

# Research on Digital Storytelling (DST) in the Context of Information and Communication Technologies (ICT): A Systematic Review (January 2018- June 2023)\*

## REVIEW ARTICLE

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Gönderilme Tarihi: 02.06.2023 Kabul Tarihi: 28.11.2023 DOI: 10.37669/milliegitim.1309013

**Atf:** “Varol Selçuk, Z., Mercan, G. ve Varol Selçuk, Z. (2023). Research on digital storytelling (DST) in the context of information and communication technologies (ICT): A systematic review (January 2018- June 2023). *Millî Eğitim*, 52 (Özel Sayı), 941-970. DOI: 10.37669/milliegitim.1309013”

### Abstract

*Digital Storytelling (DS) has been used in many different subjects in recent years. DS promises a more democratic and equal education by creating educational environments through diversity communication. This research aims to systematically examine the educational use of digital storytelling, which is one of the methods of integrating ICT (Information and Communication Technologies) into educational research and practice. This study, in particular, aims to explore the ongoing challenges of ICT integration in addressing educational challenges and to what extent DS can contribute to solving these ICT challenges. The study presents systematic reviews of 63 studies on ICT Education (36 studies) and DS (27 studies). As part of the study, the WoS and SCOPUS databases were included to search based on the specified criteria between January 2018 - May 2022. In the analysis of the data obtained in the study, analytical themes were used using both descriptive analysis and descriptive themes obtained as a result of inductive analysis. The data obtained at the end of the research are categorized according to distribution over the years, the countries where the research was conducted, the level of the research's educational field, subjects, sample/study group, research methods, and results of the research. These results provide important information on how digital storytelling and ICT integration can be effectively used in educational practices and research. This information can be a valuable resource for future applications and research and can encourage further expansion of the use of ICT and DS in education.*

**Keywords:** digital storytelling, education, ICT and education, systematic review

\* This study has been produced as a master's thesis from the Scientific and Technological Research Council of Türkiye (TÜBİTAK) 3005 project 'Identification and Elimination of Neuromyths in Biology Education: Development and Evaluation of the Effectiveness of Argumentation Contents with Digital Storytelling in an Educational Context', led by the third author. Additionally, it was presented as an oral presentation at the 23rd Internationale Frühjahrsschule held in Frankfurt am Main, Germany, on March 20 and 23, 2023 (Bu çalışma üçüncü yazarın yürütücüsü olduğu TÜBİTAK 3005 "Biyoloji Eğitiminde Nöromitlerin Belirlenmesi ve Giderilmesi: Eğitsel Bağlamda Dijital Hikaye Anlatımı İle Argümantasyon İçeriklerinin Geliştirilmesi ve Etkililiğinin Değerlendirilmesi" projesinden yüksek lisans tezi olarak üretilmiştir. Ayrıca 20. ve 23. Mart 2023'te Almanya Frankfurt am Main'de gerçekleştirilen 23. Internationale Frühjahrsschule'de sözlü bildiri olarak sunulmuştur).

## **Bilgi ve İletişim Teknolojileri (BİT) Kapsamında Dijital Hikâye Anlatımı (DHA) Üzerine Araştırma: Sistemik Bir İnceleme (Ocak 2018 – Eylül 2023)**

### **Öz**

*DHA (Dijital Hikaye Anlatımı) son yıllarda birçok farklı konuda kullanılmıştır. DHA, çeşitlilik iletişimi yoluyla eğitim ortamları oluşturarak daha demokratik ve eşit bir eğitim vaat etmektedir. Bu araştırma, eğitim araştırması ve pratiğinde BİT'yi (Bilgi ve İletişim Teknolojileri) entegre etme yöntemlerinden biri olan dijital hikaye anlatıcılığının eğitimsel kullanımını sistemli bir şekilde incelemeyi hedeflemektedir. Bu çalışma, özellikle, eğitim zorluklarına çözüm sağlama noktasında BİT entegrasyonunun süregelen zorluklarını ve DHA'nın bu BİT zorluklarının çözümüne ne ölçüde katkı sağlayabileceğini keşfetmeyi amaçlamaktadır. Çalışma, BİT Eğitimi (36 çalışma) ve Dijital Hikaye Anlatımı (27 çalışma) üzerine 63 çalışmanın sistemli incelemelerini sunmaktadır. Çalışmanın bir parçası olarak, belirlenen kriterlere dayanarak Ocak 2018 - Mayıs 2022 tarihleri arasında arama yapmak üzere WoS ve SCOPUS veri tabanları dahil edilmiştir. Çalışmada elde edilen verilerin analizinde, hem betimleyici analiz hem de induktif analizin sonucu olarak elde edilen betimleyici temalar kullanılarak analitik temalar kullanılmıştır. Araştırmanın sonucunda elde edilen veriler; yıllara göre dağılım, araştırmanın gerçekleştirildiği ülkeler, araştırmanın eğitim alanı seviyesi, konular, örnek/çalışma grubu, araştırma yöntemleri ve araştırmanın sonuçları gibi kategorilere ayrılmıştır. Bu sonuçlar; dijital hikaye anlatıcılığının ve BİT entegrasyonunun eğitim uygulamalarında ve araştırmalarında etkin bir şekilde nasıl kullanılacağına dair önemli bilgiler sağlamaktadır. Bu bilgiler; gelecekteki uygulamalar ve araştırmalar için değerli bir kaynak oluşturabilir ve eğitimde BİT ve DHA kullanımının daha da gelişmesini teşvik edebilir.*

**Anahtar Kelimeler:** dijital hikaye, eğitim, Bilgi ve İletişim Teknolojileri (BİT) ve eğitim, sistematik derleme

### **Introduction**

In the 21st century, with a rapidly increasing population, technology is advancing every day, making human development more crucial than ever. Concurrently, education is increasingly addressing the evolving needs of humans and society. These needs are dynamic and adapt based on current developments. Consequently, integrating technology into student-centered education, where students can efficiently demonstrate their performance using their cognitive skills, has gained importance (Harris, Marcus, and McLaren, 2001). Stemming from this need, the integration of Information and Communication Technologies (ICT) in education has grown over the years, leading to shifts in student character, needs, and expectations in line with 21st-century skills (Ivankovic, Spiranec, and Miljko, 2013).

With this shift, the significance of ICT becomes evident as educational paradigms transition towards an emphasis on “learning to learn”. Individuals are now encouraged to think, learn, and apply knowledge in novel ways throughout their lives (Erişti, 2010). However, it’s essential to note that in various countries, separate educational environments for individuals with special needs remain prevalent. Often, individuals are categorized without proper assessment and adaptation, with educational practices continuing based on these classifications. As such, many children still face varying degrees of segregation based on their abilities, environment, culture, or class (UNICEF, 2013; Mordal and Stromstad, 1998).

The mainstream approach to educating students with special needs shifted in the 1980s due to criticisms about the quality and equity of their education. As a result, the concept of “education” began to be perceived from a renewed perspective (Spence-Cochran, Pearl, and Walker, 2013). Shaddock, Giorcelli, and Smith (2007) suggest that education should encompass individuals facing educational deficits, as well as those who might face discrimination due to various factors. As such, education should prioritize inclusivity and account for all students who’ve faced marginalization (Loreman, Forlin, Chambers, Sharma, and Deppelen, 2014; Porter and Smith, 2011). The ultimate goal is to ensure that everyone has equal learning opportunities within a shared environment, accommodating their diverse needs. For successful teaching and learning, it’s pivotal to recognize and interact effectively with patterns in the educational environment (Rose and Strangman, 2007; Rose, 2001).

