THE META-SYNTHESIS OF DIGITAL STORYTELLING STUDIES IN K-12

A THESIS SUBMITTED TO
THE GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES
OF
MIDDLE EAST TECHNICAL UNIVERSITY

BY

SABA ÖZ

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR
THE DEGREE OF DOCTOR OF PHILOSOPHY
IN
COMPUTER EDUCATION AND INSTRUCTIONAL TECHNOLOGY

JULY 2019

Approval of the thesis:

THE META-SYNTHESIS OF DIGITAL STORYTELLING STUDIES IN K-12

submitted by **SABA ÖZ** in partial fulfillment of the requirements for the degree of **Doctor of Philosophy in Computer Education and Instructional Technology Department, Middle East Technical University** by,

Prof. Dr. Halil Kalıpçılar
Dean, Graduate School of **Natural and Applied Sciences** _____

Prof. Dr. Ömer Delialioğlu
Head of Department, **Comp. Edu. and Inst. Tech.** _____

Prof. Dr. Zahide Yıldırım
Supervisor, **Comp. Edu. and Inst. Tech., METU** _____

Examining Committee Members:

Assoc. Prof. Dr. Serpil Yalçınalp
Comp. Edu. and Inst. Tech., Başkent University _____

Prof. Dr. Zahide Yıldırım
Comp. Edu. and Inst. Tech., METU _____

Prof. Dr. Soner Yıldırım
Comp. Edu. and Inst. Tech., METU _____

Assist. Prof. Dr. Halil Ersoy
Comp. Edu. and Inst. Tech., Başkent University _____

Assist. Prof. Dr. Göknur Kaplan
Comp. Edu. and Inst. Tech., METU _____

Date: 17.07.2019

I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

Name, Surname: Saba Öz

Signature:

ABSTRACT

THE META-SYNTHESIS OF DIGITAL STORYTELLING STUDIES IN K-12

Öz, Saba
Doctor of Philosophy, Computer Education and Instructional Technology
Supervisor: Prof. Dr. Zahide Yıldırım

July 2019, 261 pages

Digital storytelling is one of the well-known powerful teaching and learning strategies among educational institutions, organizations and school environments. Perhaps the most important factors that make digital storytelling highly preferred and popular are its being easily producible without requiring someone to be a media professional by the help of easily learned and used software, and its coinciding with some well-known instructional and learning theories such as self-directed learning, case-based reasoning, constructionism, and narrative paradigm. The purpose of this study is two-fold; to reveal a holistic perspective about educational use of digital storytelling and to reveal a framework for future use and research of digital storytelling in educational settings. For this purpose, a two-phase narrative qualitative study design was employed for the study. Within this scope, meta–synthesis and narrative research design are research methodologies used respectively for both parts of the study. Accordingly, systematic review of digital storytelling literature in education is the data collection method for the first part of the study while interviewing is the data collection method for the second part of the study. Similarly, samples of the study change for each part as follows; 60 publications about educational use of digital storytelling for first part and 13 experts in the field of digital storytelling for the second part. Thematic analysis was used as the data analysis method for both parts of the study. Findings of the first part of the study have revealed that achievement, skill use, language learning, motivation

and technology integration are the most frequently investigated constructs by scholars in the educational digital storytelling publications. Furthermore, constructivism and multi-literacy pedagogy are the most frequently preferred theoretical bases among these publications. Participant selection among these studies varies and grade 6 to 8 and grade 1 to 5 are the most investigated target groups. Findings of the second part of the study have revealed that for the future studies, researchers should investigate constructs which are skill use (problem solving skills, creative thinking skills, ICT skills and etc.), experience, learning outcomes and psychological aspects. From the theoretical perspective, constructivism and collaborative learning are the most suggested theoretical bases for future implementation and research of digital storytelling in the educational settings.

Keywords: Meta-synthesis, Digital Storytelling.

