 4.96 | 45.11 | 4.93 | *t*=16.16 | < 0.01 | 19.78 | 4.91 |
| **Learning activities** | Control | 26.73 | 4.95 | 27.22 | 5.00 | *t*=1.420 | .470 | -0.49 | 6.02 |
| | Intervention | 25.68 | 3.61 | 44.57 | 4.49 | *t*=18.23 | < 0.01 | 18.89 | 5.59 |
| **Evaluation** | Control | 27.77 | 3.77 | 27.60 | 3.86 | *t*=1.049 | .360 | -0.17 | 3.79 |
| | Intervention | 26.71 | 3.01 | 43.57 | 4.49 | *t*=21.79 | < 0.01 | 16.86 | 3.14 |
| **Interpersonal skills** | Control | 27.13 | 4.13 | 26.86 | 4.31 | *t*=1.066 | .343 | -0.27 | 3.89 |
| | Intervention | 26.77 | 3.63 | 43.35 | 4.76 | *t*=18.38 | < 0.01 | 16.58 | 3.01 |
| **Total** | Control | 134.67 | 18.92 | 136.41 | 20.41 | *t*=1.050 | .450 | -1.74 | 6.89 |
| | Intervention | 130.71 | 15.17 | 220.71 | 18.79 | *t*=21.51 | < 0.01 | 90.00 | 10.07 |
| **Statistical Test** | | *t*= 1.096 | | *t*=4.216 | | | | Z= 4.590 | |
| ***P* Value** | | .30 | | < 0.05 | | | | < 0.001 | |

Table 4 presents the results of the *t*-test which examines the impact of implementing online digital storytelling on improving self-directed learning skills through calculating the differences in the mean scores of experimental and control groups the post-tests of the participants' self-directed learning skills after controlling for the post-tests. Based on differences in the mean scores of the two groups; experimental and control groups, the experimental groups scored higher than their counterparts in the control with mean scores; control (M=136.41, SD=20.41), and intervention (M=220.71, SD=18,79) respectively.

## 4. Discussions

As far as critical reading skills are concerned, the experimental group outperformed the comparison group, echoing the results of Royer & Richards (2007) and Sahibzada, Ahmadzai, Niaz, & Laftah (2020), DST students often listened to stories from their team and classmates, and during the pre-school period. Phases of production and distribution, evaluation of story designs and digital storytelling presentations by other groups. In addition to completing their own final project, participants needed to fully understand the content of their classmate presentations in order to provide suggestions and feedback.

In addition, DST participants were provided with state-of-the-art technology for voice recording and audio editing, as well as a collaborative and authentic environment in which critical thinking in the spoken and written materials was a valuable and productive skill, integral to working together towards the final goal of creating a digital story. As a result, the emphasis on collaboration and production (Sadik, 2008) in the DST group resulted in improved listening comprehension compared to participants in the IT Integrated Training Setting, who lacked similar opportunities for collaborative meaningfulness building in authentic productive environments.

Producing and using digital stories enhances digital, cultural, and literacy skills, and responds to a multi-literacy approach to language learning that empowers learning and teaching engagement (Navehebrahim,

2011). Adopting a digital storytelling approach is a smart response for communities thirsty for technology in an era characterized by a phenomenon of techomania. Digital stories are believed to trigger active learning and deep learning or even active deep learning in advanced stages. The story is an effective pedagogical tool that provides an opportunity for deep learning.

With regards to the effect of digital storytelling on increasing self-regulation skills, results showed that students learn better when teachers and students use digital stories. Digital storytelling is a powerful tool to integrate instructional messages with learning activities to create more engaging and exciting learning environments. It is a meaningful approach for creating a constructivist learning environment. Thus, this approach has the potential to enhance student engagement and provide better educational outcomes for learners that can increase self-regulation learning skills (Smeda, Dakich & Sharda, 2014). Also, Bullock (2013) investigated the impact of digital technologies on the promotion of self-directed learning for pre-service teacher education. The results of the study provided an opportunity for students to engage in sustained, self-directed learning experiences using digital technologies. Findings indicate that candidates have chosen tasks for themselves, both for personal and pragmatic reasons and that external pressures have played a significant role in the ability of candidates to see their tasks through to a satisfactory completion.