A prevalent method of integrating ICT into education is digital storytelling. This interactive approach fosters active participation and has been employed across various educational levels, from pre-school to higher education (Ferri et al., 2020; Pavlou, 2020; Del-Moral-Pérez et al., 2019; Saritepeci, 2020; Kevser, 2019; Schmoelz, 2018; Tanrikulu, 2020; Tokmak et al., 2019; Goldingay et al., 2018). Digital storytelling enriches education by facilitating student engagement, reflection, project-based learning, and technology integration (Barrett, 2006). Robin (2008) defines digital storytelling as a technology application that aids in creatively crafting stories. It blends various multimedia elements to share information, evoke memories, and express feelings on a topic (Gils, 2005; Meadows, 2003). The concept encompasses a broad spectrum, from personal narratives to web-based storytelling and short digital films.

In educational settings, digital storytelling offers a reflective space where participants can express their experiences. As individuals craft their digital narratives, they gain insights into their learning journeys, tapping into their intuition and creative potential. This participatory process lets educators tailor the learning experience more effectively to students’ unique interests, needs, and competencies. Digital storytelling

allows for the sharing of emotions and perspectives, enabling a transfer of personal meanings and deep-seated emotions (Gils, 2005). Recent reviews have identified diverse outcomes from educational digital storytelling, such as affective, cognitive, academic, and social benefits (Wu and Chen, 2020). While education presents challenges like a shortage of resources and diverse learner needs, ICT offers potential solutions. However, the integration of ICT also introduces new challenges. This review seeks to highlight the role of digital storytelling in addressing the challenges posed by both education and ICT integration.

## Methodology

The method of the research is a systematic review. In this method, the purpose of the researcher is usually to reveal the aims of academic studies, which theoretical framework and method they are based on, and the findings of the studies, related to the researcher's subject (Hallinger, 2018). A systematic review is a means of evaluating and interpreting all available research relevant to a particular research question, topic area, or phenomenon of interest (Kitchenham, 2004).

Systematic review studies can be performed by the researcher to assert the general tendency and research results related to any subject or discipline. It aims to identify and describe the general trends and research results in a particular research discipline (Çalık and Sözbilir, 2014). Hallinger (2013) suggest that review of the research can be organized around a set of questions which comprise a conceptual framework for conducting systematic reviews such as:

- What are the central topics of interest, guiding questions and goals?
- What conceptual perspective guides the review's selection, evaluation and interpretation of the studies?
- What are the sources and types of data employed for the review?
- How are data evaluated, analyzed and synthesized in the review?
- What are the major results, limitations and implications of the review?

In this study we used these questions to establish our conceptual framework and further detail in following subsections of the method. For the purpose of this review, studies in the field of education on digital storytelling were identified, analyzed, and interpreted with a focus on ICT.

The purpose of the review is to systematically examine the educational use of digital storytelling which is one of the ways of integrating ICT in educational research and practice. This study particularly seeks to discover the lasting obstacles of ICT

integration for the solution to challenges of education as well as to what extent DST can contribute to solving these challenges of ICT for education. Within the purpose of this systematic review, the recent researches conducted in different countries between January 2018 and May 2022 were included for detailed analysis with an idea to be as as possible. In this respect research questions addressed in this systematic review are given below:

RQ1: How many studies are there in the SCOPUS and Web of Science (WoS) databases on education and digital storytelling from January 2018 to May 2022, in open access journals?

RQ2: What contexts have been the object of study in education?

RQ3: To what extent can DST contribute to solving challenges of ICT integration for education?

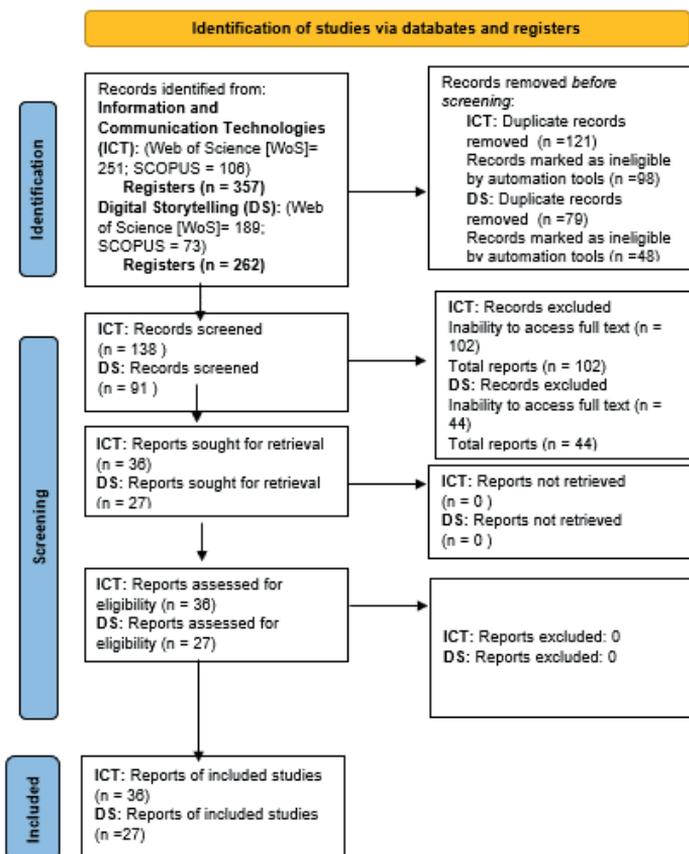
### **Data Collection Tools**

The data collection for the review was carried out on September 20, 2023, using Web of Science (WoS) and SCOPUS databases, with articles conforming to the criteria determined by the researchers. WoS and SCOPUS databases were chosen because of their wide use by the entire scientific world and acceptance in academic promotions. During the scanning process, in the WoS database, the research area “Educational Sciences” was selected to ensure that the obtained studies are in the field of educational sciences and focus on learning and teaching dynamics specific to this field. In the SCOPUS database, the “Social Sciences” category was chosen to provide a comprehensive social sciences perspective. The search criteria of the researches included in the review are limited by the use of advanced search options of the word/word 36 groups “ICT Education, Digital Storytelling” in the title and abstract field and the type of the document being an article. This systematic review is limited between January 2018 and May 2022 period. Accordingly, the criteria for inclusion in the study; to be an article for educators and/or learners in the field of educational sciences, to have the language of publication in English, to have access to the full text of the research; the exclusion criteria from the study; Non-experimental research, review, case reports, meta-analyses, and editorial material articles, short questionnaires, and duplicate articles are excluded. During the final phase, articles obtained from the WoS and SCOPUS databases were compared and duplicates were filtered out. This filtering process is crucial to ensure the dataset has a unique and diverse scope. After this stage, the unmatched articles from both databases were compiled in an Excel file for further analysis and review. After reading the titles and abstracts of the obtained articles, the method developed by Kitchenham (2004) was used to determine the planning, execu-

tion, and reporting stages for the analysis review regarding ICT and DS. Taking into account the features mentioned by Kitchenham (2004) related to systematic reviews, a framework for how research on ICT and DS would proceed has been established. The PRISMA (2020) methodology was used to determine and screen the articles in the identified three databases and to set eligibility criteria for the considered studies. The PRISMA (2020) flow chart regarding the research process is shown in Figure 1.

**Figure 1**

*PRISMA (2020) Flow Chart*



As seen in Figure 1, the articles evaluated as a result of the review were prepared in Microsoft Office Excel Program 2 tables as separate worksheets for each keyword. In the tables prepared, the authors of the publications were given the pub-

lication name, year, purpose, population and sample/study group, method, results, the link of the publication, and bibliography. The researches included in the research were evaluated independently by two researchers (SVZ, MG) and a total of 63 articles were reached according to the criteria determined in the research. The 63 articles are accessible in the database: <https://docs.google.com/spreadsheets/d/1Kq3vDW6RP-puJmwaKsnI30Cq39sMTNGcBqiwqjXphVLE/edit#gid=781384834>

### **Analysis of Data**

Descriptive analysis was used in the analysis of 63 articles reached according to the specified criteria. Accordingly, the theoretical framework in the relevant literature was used in the descriptive analysis of the codings (Miles and Huberman, 2015). Hereunder, the obtained codes compared according to their similarities and differences, and descriptive themes were formed by grouping them to form a hierarchical tree structure. Each formed group is called as a theme. Besides, new interpretative structures and explanations were given in addition to the themes formed by using the theoretical framework in the relevant literature in the context of the questions addressed within the scope of the research (Thomas and Hardene, 2008). Accordingly, using the descriptive themes obtained as a result of the inductive analysis, analytical themes were also generated.