ÖZ

K-12 DÜZEYİNDE DİJİTAL HİKÂYE ANLATIMI ÇALIŞMALARININ META-SENTEZİ

Öz, Saba
Doktora, Bilgisayar ve Öğretim Teknolojileri Eğitimi
Tez Danışmanı: Prof. Dr. Zahide Yıldırım

Temmuz 2019, 261 sayfa

Dijital hikâye anlatımı eğitim kurumları, organizasyonları ve okul ortamında iyi bilinen nitelikli öğretim ve öğrenme stratejilerinden biridir. Belkide dijital öykülemeyi oldukça tercih edilen ve popüler kılan en önemli faktörler, medya uzmanı olmadan kolayca öğrenilen ve kullanılan yazılımlar sayesinde kolayca üretilebilir olması ve kendi kendine öğrenme (self-directed learning), durum tabanlı çıkarsama (case-based reasoning), yapılandırmacılık (constructionism), hikaye paradigma (narrative paradigm) gibi tanınmış öğretim ve öğrenme kuramları ile örtüşmesidir. Bu çalışmanın amacı iki aşamalıdır; dijital hikâye anlatımının eğitsel kullanımı hakkında bütünsel bir bakış açısı sunmak ve eğitsel ortamlarda dijital hikâye anlatımının gelecekteki kullanımı ve araştırması için çerçeve sunmak. Bu amaçla, iki aşamalı anlatı nitel araştırma deseni uygulanmıştır. Bu bağlamda, sırasıyla meta-sentez ve anlatı araştırma deseni çalışmanın iki aşaması için kullanılan araştırma metedolojisidir. Dolayısıyla, dijital hikâye anlatımı eğitim alanyazınının sistematik incelenmesi çalışmanın ilk kısımı için veri toplama yöntemiyken, görüşme ise ikinci kısımın veri toplama yöntemidir. Benzer şekile, çalışmanın örneklemi ilgili kısıma göre değişmektedir; ilk kısım için örneklemi dijital hikâye anlatımının eğitimsel kullanımına yönelik 60 yayın oluştururken, ikinci kısımın örneklemini 13 alan uzmanı oluşturmaktadır. Veri analiz yöntemi olarak her iki kısım için tematik analiz yöntemi kullanılmıştır. Çalışmanın ilk kısmına yönelik bulgular başarı, beceri kullanmı, dil öğrenimi, motivasyon ve

teknoloji entegrasyonunun araştırmacılar tarafından eğitimsel dijital hikaye anlatımı çalışmalarında sıklıkla araştırılan değişkenler olduğunu söylemektedir. Buna ek olarak, yapılandırmacılık ve çoklu-okuryazarlık pedagoji bu yayınlarda en çok tercih edilen kuramsal dayanaklardır. Bu çalışmalardaki katılımcı seçimi en çok kademe 6-8 arası ve kademe 1-5 arası olarak değişmektedir. İkinci kısımın bulguları ise araştırmacıların beceri kullanımını (problem çözme becerisi, yaratıcı düşünme becerisi ve bilgi ve iletişim teknolojileri kullanma becerisi vs.), deneyimi, öğrenme çıktılarını ve psikolojik yönleri araştırmaları gerektiğini söylemektedir. Teorik perspektiften bakılacak olursa, yapılandırmacılık ve işbirlikçi öğrenme gelecekteki eğitim ortamlarındaki dijital hikâye anlatımı uygulaması ve araştırması için en çok tavsiye edilen kuramsal dayanaklardır.

Anahtar Kelimeler: Meta-Sentez, Dijital Hikâye Anlatımı.

To my wife, Yeliz Güçer Öz, Öz and Güçer Family,

and Yegâh Turkish Music Association

ACKNOWLEDGEMENTS

I wish to express my warmest and deepest gratitude to my supervisor, Prof. Dr. Zahide Yıldırım for her invaluable contribution, encouragement, feedback, patience and guidence throughout the process of completing this dissertation. Without her contribution, it would not have been possible to complete this process. I would also like to express my sincere thanks to my thesis observation and thesis defense committee members, Prof. Dr. Soner Yıldırım, Assoc. Prof. Dr. Serpil Yalçınalp, Assist. Prof. Dr. Halil Ersoy, and Assist. Prof. Dr. Göknur Kaplan for their valuable comments and critisim.