## 5. Conclusions

Digital storytelling (DST), as a transformative, integrated training strategy for IT, takes advantage of technological advancements, a clear approach. Production process and low-cost media materials and an effective learning environment foster collaboration and co-construction of its meaning. DST is a valuable tool for stimulating learning and motivating participants to collaboratively construct and personalize digital narratives as authentic learning products. Results of this quasi-experimental study suggest that after 12 weeks of DST training, prospective teachers of Arabic have shown significant improvements in improving critical reading skills (as measured by CRCT), critical thinking skills (as measured by CCTST), and self-directed learning skills (as measured by SRSSDL). In addition, qualitative feedback from semi-structured interviews with the third-year college of Education students (prospective teachers of Arabic). Therefore, students support the potential of DST as an approach to fostering collaborative second-language learning in an environment that promotes learning and enhancing a higher level of thinking and learning self-regulatory learning.

While this study included a quasi-experimental design for the long-term assessment of dependent variables, some limitations must be considered. First, while our use of the self-designed critical reading skills Test has met the research objectives of evaluating the differences in the mean scores of both experimental and control groups level of critical reading skills, the instrument has not been standardized by using a larger sample, limiting the external validity of our findings. Semi-structured interviews with both instructors and students have been conducted to address this limitation. Future research should consider adopting a more rigorous approach to developing the validity of critical reading skills measures without sacrificing ecological validity, that is, through the use of standardized instruments (such as the CCTST and SRSSDL instruments used in this study). In terms of critical thinking skills, future research could also include other scales of such abilities/skills and additional subscales from critical thinking skills tests. Future studies in DST are recommended to recognize the value of qualitative as well as quantitative measures and to consider the role of learners to influence and engage in learning.

While the study results revealed that DTS is an effective approach to developing both critical reading skills and critical thinking skills of Arabic language prospective teachers, digital literacy levels among college of education students at Kuwait university should be carefully examined. In addition, the main instructional approach investigated for its effectiveness on improving college of education students'

critical reading and thinking skills, yet, further investigation of the impact of accompanying inquiry-based instructional practices in enhancing the target high-order thinking skills.

Again, while training design based on social constructivist and integrated IT approaches to transformative learning has been demonstrated the effectiveness of student collaboration in constructing and negotiating meaning, the individual characteristics of these digital narratives (i.e., external and internal thinking styles) should be examined. Students' preferred learning styles affect the way they learn and the outcome of the learning process. Students with an external thinking style tend to be more extroverted and prefer to learn collaboratively, while students with an internal thinking style tend to be introverted and prefer to learn on their own (Betoret, 2007; Sternberg, 1999).

In addition, follow-up research is strongly encouraged to explore the influence of DST or other technology-integrated pedagogy. Promoting 21st-century skills, such as creative thinking, problem-solving, and global literacy. As our study has shown the potential of DST in terms of critical reading skills, critical thinking skills, and self-regulatory skills, students, instructors, and researchers should be confident in developing a variety of courses with interesting and challenging digital storytelling strategies. With this effort, the development of learning behaviors, including critical reading skills, critical thinking skills, and self-regulatory skills, will develop active learners who will be prepared for the sweeping changes of the future.

To sum up, the implementation of DST in language education has many advantages, such as providing creative teaching methods, more variation than traditional approaches, and personalized learning. In addition, it grants experience, real-life situations in a simple and meaningful way, and engaging learning experiences. The integration of DST into the language curriculum is a significant step in language learning and teaching processes that can enhance students' ability to learn four languages, listening, reading, and writing skills. However, it should be noted that in addition to all positive findings on DST integration in education, more practical and extensive studies should be conducted to find out more about the different aspects of DST. The next stage of our work will be a practical study of DST and its peculiar educational features, as well as an experimental confirmation of results obtained.

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