### **Results**

In this section, the findings of the analysis of the data obtained from the research is reported according to the research questions.

RQ1: How many studies are there in the SCOPUS and Web of Science (WoS) databases on Information and Communication Technologies (ICT) education, digital storytelling from January 2018 to May 2022, in open access journals?

Findings pertaining to the years, country, and education level of the research obtained with the keywords “ICT education” are given in Table 1.

**Table 1**

*The Findings of ICT Education Researches Regarding Level of Education Field, Year and Country of the Researches Conducted*

		<b>Number of Publications</b>
Year	2018	6
	2019	6
	2020	9
	2021	10
	2022	5
The country where the research is conducted	Africa	8
	America/USA	2
	Ireland	2
	Spain	12
	Nigeria	1
	Türkiye	1
	Philippine	1
	Sweden	2
	Kazakhstan	1
	Germany	3
	Finland	2
	Australia	2
	Canada	1
	Brazil	1
	Russia	1
Level of Field of Education of Research	Preschool	4
	Primary and Secondary	28
	Higher Education/University	4

Findings pertaining to the years, country, and education level of the research obtained with the keywords “digital storytelling” are given in Table 2.

**Table 2**

*The Findings of Digital Storytelling Researches Regarding Level of Education Field, Year and Country of the Researches Conducted*

		<b>Number of Publications</b>
Year	2018	5
	2019	6
	2020	8
	2021	6
	2022	2
The country where the research is conducted	England	1
	Türkiye	7
	Malaysia	2
	Cyprus	1
	Africa	2
	Italy	2
	USA	3
	Canada	1
	United Kingdom	2
	Lithuania	1
	Spain	1
	Norway	1
	Australia	3
	Tunisia	1
	Germany	1
	Austria	1
Europe	1	
Asia	1	
China	1	
Rome	1	
Level of Field of Education of Research	Primary and Secondary	11
	Higher Education/ University	14
	Migrants and Refugees	1

The number of articles have been found as 36 in total. According to Table 1, researches have been found on Education conducted as 10 of them in 2018 (e.g., Wanjiru 2018; Husnutdinova, 2018), 12 of them in 2019 (e.g., Ackah-Jnr and Danso (2019; Hellmich, Löper, and Görel, 2019), and 14 of them in 2020 (e.g., Duk and Hernández-Nail Polish, 2020; Somerton, Helmer, Kasa, Hernández-Torrano, and Makoelle, 2020). These findings show an increasing interest in education in between January 2018 and May 2022.

Most of the research includes education were conducted in Spain (12 studies) for example studies of Arnaiz and Caballero (2020) and Arnaiz Sanchez et. al (2018). Later on there was a high interest with 8 studies within Africa (e.g., Materechera, 2018; Tawodzera and Themane, 2019) and Germany with 3 studies (e.g., Paseka and Schwab,2020; Schwab et. Al 2019).

The level of the field of the education of the researches were predominantly conducted on primary and secondary students (Magumise and Sefotho, 2020; Arnaiz and Caballero, 2020). Preschool (Yıldırım Hacıbrahimoglu and Ustaoglu, 2020; Vélez, Aristizabal, and de Elejalde, 2020) and higher education level (de Espinosa, et. al, 2019; Collins, et. al, 2019) researches were relatively low compared to primary and secondary level students.

The number of articles have been found as 24 in total. According to Table 1., researches have been found on Digital Storytelling conducted as 9 of them in 2018 (e.g., Yilmaz and Durak, 2018; Goldingay, Epstein, and Taylo, 2018), 10 of them in 2019 (e.g., Zakaria and Aziz, 2019; Kevser, 2019), and 8 of them in 2020 (e.g., Conlon, Smart, and McIntosh, 2020; Tanrikulu, 2020). This shows an increasing interest in digital storytelling. The countries that had the greatest number of publications were respectively: Türkiye with 7 studies (e.g., Sevim-Cirak, 2018; Tokmak, Yakin, and Dogusoy, 2019; Saritepeci, 2020), Australia 3 studies (e.g., Taylor et al., 2018), USA 3 studies (e.g., Kim et al., 2019).

According to the level of the field of education, findings show that digital storytelling related research has been mostly conducted in the field of higher education with 14 studies (e.g., Otto, 2018; Goldingay, Epstein, and Taylor, 2018) and later 11 of them are primary and secondary (Pavlou, 2020; Zakaria and Aziz, 2019).

Findings pertaining to subjects, sample/study group, research methods and results obtained with the keywords “education, digital storytelling” are given respectively; in Table 3. and Table 4.

**Table 3**

*The Findings of “Digital Storytelling” Researches Regarding Subjects, Sample/Study Group, Research Methods and Results*

	<b>Themes</b>	<b>Number of Publications</b>
Subjects	Thoughts and Views Towards Students in the Subject of Digital Storytelling	17
	Thoughts and Views Towards Parents in the Subject of Digital Storytelling	1
	Thoughts and Views Towards Teachers in the Subject of Digital Storytelling	4
	Thoughts and Views Towards Professional Development of Individuals in the Subject of Digital Storytelling	3
	Thoughts and Views Towards Teacher Candidates in the Subject of Digital Storytelling	3
	Explore How digital learning resources (developed in the Erasmus+ ReGap Project ‘Reducing the Educational Gap for Migrants and Refugees’) to be socially included and to experience a sense of wellbeing	1
	Explore the successes and challenges associated with the digital story to support language learning and intercultural understanding	1
	Explore how an innovative methodology - digital storytelling for researching student experiences	1
Sample/Study Group	Nurse	3
	Students	18
	Student Parents	1
	Teachers	6
	Refugee Students	1
	Teacher Candidate	3
	Migrants and Refugees	1

Research Method	Qualitative Research	20
	Mixed Research Methods	5
	Quantitative Research Method	2
Results of the Research	Views and Experiences Regarding the Effectiveness of Digital Storytelling in Learning / Teaching Processes	14
	Contributions of Digital Storytelling to Student-Teacher and/or Student-Student Interaction	3
	Contributions of Digital Storytelling to Empathy Development of Individuals	1
	Contributions of Digital Storytelling to Student Motivations/Performance and Skills in Learning/Teaching Processes	6
	Contributions of Digital Storytelling to the Professional Commitment of Individuals	1
	In creating such resources as digital stories experience to refugees and migrants social inclusion and a sense of wellbeing	1
	Supporting students' learning in the areas of language, intercultural understanding and twenty-first-century skills, including digital literacies and technological skills, and helped teachers extend their pedagogical horizon.	1
	Provide the digital storytelling an effective medium for students to convey experiences	1

According to Table 3. and the subjects of the researches obtained with the keyword “ Information and Communication Technologies (ICT) Education”, it is found that most of the research subjects were views of teachers/stakeholders (14 studies) following factors affecting the learning process of students (7 studies) in education.

Most of the researches is conducted with Primary / Secondary School Teachers (16 studies), following Students (7 studies). Moreover, it is found that most of the researches was conducted in qualitative methods (23 studies) following quantitative research methods (10 studies) and mixed research methods (4 studies).

Looking at the results of the research, most of the researches highlighted the views of teachers and stakeholders on the challenges to the implementation of edu-

cation (14 studies), following factors affecting the implementation of education (8 studies), and attitudes/perceptions of students towards the application of education (7 studies).

The findings regarding the purpose of the research, obtained with the keyword “digital storytelling“, are given in Table 4. Table 4 elucidates the findings regarding challenges encountered in the integration of Information and Communication Technology (ICT), as derived from various research studies. This tabulation categorizes specific challenges, delineates their frequency across researches, and suggests potential solutions, thereby serving as an essential reference in the discourse of ICT integration in educational and organizational frameworks.