I also thank my close friends from PhD. education, Zafer Kadırhan, Yunus Alkış, Cemil Yurdagül and Mustafa Şat for their moral support. I owe my special thanks to Zafer Kadırhan for his extra support during thesis submission process. Without his technical and guiding support during thesis submission process, I may get confused. I need to express my special thanks to Kamuran Özlem Uzer for her invaluable support in English proof reading during thesis submission process.

I would also like to express my deepest and sincere thanks to my wife, Yeliz Güçer Öz for her invaluable moral support everytime I need it during the whole process. I also want to thank Öz family members; especially Segah Öz, Neva Öz, Mahur Öz, Uğur Öz, Nurcan Öz, Ayşegül Ünal Öz, Selma Öz and Güçer family members; especially Saliha Güçer, Fatih Güçer, Can Güçer and Burcu Güçer for their sincere support.

Last, but not least, I want to express my warmest and deepest thanks to Yegâh Turkish Music Association members; Oğuz Altın, Zeynep Sertyel, Nükhet Gürsu Sayan, Yurdagül Özsoy, Nazlı Şenocak, Nur Toklucu, Münire Yalçın, Betül Arı, Çetin Eldem, Gurur Güneş, Halil İbrahim Güneş, Merve Güneş and Tolga Ceyhan for their moral support during thesis completion process.

TABLE OF CONTENTS

LIST OF TABLES

TABLES

LIST OF FIGURES

FIGURES

CHAPTER 1

INTRODUCTION

Digital storytelling ,or telling a story by using digital technologies, is one of the most well-known powerful teaching and learning strategies among educational institutions, organizations and school environment as it engages both teachers and their students (Robin, 2008). Perhaps, the most important factors that make digital storytelling to be highly preferred and popular are its being easily producible without requiring someone to be a media professional by the help of easily learned and used software and its coinciding with some well-known instructional and learning theories such as self-directed learning, case-based reasoning, constructionism and narrative paradigm. Unequivocally, digital storytelling has positive impacts on students' literacy skills such as writing skills, reading skills, technology skills and interpersonal skills etc. Digital storytelling is also conceptualized as Digi-tales (Alcantud-Díaz, 2013), digital documentaries, computer-based narratives, digital essays, electronic memoirs, interactive storytelling etc. (Daniels, 2013; Rahimi & Yadollahi, 2017). Its origin is based on early 1990s through foundation of the Center for Digital Storytelling in Berkeley, CA by media and performing artists Joe Lambert and the late Dana Atchley (Alrutz, 2015). Digital storytelling is used for different kinds of purposes such prominent ones as using as a tool to digitalize children's classical tales for the purpose of learning both language and life (Alcantud-Díaz, 2013) to engage students in exploring their multiple literacies and identities (Angay-Crowder, Choi, & Yi, 2013) as a way of presenting students' learning outcomes or as a way of experiencing through inquiry of facts, problems or real life situations within the framework of design-oriented pedagogy (Anu, Jorma, & Sinikka, 2014), to enhance learners' reading and writing skills competence in English (Batsila & Tsihouridis, 2016), to build and

develop learning identities, agency and digital competences (Bjørgen, 2010) and to record memories of a community (Sukovic, 2014a).