**Table 4**

*The Findings of the Challenges Encountered in ICT Integration of the Researches*

	<b>Themes</b>	<b>Number of Publications</b>
In ICT Integration of Researches Obtained with the Keyword “Digital Storytelling”	The scenarios were selected by the teaching team, introducing bias in perspective and in preference of specific forms of digital media.	1
	Unsure of Internet-Based of Security-Related Factors in Digital Storytelling Design	1
	Being Used to of Face-to-Face Training	1
	To feel at ease with the online resources from participants’ very first encounter with each course and also throughout the course.	1
	Consideration in cross-cultural digital storytelling exchanges.	1
	Students legitimately chose not to opt in to the request for further viewings of their personal stories.	1

According to Table 4. and the subjects of the researches obtained with the keyword “Digital Storytelling”, it is found that most of the research subjects were thoughts/views towards the students in the subject of digital storytelling (17 studies) (e.g., Sarıtepeci, 2020; DeLenardo, Savory, Feiner, Cretu, and Carnegie, 2019; Urs-tad, Ulfby, KBrandeggen, Bodsberg, Jensen, and Tjøflå, 2018) following thoughts

and views towards teachers in the subject of digital storytelling (4 studies) (e.g., Khalid, and El-Maliki, 2020; Polo, Iacono, Fiorentino, and Pierri, 2019; Schmoelz, 2018).

Moreover, sample/study group, 18 of them are students, 6 of them are teachers, 3 of them are teacher candidates, 3 of them are nurses, 1 of them is parents, 1 of them is a refugee student, and 1 is migrants and refugees. According to the research methods, 20 of them are qualitative research methods, 5 of them are mixed research methods, and 2 of them are quantitative research methods.

Looking at the results of the researches, it is found that the researches mostly focused on views and experiences on the effectiveness of digital storytelling in learning/teaching processes (14 studies), following contributions of digital storytelling to student motivations/performance and skills in Learning/Teaching Processes (6 studies). Lastly, various contributions of digital storytelling, such as student-teacher and/or student-student interaction (3 studies), development of empathy (1 study), the professional commitment of individuals (1 study), were overt as well.

Digital storytelling found as an approach that creates resources of social inclusion and a sense of wellbeing for refugees and migrants (1 study), supports students' learning in the areas of language, intercultural understanding, and twenty-first-century skills, including digital literacies and technological skills (1 study), and helps students to convey experiences as effective medium (1 study).

RQ2: What contexts have been the object of study in education?

The findings regarding the purpose of the research, obtained with the keyword “education”, are given in Table 5.

**Table 5**

*The Findings Regarding the Solutions for Challenges of ICT Integration and Contribution of DST for the Challenges Encountered in the ICT Integration for Inclusive Education*

	Themes	Number of Publications
DST contributions for the challenges encountered in ICT Integration of researches, obtained with the keyword "Digital Storytelling"	Evaluation of clinical competencies in health as a training / learning tool	4
	Developing original, innovative learning environments and teaching materials with authentic learning theory	1
	Presenting learner-centered contents that support the productivity of learners, and the learned knowledge contributing to production	2
	Developing the self-confidence of learners	1
	Learners' interaction with motivating activities and active participation in the classroom	2
	Planning and designing of learning environments in interaction with learners' cultural structure	1
	Positive encouragement of emotional learning in the creation of learning environment of individuals and structuring learning practices	2
	Providing a meaningful learning experience by increasing the dynamics of individuals' participation in learning environments	5
	Better understanding of the information presented and development of learning skills	6
	Increasing the motivation of students	4
	Ensuring the development of students' critical and creative thinking skills	2
	Positive effect on the cognitive and affective dimensions of learning by providing interesting and fun learning	3
	Playing an important role in showing how students with cultural experience in terms of language can relate contextually between their experiences and their school life	1
Positive effect of co-creation theory and students' participation in developing the targeted outcome with the course content and their knowledge and awareness of the course subjects	1	

Developing mutual communication skills in teacher-student interaction	3
Ensuring the development of individuals' digital skills	2
Increasing individual learning	1
Increasing student-student interaction within the group with group work	1
Providing a cooperative learning environment	2
Evaluation of the quality of the content produced in the course with the flipped learning approach and completing the learning process	1
The use of visual elements in the learning process increases the participation of students in the learning process.	1
Identification with matters of real importance were communicated by real refugees	1
New insights into the exchange of multimodal digital stories as learning activities	1
Provide effective evaluation and monitoring and resulting pedagogical and curriculum enhancements.	1

According to Table 5., findings related to the purpose of the researches, obtained on Information and Communication Technologies (ICT) education in line with the criteria determined in the research, are respectively; learning strategies (7 studies), individual learning differences (6 studies), teacher-teacher / stakeholder cooperation (5 studies), physical insufficiency of schools (4 studies), teachers' professional competencies (3 studies), migrants (2 studies), cultural diversity (2 studies), social and cultural differences (2 studies), learning materials(2 studies), assistant assistants/ shadow teachers in the learning process (2 studies), teachers 'personal characteristics (1 study), physical disability (1 study), student-student interaction (1 study), social adaptation (1 study), the interaction between groups in the learning process (1 study), and peer attitude (1 study).

RQ3: To what extent can DST contribute to solving challenges of ICT integration for education? (given in Table 4)

The findings related to the challenges encountered in the ICT integration of the researches, obtained with the keyword “education” in line with the criteria determined in the research, are respectively; lack of learning strategies suitable for individual learning differences (9 studies)(e.g., Espada Chavarría, Gallego Condo, and González- Montesino, 2019; Leiva Olivencia, Isequilla Alarcon, and Matas Terrón, 2019), lack of teacher- teacher/stakeholder cooperation (7 studies)(e.g., Duk, and Hernández-Ojeda, 2020; Somerton, Helmer, Kasa, Hernández-Torrano, and Makoelle, 2020), lack of social adaptation (6 studies)(e.g., Husnutdinova, 2018; Wanjiru, 2018 ), lack of student-student interaction (5 studies) (e.g., Alegre de la Rosa, 2019; Hankebo, 2018), lack of learning materials suitable for individual learning differences (4 studies)(e.g.,- Somerton, Helmer, Kasa, Hernández-Torrano, and Makoelle, 2020; Collins, Azmat, and Rentschler, 2019), inadequacy of teachers in terms of profession (3 studies)(e.g.,- De Souza, da Silva, and Barboza Coimbra, 2018; Mfuthwana, and Dreyer, 2018) 2 of them are the physical insufficiency of the classroom(e.g., Vélez, Aristizabal, and de Elejalde, 2020; Materechera, 2018 ), the insufficiency of the education system (2 studies)(e.g., De Souza, da Silva, and Barboza Coimbra, 2018; Materechera, 2018), the physical insufficiency of the school (2 studies) (e.g., Takala, Silfver, Karlsson, and Saarinen, 2020; Collins, Azmat, and Rentschler, 2019), lack of student-teacher interaction (1 study)(e.g., Tawodzera, and Themane, 2019), and the low-income level of refugee parents (1 study)(e.g., Tawodzera, and Themane, 2019).

Findings of the challenges encountered in the ICT integration of the researches, obtained with the keyword “digital storytelling” are respectively; being used to face-to-face training (1 study), to feel cross-at ease with the online resources from participants’ very first encounter with each course and also throughout the course (1 study), consideration in cross-cultural digital storytelling exchanges (1 study), students legitimately chose not to opt in to the request for further viewings of their personal stories (1 study).

The findings regarding the contribution of DST for the challenges encountered in the ICT integration for education (given in Table 5).