1.1. Background of the Problem

Although digital storytelling is a highly preferred teaching and learning method among instructors and school policies, according to Robin (2008) theoretical background behind it is not considered so much by his words "…until recently, little attention has been paid to a theoretical framework that could be employed to increase the effectiveness of technology as a tool in a classroom environment" (p. 220). He also strengthens the importance of using theoretical framework behind the digital storytelling by stating that "this technology although powerful, is currently being used in K–12 and higher education classrooms with an emphasis on technical skills and without the greater level of thought and consideration to the subject matter, the teaching strategies, and the real world needs of today's classrooms" (p .226). In addition to the above reported claims made by (Robin, 2008), digital storytelling is more than a simple integration of technology into the classroom environment by digitizing storytelling process, and it should be based on a theoretical background that encompasses teaching strategies, subject matter consideration and environmental needs of classrooms. In fact it is possible to associate digital storytelling with some well-known theories by looking at related literature. For instance, Angay-Crowder et al. (2013) based digital storytelling on a *theory of pedagogy* developed and advocated by the New London Group (NLG, 1996) that integrates four components as (a) situated practice; (b) overt instruction; (c) critical framing; and (d) transformed practice. *Situated practice* is an "…immersion in meaningful practices within a community of learners who are capable of playing multiple and different roles based on their background and experiences" (NLG, 1996, p. 85). In situated practice, communities of learners involve experts who are masters of certain practices (p.85), and as a result they are made sense of as "masters of practice" (p. 84). However, an efficacious pedagogy must involve "critical understanding" which means "conscious awareness

and control over the intra-systematic relations of a system", and immersion does not provide this (p. 85). Therefore, there is a need for collaboration in practice as a foundation of learning, (p. 85) which is the key point of overt instruction. *Overt instruction* does not imply "direct drills or rote memorization" , rather it involves those type of "active interventions on the part of the teacher and other experts that scaffold learning activities that focus the learner on the important features of their experiences and activities within the community of learners" (p. 86). *Critical framing* help learners "frame their growing mastery in practice (from Situated Practice) and conscious control and understanding (from Overt Instruction) in relation to the historical, social, cultural, political, ideological, and value-centered relations of particular systems of knowledge and social practice" (p. 86). The main purpose of critical framing is to guide learners to "gain the necessary personal and theoretical distance from what they have learned, constructively critique it, account for its cultural location, creatively extend and apply it, and eventually innovate on their own within old communities and in new ones." (p. 86). Learners should be able to demonstrate the implemention of what they understood and learned through overt instruction and critical framing in practices that "help them simultaneously to apply and revise" (p. 87). *Transformed practice* involves "students' transfer, reformulation, and redesign of existing texts and meaning-making practice from one context to another. A certain degree of tension exists when students engage in transformed practice, especially when they juxtapose and integrate diverse discourses and remake their own realities or discourses to suit their needs and purposes" (Angay-Crowder et al., 2013, p. 38). Therefore, the key elements of transformed practice are "juxtaposition, integration, and living with tension". (NLG, 1996, p. 87). Digital storytelling involves these four components of efficacious pedagogy since it allows learners to face or inquire problems, facts and experience of specific topics from the beginning point of writing scripts of story to presenting their experience through 2 or 3 minute digital videos that were created by them. Moreover, storytelling whether created in digital environment or not "asks students to reflect on what they know, to examine their assumptions, and through a cyclical process of

revision, to record their cognitive development processes" (Anu et al., 2014, p. 585). While reflecting their understandings encapsulates situated practice and overt instruction of theory of pedagogy by the help of an expert person or a facilitator such as a teacher scaffolding students in scripting process of story or technological troubles, a cyclical process of revision encompasses transformed practice and critical framing of the theory. While learners are handling the re-structuring text-based free writing into a storyboard, which makes them formulate various modes of expression, they actually become involved in a transformed practice component of a theory of pedagogy at the same time (Angay-Crowder et al., 2013).