The findings of the solutions for the challenges encountered in ICT integration of the researches obtained with the keyword “education” are respectively; teacher, peer, family attitude in education (20 studies)(e.g., Vélez et al., 2020; Kirkpatrick et al., 2019; Jose Leon et al., 2018), teaching practices for individual differences (13 studies)(e.g., Vélez et al., 2020; Hellmich et al., 2019; De Souza et al., 2018), providing suitable services for education (12 studies)(e.g., Vélez et al., 2020; Altrão, and de Melo Almeida, 2019; Husnutdinova, 2018), supportive learning activities / materials (8 studies)(e.g., Vélez et al., 2020; Collins et al., 2019; Husnutdinova, 2018; Arnaiz

Sanchez et al., 2018), school environment suitable for the educational needs of all students (5 studies) (Vélez et al., 2020; Ackah-Jnr, and Danso, 2019; Majoko, 2018; Cruz Vadillo, 2018), peer coaching in terms of social interaction (4 studies)(e.g., Arnaiz, and Caballero, 2020; Wanjiru, 2018), students in need of special education studying in united classrooms in the active learning process by training with their peers (3 studies)(e.g., Tiernan et al., 2020; Wanjiru, 2018), overcoming the problems of lack of adequate time, lack of professional training focused on education and large classes (1 study)(e.g., Materechera, 2020), encouraging cooperation between teachers to teach quality lessons in classrooms where education is implemented (1 study)(e.g., Duk, and Hernández-Ojeda, 2020). the findings (Table 6), various solutions are provided in the research and findings show that in the classroom (2 studies) (Sartepeci, 2020; Zakaria, and Aziz, 2019), positive encouragement process (1 study)(Taylor et al., 2018), identification with matters of real importance were communicated by real refugees (1 study)(Svoen et al., 2019), new insights into the exchange of multimodal digital stories as learning activities (1 study)(Oakley et al., 2018), providing effective evaluation and monitoring and resulting pedagogical and curriculum enhancements study) (Austen et al., 2020), developing the self-confidence of learners (1 study)(Sartepeci, 2020), planning and designing of learning environments in interaction with learners' cultural structure (1 study) (Khalid, and El-Maliki, 2020), playing an important role in showing how experiences and their school life (1 study) (Czop Assaf, and O'Donnell, 2020), positive effect of course content and their knowledge and awareness of the course subjects (1 study) (Ferri et al., 2020), increasing individual learning (1 study) (Kaminskienė, and Khetsuriani, 2019), increasing student-student interaction within the group with group work (1 study)(Kaminskienė, and Khetsuriani, 2019), developing original, innovative learning environments and teaching materials with authentic learning theory (1 study) (Conlon et al., 2020).

## **Discussions and Conclusions**

In the digital age, content production through using ICT has become a part of daily life. Thanks to the developments in these technologies, every individual who has a mobile device equipped with basic features and an internet connection has become able to produce multimedia such as texts, sounds, videos, photographs, animations in professional quality anytime and anywhere. Despite the fact that these technologies provide great convenience to the users in content production, in terms of how to design and produce the content using ICTs, and how to use produced content in the best way, they require high-level design and management skills. ICTs to be used in education and training environments play a very important role in increasing students' interest(Pavlou, 2020; Kim et al., 2019; Schmoelz, 2018), providing motivation (Pavlou,

2020; Zakaria, and Aziz, 2019; Otto, 2018), and providing effective and meaningful learning (Pavlou, 2020; DeLenardo et al., 2019; Islim et al., 2018) based on the learning context. As one of the ways of using ICT, digital storytelling offers researchers the opportunity to carry out a versatile, project-based, rich resource access, universal interactive research. Digital storytelling provides a medium for using current multimedia opportunities as informative, entertaining, educational, or sharing experiences. Based on this context, researches conducted in different countries examined within the scope of this research, to discover the lasting challenges of ICT integration for the solution to challenges of education as well as to what extent DST can contribute to solving these challenges of ICT integration for learning and inclusion. The results of this study show an increasing interest in education in between January 2018 and May 2020.

For example 10 studies in 2018 (Wanjiru, 2018; Husnutdinova, 2018), 12 studies in 2019 (Ackah-Jnr and Danso, 2019; Hellmich, Löper, and Görel, 2019) and 14 studies in May 2020 (Duk and Hernández-Nail Polish, 2020; Somerton, Helmer, Kasa, Hernández-Torrano, and Makoelle, 2020) were conducted.

Most of the researches were conducted in Spain for example studies of Arnaiz and Caballero (2020) Arnaiz Sanchez et. al (2018). This result was followed by Africa (Materchera, 2018; Tawodzera and Themane, 2019) and Germany (Paseka and Schwab,2020; Schwab et. al 2019).

The level of the field of the education of the researches were predominantly conducted on primary and secondary students (Magumise and Sefotho, 2020; Arnaiz and Caballero, 2020). Preschool (Yıldırım Hacıbrahimoğlu and Ustaoglu, 2020; Vélez, Aristizabal, and de Elejalde, 2020) and higher education level (de Espinosa, et. al, 2019; Collins, et. al, 2019) researches were relatively low compared to primary and secondary level students.

In line with the criteria determined in the research, 9 of the researches, obtained from digital storytelling, belonged to 2018 (Yilmaz and Durak, 2018; Goldingay, Epstein, and Taylo, 2018). 10 of them belonged to 2019 (Zakaria and Aziz, 2019; Kevser, 2019), and 8 of them belonged to 2020 (Conlon, Smart, and McIntosh, 2020; Tanrikulu, 2020).

According to the level of the field of the education of the study, 11 of them are primary and secondary (Pavlou, 2020; Zakaria and Aziz, 2019), 14 of them are higher education/university (Otto, 2018; Goldingay, S., Epstein, and Taylor et. al., 2018).

The subjects of the researches obtained with the keyword “Digital Storytelling”, 17 of them are the thoughts/views towards the students in the subject of digital stor-

ytelling (Saritepeci, 2020; DeLenardo, Savory, Feiner, Cretu, and Carnegie, 2019; Urstad, Ulfby, KBrandeggen, Bodsberg, Jensen, and Tjoflå, 2018), 1 is the thoughts/views towards parents in the subject of digital storytelling (Saritepeci, 2020), 4 of them are thoughts/views towards teachers in the subject of digital storytelling (Khalid, and El-Maliki, 2020; Polo, Iacono, Fiorentino, and Pierri, 2019; Schmoelz, 2018), 3 of them are thoughts/views towards professional development of individuals in the subject of digital storytelling (Clisbee, Beierwaltes, and Eggenberge, 2019; Islim, Ozudogru, and Sevim-Cirak, 2018; Urstad, Ulfby, Brandeggen, Bodsberg, Jensen, and Tjoflå, 2018), 3 of them are thoughts/views towards teacher candidates in the subject of digital storytelling (Tokmak, Yakin, and Dogusoy, 2019; Faruk et al., 2018; Yilmaz, and Durak, 2018), 1 of them is explore how digital learning resources (developed in the Erasmus+ ReGap Project 'Reducing the Educational Gap for Migrants and Refugees') to be socially included and to experience a sense of wellbeing (Soven et al., 2019), 1 of them is explore the successes and challenges associated with the digital story to support language learning and intercultural understanding (Oakley, Pegrum, Xiong, Lim, and Yan, 2018) and 1 of them is explore how an innovative methodology - digital storytelling for researching student experiences (Austen, Pickering, and Judge, 2020).

In line with the criteria determined in the research, 10 of the researches, obtained from education belonged to 2018 (e.g., Wanjiru 2018; Husnutdinova, 2018), 12 of them in 2019 (e.g., Ackah-Jnr and Danso (2019; Hellmich, Löper, and Görel, 2019), and 14 of them in 2020 (e.g., Duk and Hernández-Nail Polish, 2020; Somerton, Helmer, Kasa, Hernández-Torrano, and Makoelle, 2020).

In line with the criteria determined in the research, the results belonging to the purpose of the studies on education; 4 of them are the physical insufficiency of schools, 2 of them are migrants, 2 of them are cultural diversity, 6 of them are individual learning differences, 2 of them are social and cultural differences, 1 of them are peer attitude, 2 of them are instructional leadership, 1 of them is the interaction between groups in the learning process, 2 of them are learning materials. 7 of them are learning strategies, 2 of them are assistant assistants/shadow teachers in the learning process, 1 of them is the personal characteristics of the teacher, 3 of them are professional competencies of teachers, 5 of them are teacher-teacher / stakeholder cooperation, 1 of them are physical disability, 1 of them is student-student interaction, and 1 of them is social adaptation. According to these results, it can be said that the success of education depends on the adaptation of the teaching environments and methods in line with the needs of the students, the professional competencies of the teachers, and the provision of equal learning opportunities to all students. In education, regardless

of the individual differences of each student and the requirements arising from these differences, the principle of receiving education in the same environment with their peers is essential (Smith, Polioyway, Patton and Dowdy 2014; Mastropicri ve Scruggs; 2010). Education does not aim to provide education by gathering all students with differences in a single environment but to provide education enriched by these differences of students in educational environments (Bauer ve Kroegeer, 2004; Sitlington, Neubert ve Clark, 2000).

The results of the challenges encountered in ICT integration of the researches obtained with the keyword “education” in line with the criteria determined in the research; 2 of them are the physical insufficiency of the classroom (Vélez, Aristizabal, and de Elejalde, 2020; Materechera, 2018), 2 of them are the insufficiency of the education system (De Souza, da Silva, and Barboza Coimbra, 2018; Materechera, 2018), 2 of them are the physical insufficiency of the school (Takala, Silfver, Karlsson, and Saarinen, 2020; Collins, Azmat, and Rentschler, 2019), 5 of them are lack of student-student interaction (Alegre de la Rosa, 2019; Hankebo, 2018), 4 of them are lack of learning materials suitable for individual learning differences (Somerton, Helmer, Kasa, Hernández-Torrano, and Makoelle, 2020; Collins, Azmat, and Rentschler, 2019), 9 of them are lack of learning strategies suitable for individual learning differences (Espada Chavarría, Gallego Condoy, and González-Montesino, 2019; Leiva Olivencia, Isequilla Alarcon, and Matas Terrón, 2019), 6 of them are lack of social adaptation (Husnutdinova, 2018; Wanjiru, 2018), 7 of them are lack of teacher-teacher/stakeholder cooperation (Duk, and Hernández-Ojeda, 2020; Somerton, Helmer, Kasa, Hernández-Torrano, and Makoelle, 2020), 1 of them is lack of student-teacher interaction (Tawodzera, and Themane, 2019), 1 of them being the low-income level of refugee parents (Tawodzera, and Themane, 2019) and 3 of them are inadequacy of teachers in terms of profession (De Souza, da Silva, and Barboza Coimbra, 2018; Mfuthwana, and Dreyer, 2018).

The results of the challenges encountered in ICT integration of the researches obtained with the keyword “digital storytelling” in line with the criteria determined in the research;; one of them is unsure of internet-based of security-related factors in digital storytelling design (Khalid, and El-Maliki, 2020) and 1 of them is being used to of face-to-face training (Daniel, 2018), 1 of them is to feel at ease with the online resources from participants’ very first encounter with each course and also throughout the course (Svoen et al., 2019), 1 of them is consideration in cross-cultural digital storytelling exchanges (Oakley et al., 2018), and 1 of them is students legitimately chose not to opt in to the request for further viewings of their personal stories (Austen et al., 2020).

In line with the criteria determined in the research, the findings of the researchers, obtained with the keyword “education”, regarding the solutions to the challenges encountered in ICT integration; 1 of them is overcoming the problems of lack of adequate time, lack of professional training focused on education and large classes (Materechera, 2020), 3 of them are students in need of special education studying in united classrooms in the active learning process by training with their peers (Tieran et al., 2020; Wanjiru, 2018), 5 of them are school environment suitable for the educational needs of all students (Vélez et al., 2020; Ackah-Jnr, and Danso, 2019; Majoko, 2018; Cruz Vadillo, 2018), 13 of them are teaching practices for individual differences (Vélez et al., 2020; Hellmich et al., 2019; De Souza et al., 2018), 8 of them are supportive learning activities / materials (Vélez et al., 2020; Collins et al., 2019; Husnutdinova, 2018; Arnaiz Sanchez et al., 2018) , 12 of them are providing suitable services for education (Vélez et al., 2020; Altrão, and de Melo Almeida, 2019; Husnutdinova, 2018), 20 of them are teacher, peer, family attitude in education (Vélez et al., 2020; Kirkpatrick et al., 2019; Jose Leon et al., 2018), 1 of them is encouraging cooperation between teachers to teach quality lessons in classrooms where education is implemented (Duk, and Hernández-Ojeda, 2020), 4 of them are peer coaching in terms of social interaction (Arnaiz, and Caballero, 2020; Wanjiru, 2018).

The results of the solutions for the challenges encountered in ICT applications of the studies obtained with the keyword “digital storytelling” in line with the criteria determined in the research; 4 of them are the evaluation of clinical competencies in health as a training / learning tool (Conlon et al., 2020; DeLenardo et al., 2019; Urstad et al., 2018), 1 of them is the developing original, innovative learning environments and teaching materials with authentic learning theory (Conlon et al., 2020), 2 of them are presenting learner-centered contents that support the productivity of learners, and the learned knowledge contributing to production (Saritepeci, 2020; DeLenardo et al., 2019), 1 of them is developing the self-confidence of learners (Saritepeci, 2020), 2 of them are Learners’ interaction with motivating activities and active participation in the classroom, (Saritepeci, 2020; Zakaria, and Aziz, 2019), 1 of them is planning and designing of learning environments in interaction with learners’ cultural structure (Khalid, and El-Maliki, 2020), 2 of them are positive encouragement of emotional learning in the creation of learning environment of individuals and structuring learning practices (Khalid, and El-Maliki, 2020; Kim et al., 2019), 5 of them are providing a meaningful learning experience by increasing the dynamics of individuals’ participation in learning environments (Pavlou, 2020; DeLenardo et al., 2019; Islim et al., 2018), 6 of them are better understanding of the information presented and development of learning skills; (Pavlou, 2020; Zakaria, and Aziz, 2019; Yilmaz, and Durak, 2018), 4 of them are Increasing the motivation of students (Pavlou, 2020; Zakaria, and

Aziz, 2019; Otto, 2018), 2 of them are ensuring the development of students' critical and creative thinking skills (Pavlou, 2020; Schmoelz, 2018), 3 of them are positive effect on the cognitive and affective dimensions of learning by providing interesting and fun learning (Pavlou, 2020; Kim et al., 2019; Schmoelz, 2018), 1 of them is playing an important role in showing how students with cultural experience in terms of language can relate contextually between their experiences and their school life (Czop Assaf, and O'Donnell, 2020), 1 of them is positive effect of co-creation theory and students' participation in developing the targeted outcome with the course content and their knowledge and awareness of the course subjects (Ferri et al., 2020), 3 of them are developing mutual communication skills in teacher-student interaction (Polo et al., 2019; Goldingay et al., 2018), 2 of are ensuring the development of individuals' digital skills (Keser, 2019), 1 of them is increasing individual learning (Kaminskienė, and Khetsuriani, 2019), 1 of them is increasing student-student interaction within the group with group work (Kaminskienė, and Khetsuriani, 2019), 2 of them are providing a cooperative learning environment (Del-Moral-Pérez et al., 2019; Otto, 2018), 1 of them is the evaluation of the quality of the content produced in the course with the flipped learning approach and completing the learning process (Tokmak et al., 2019), 1 of them is that the use of visual elements in the learning process increases the participation of students in the learning process (Taylor et al., 2018) and 1 of them is identification with matters of real importance were communicated by real refugees (Svoen et al., 2019), 1 of them is new insights into the exchange of multimodal digital stories as learning activities (Oakley et al., 2018), and 1 of them is provide effective evaluation and monitoring and resulting pedagogical and curriculum enhancements (Austen et al., 2020).

Diversity, multiculturalism, and differences in the student population in the future will be a natural feature of all schools. This course of events towards cultural pluralism and diversity will bring the organization of educational programs in accordance with content from many different cultures with it. In this regard, education practices, by accepting all kinds of individual differences, should be in a way that education curriculum and applications each student can reach the best of their potential abilities (Petty, 2009; Tummoons, 2009). Therefore, the role of teacher-student interaction in this educational approach is very important in the implementation of an education system. Because when students with different stories and characteristics are in the same environment, the most important observer of the performance is the teacher. Teachers can interpret the relationships of students with their peers by observing their achievements, game skills and styles, and communication skills in the best manner. Besides, teachers can encourage parents to participate in education, and acquire information from them about their children, also share resources and time with them to improve

their children's education, so that the optimum possible learning for children can be provided. Therefore teacher educators should seek ways to support their students to make their learning more significant throughout diverse opportunities. For example, Park (2019) discussed the value of the project composed of a reflection paper and digital storytelling which enabled pre-service teachers of English for Speakers of Other Languages (ESOL) to make connections between their content knowledge, linguistic and cultural experiences, and future teaching. In the review research conducted by Greene, Burke, and McKenna (2018), with the use of digital media such as digital storytelling, photography, and the sound by young people with a different language, culture, race, and life practices, are stated to be important in the development of reflective thinking skills and communication skills among young people.

Another crucial point is that measures should be taken both at the whole school level and the classroom level in the implementation of education systems. According to Forlin et al. (2013), the measures to be taken at all school levels mainly include ensuring equal access to learning opportunities and establishing the necessary supportive structures for education. In-class measures include the diversification of the programs, the preparation of individualized education programs, and concentrating upon a quality teaching for all students. Accordingly, education focuses on the necessity of providing an equal and quality education to students with different characteristics and subject of the possible methods and ways for it to take place. Individual needs can be welcomed by giving everyone compromise, not by determining who will do what and not by distributing roles to them (Florian, 2015).

As one of the integration of ICT tools, digital storytelling is emerging in the field of education as a new technology that supports learning by exploring and experiencing and promoting learning equally. In this sense, using digital storytelling applications in education can be an affective way, especially for individuals who learn better through visual and concrete experiences. Digital storytelling practices can be used affectively in the education of students who have insufficient social interaction and communication skills or have different special needs. Besides, by creating a unique learning environment suitable for various learning styles in digital storytelling applications, learners will be able to receive individualized education at their own pace. In this context, digital storytelling practices in education can be used as an effective tool in differentiating teaching according to the learning characteristics of students, and thus, regardless of the difference, all students will benefit the most from the education provided.

ICT integration should be considered in a holistic way by considering all learning domains which usually neglects the affective dimension. The educational ob-

jectives are classified as cognitive, affective, psychomotor domains (Bloom, et al., 1956). Smith and Ragan (1999) highlights that “any ‘cognitive’ or ‘psychomotor’ objective has some affective component to it. Although affective domain is too important to ignore when integrating ICT into education, meeting affective domain objectives is often a challenge which can be contributed by DST.

Different skills and competencies such as technology use competence, multi-faceted literacy skills, multicultural perspective, critical thinking skills, problem-solving skills, and competence to present different perspectives consist of an applied process (Lambert, 2007).

The implications of these researches; It is thought that it could be important in terms of emphasizing both the motivating aspects and shortcomings of the applications of digital storytelling in education for educators, relevant stakeholders and those who want to do research on this subject.

### **Suggestions**

The study presents systematic reviews of 63 studies on ICT Education (36 study), Digital Storytelling (24 study). In addition, since it is limited to three research questions within the scope of the study, it cannot be said to include all articles in the field of digital storytelling. It is thought that this conducted systematic research of compilation would contribute to educational sciences and technologies by shedding light on new research about the application of the method of digital storytelling, which is one of the ICT integration tools in education, and applications related to the subject.

In recent years, the increase in the number of academic studies dealing with digital storytelling in the field of educational sciences and the diversification of the source countries where academic researches are produced have expanded and enriched the relevant literature. Accordingly, it has been observed that there has been an increase in systematic compilation studies recently to reveal the trends in the literature.

When the relevant systematic review studies are examined, it is seen that a significant part of these studies benefit from the descriptive content analysis method (Yang, Chen, and Hung, 2020; Wu and Chen, 2020; Şimşek, Koçak-Usluel, Sarıca-Çıra, Tekeli, 2018; De Jager, Fogarty, Tewson, Lenette, and Boydell, 2017; Çıralı and Koçak-Usluel, 2015; Psomos, and Kordaki, 2012). Systematic review oriented descriptive content analysis studies are important in terms of summarizing the current situation of the literature on the subject under investigation and revealing the deficiencies in the field to guide future researches. Descriptive content analysis is mostly used to determine the status of academic studies on a specific subject related to the purpose

and method. Thus, it becomes an effective method in determining the development level of the method used in educational research, its suitability for the field, and its strengths and weaknesses. As a result, such studies increase the quality of theoretical and empirical research and contribute to the knowledge in the field of education.

The research's main topic, education, is an approach that supports the intellectual and social growth of every student, regardless of their unique characteristics or inadequacies, by modifying the educational curriculum in general education classrooms. Arrangements and changes in the curriculum, resources, and teaching strategies should be made in accordance with each student's needs in order for them to all benefit from the general education program. Teaching techniques used in education as well as teaching techniques used in general education should be used, and assistive technologies should be used to increase access for students to the curriculum. A qualified workforce should be trained both before and throughout the service, and solidarity and collaboration amongst all staff members who have a role in the process, such as instructors, therapists, nurses, and consultants, should be ensured. Peers with normal development should be assigned jobs in the educational process such as teacher, assistant, reader, and guide, and support from peers and families should be gained at every level of the process (Yücesoy Özkan, Kırkgöz and Beşdere, 2019; Alquraini ve Gut, 2012).

Many scientific investigations on the ideas of inclusion and integration have been conducted since the 1980s, according to research studies and compilations in the national literature. Certain research can be linked to the elements of education, even though the number of studies directly based on education is small in these studies, which are primarily descriptive (access, participation and support). Future research must in this regard concentrate on the fundamentals of education, look at methods that will increase active involvement and access to learning settings, and assist the development of infrastructures that will support educational practices.

## References

- Alquraini, T., and Gut, D. (2012). Critical components of successful inclusion of students with severe disabilities: Literature review. *International Journal of Special Education*, 27(1), 42-59.
- Austen, L., Pickering, N., and Judge, M. (2020). Student reflections on the pedagogy of transitions into higher education, through digital storytelling. *Journal of Further and Higher Education*, 1-12.
- Barrett, H. (2006). Researching and evaluating digital storytelling as a deep learning tool. In. C. Crawford (Ed.), *Proceedings of society for information technology*

*and teacher education international conference* (pp. 647-654). Chesapeake, VA: AACH.

- Bauer, A. M., and Kroeger, S. (2004). *Inclusive classrooms: Video cases on CD-Rom activity and learning guide* (Vol. 1). Saddle River, NJ: Pearson.
- Bloom, B.S. (Ed.). Engelhart, M.D., Furst, E.J., Hill, W.H., and Krathwohl, D.R. (1956). *Taxonomy of educational objectives, handbook I: The cognitive domain*. David McKay Co Inc.
- Çalık, M., and Sözbilir, M. (2014). Parameters of content analysis. *Education and Science*, 39(174), 33-38.
- Çıralı, H., and Koçak-Usluel, Y. (2015). *A descriptive review study about digital storytelling in educational context*. In 7th International Conference on Education and New Learning Technologies (EDULEARN15), Barcelona, Spain.
- De Jager, A., Fogarty, A., Tewson, A., Lenette, C., and Boydell, K. M. (2017). Digital storytelling in research: A systematic review. *The Qualitative Report*, 22(10), 2548-2582.
- Erişti, B. (2010). Eğitimde dönüşümler. H. F. Odabaşı (Ed.), *Bilgi ve İletişim Teknolojileri Işığında Dönüşümler* içinde (s. 1-112). Nobel Yayın Dağıtım.
- Florian, L. (2015). Conceptualising pedagogy: the inclusive pedagogical approach in action. In J.M. Deppele, T. Loreman, R. Smith, L. Florian (Eds.) *Inclusive pedagogy across the curriculum* (pp.11-24). Emerald Group Publishing Limited.
- Forlin, C., Chambers, D., Loreman, T., Deppeler, J., and Sharma, U. (2013). *Education for students with disability: A review of the best evidence in relation to theory and practice*. Braddon, ACT: Australian Research Alliance for Children and Youth.
- Frazel, M. (2010). *Digital storytelling guide for educators* (1<sup>st</sup> ed.). Eugene, Or: International Society for Technology in Education.
- Gils, F. (2005). Potential applications of digital storytelling in education. In 3<sup>rd</sup> Twente Student Conference on IT (pp.17-18). University of Twente Faculty of Electrical Engineering, Mathematics and Computer Science, Ensched.
- Greene, S., Burke, K. J., and McKenna, M. K. (2018). A review of research connecting digital storytelling, photovoice, and civic engagement. *Review of Educational Research*, 88(6), 844-878.

- Hallinger, P. (2013). A conceptual framework for systematic reviews of research in educational leadership and management. *Journal of Educational Administration*. <https://www.emerald.com/insight/content/doi/10.1108/09578231311304670/full/html>
- Hallinger, P. (2018). Surfacing a hidden literature: A systematic review of research on educational leadership and management in Africa. *Educational Management Administration and Leadership*, 46(3), 362-384.
- Harris, K., Marcus R., and McLaren K. (2001). Curriculum material\* supporting problem based teaching. *School Science and Mathematics*, 101(6), 310-315.
- Ivankovic, A., Spiranec, S., and Miljko, D. (2013). Student's level of ict literacy by study groups on faculty of philosophy, University of Mostar. In *Information and Communication Technology Electronics and Microelectronics (MIPRO)*, 2013 36th International Convention on (pp. 605-609). IEEE.
- Kitchenham, B. (2004). *Procedures for performing systematic reviews* [Unpublished PhD Thesis]. Keele University National ICT Australia Ltd, Australia.
- Lambert J. (2007). *The digital storytelling cookbook*. Berkeley, CA: Center for Digital Storytelling/Digital Diner Press.
- Loreman, T.J., Forlin, C., Chambers, D., Sharma, U., Deppelen J. M. (2014). Conceptualising and measuring education. In C. Forlin and T. Ixireman (Eds.), *Measuring education* (s. 3-17). UK: Emerald Group Publishing Limited.
- Mastropieri, M. A., and Scruggs, T. E. (2010). *Vie classroom: Strategies for effective differentiated instruction*. Upper Saddle River, NJ: Pearson Education, Inc.
- Meadows, D. (2003). Digital storytelling: Research-based practice in new media. *Visual Communication*, 2(2), 189-193.
- Miles, M. B., and Huberman, A. M. (2015). Nitel veri analizi (Çev. S. Akbaba Altun and A. Ersoy). Pegem Akademi.
- Mordal, K, N., Stremstad, M. (1998). Norway: Adapted education for all? In T. Booth ve M. Ainscow (Eds.), *From them to us: An international study of inclusion in education* (s. 220-230). Psychology Press.
- Oakley, G., Pegrum, M., Xiong, X. B., Lim, C. P., and Yan, H. (2018). An online Chinese-Australian language and cultural exchange through digital storytelling. *Language, Culture & Curriculum*, 31(2), 128-149.

- Ohler, J. (2008). *Digital storytelling in the classroom. New media pathways to literacy, learning, and creativity*. Thousand Oaks: Corwin Press.
- PRISMA (2020). Transparent reporting of systematic reviews and meta-analyses. <http://www.prisma-statement.org/PRISMAStatement/PRISMAStatement>
- Park, H. R. (2019). ESOL pre-service teachers' experiences and learning in completing a reflection paper and digital storytelling. *Australasian Journal of Educational Technology*, 35(4), 63-77.
- Petty, G. (2009). *Teaching today a practical guide* (4<sup>th</sup> Edition). Cheltenham: Nelson Thornes.
- Porter, G.L. and Smith, D. (2011). *Exploring educational practices through professional inquiry*. Sense Publishers.
- Psomos, P., and Kordaki, M. (2012). Pedagogical analysis of educational digital storytelling environments of the last five years. *Procedia-Social and Behavioral Sciences*, 46, 1213-1218.
- Robin, B. R. (2008). Digital storytelling: A powerful technology tool for the 21<sup>st</sup> century classroom. *Theory Into Practice*, 47,220-228.
- Rose, D. H., and Strangman, N. (2007). Universal design for learning: Meeting the challenge of individual learning differences through a neurocognitive perspective. *Universal Access in the Information Society*, 5(4), 381-391.
- Rose, R. (2001). Primary school teacher perceptions of the conditions required to include pupils with special educational needs. *Educational Review*, 53(2), 147-156.
- Shaddock, A., Giorcelli, L. and Smith, S. (2007). Students with disability in mainstream classrooms. Erişim tarihi 26.06.2020, <http://www.ndco.stepscs.net.au/pdf/Strategies%20for%20teachers%20in%20mainstream%20classrooms%20booklet.pdf>.
- Sitlington, P. L., Clark, G. M., and Kolstoe, O. P. (2000). *Transition education and services for adolescents with disabilities*. MA: Allyn and Bacon.
- Smith, P. and Ragan, T.J. (1999). *Instructional design*. John Wiley and Sons.
- Smith, T. E. C., Polioway, E., Patton, J. R., and Dowdy, C. A. (2014). *Teaching students with special needs in settings* (4<sup>th</sup> Edition). MA: Pearson Education, Inc.

- Spence- Cochran, K., Pearl, C. E., and Walker, Z. (2013). Full inclusion into schools: Strategies for collaborative instruction. In P. Wehman (Ed.) *Life beyond the classroom: Transition strategies for young people with disabilities*, (pp. 175-195). 4th. Edition. Baltimore, MD: Paul H. Brookes Publishing Co.
- Svoen, B., Dobson, S., and Bjørge, L. T. (2019). Let's talk and share! Refugees and migrants building social inclusion and wellbeing through digital stories and online learning resources. *International Journal of ICT Education*, 1-14.
- Şimşek, B., Koçak-Usluel, Y., Sarıca-Çıra, H. and Tekeli, P. (2018). Türkiye’de eğitimsel bağlamda dijital hikâye anlatımı konusuna eleştirel bir yaklaşım. *Eğitim Teknolojisi Kuram ve Uygulama*, 8(1), 158-186.
- Thomas, J., and Harden, A. (2008). Methods for the thematic synthesis of qualitative research in systematic reviews. *BMC Medical Research Methodology*, 8(45), 1-10.
- Tummons, J. (2009). *Curriculum studies in the life long learning sector*. SAGE Publishing.
- UNICEF (2013). The state of the World’s children 2013: Children with disabilities. [https://www.unicef.org/publications/index\\_69379.html](https://www.unicef.org/publications/index_69379.html)
- Wu, J., and Chen, D. T. V. (2020). A systematic review of educational digital storytelling. *Computers and Education*, 147, 103786.
- Yang, Y. T. C., Chen, Y. C., and Hung, H. T. (2020). Digital storytelling as an interdisciplinary project to improve students’ English speaking and creative thinking. *Computer Assisted Language Learning*, 1-23.
- Yücesoy Özkan, Ş., Kırkgöz S., and Beşdere, B. (2019). Normalleştirmeden kapsayıcı eğitime: tarihsel gelişim. İçinde, H. Gürgür and S. Rakap (Ed.) *Kapsayıcı Eğitim Özel Eğitimde Bütünleştirme* (1. Baskı, ss. 19-56). Pegem Akademi Yayıncılık.