In addition to theory of pedagogy, Robin (2008) associates digital storytelling with the *Technological, Pedagogical Content Knowledge (TPCK)* by claiming that "…digital storytelling in education as earlier described with the theoretical framework of TPCK" (p. 227). Mishra and Koehler (2006) describes TPCK as an "emergent term of knowledge" by claiming that it goes beyond all three components, namely content, pedagogy and technology and is "…different from knowledge of a disciplinary or technology expert and also from the general pedagogical knowledge shared by teachers across disciplines" (p. 1028-1029). Another definition of TPCK made by Thompson & Mishra (2007) as "the three kinds of knowledge (Technology, Pedagogy and Content) that we believe are essential building blocks for intelligent technology integration. These three knowledge domains should not be taken in isolation, but rather that they form an integrated whole, a "Total PACKage" as it were, for helping teachers take advantage of technology to improve student learning" (p. 38). Digital storytelling, as is evident from its name, is integrating technology into storytelling process in order to enable learners (or story creators) to create their stories about inquiry of something related to course content or experience of real life with the help of current technological tools. However, it should not be understood that digital storytelling is just for digitizing narratives or story scripts created by learners, rather it should be treated as a way of learning through expressing ideas, experiences and understandings and presenting findings in an active learning environment through which learners

organize their knowledge (Hung, Hwang, & Huang, 2012) by current technological aids. Therefore, digital storytelling can be linked to TPCK as it implies creating stories of learners about assigned course contents according to their grade level (content knowledge) by inquiry or discovering them (pedagogical knowledge) in digital environment with appropriate story creating software and tools (technological knowledge).

Baim (2015) linked digital storytelling to *self-directed learning* by providing its definition from Knowles (1975) as "… a process in which individuals take the initiative with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating outcomes" (p. 2) By this definition, it can be thought that self-directed learning puts its basis on the constructivist theory of learning whereby "…the learner "constructs" his or her understanding of the environment from his or her interactions with it rather than the environment creating new stimulus-response connections" (Svinicki, 2010, p. 74) by the help of the instructor who simply provides a rich environment from which the learner can learn (Svinicki, 2010). Since learners design their own story by using story creating tools and software, they are subjected to self-directed learning as well. In the storytelling process, learners write their own script and support it by selecting appropriate images, pictures and videos. To do so, they manage their learning and organizing knowledge which best fits the aim of self-directed learning.

Even though such theoretical bases are mentioned in the literature, there are no holistic research studies in the field of education to see what has been studied in regard to digital storytelling. Because of that, digital storytelling research in the related literature shows a lack of holistic approach that combines individual primary studies to provide researchers with the opportunity of looking at what is inspected, which methodology is used, what theoretical underpinnings are used and what aspect of digital storytelling is taken into consideration by scholars.

1.2. Statement of the Problem

Unequivocally, there is a need for reviewing the literature while conducting a research in order to see what has been studied about the research topic up to a time of research being conducted. A literature review is defined as "the process of conducting surveys of previously published material" (The American Psychological Association's PsycINFO reference database; as cited in; Cooper, Hedges, & Valentine, 2009, p. 4) . It might address (1) to integrate and explore what has been done and said previously by others that is "believed to relate to a common topic" (Cooper et al., 2009, p. 4), (2) to criticize or interpret previous scholarly works, in other words, "to critically analyze the existing literature" (Cooper et al., 2009, p. 5), (3) to build a bridge between related topic areas from past to now, (4) to figure out or identify critical issues and trend topics in the field (Cooper, 2010) and even (5) to examine the reasons why different scientific studies pointing the same research question sometimes reach different conclusions (Petticrew and Roberts, 2006). The most common property of literature review that is involved in many literature review definitions is that literature review is "not based primarily on new facts and findings, but on publications containing such primary information, whereby the latter is digested, sifted, classified, simplified, and synthesized" (Manten 1973, as cited in; Cooper et al., 2009, p. 4). Furthermore, most literature reviews center on one or more of areas as follows; "the findings of individual primary studies; the methods used to carry out research; theories meant to explain the same or related phenomena; and the practices, programs, or treatments being used in an applied context" (Cooper et al., 2009, p. 4). By depending on researcher's intention, literature review process can be detailed or complicated or more general. Even the research topic might be a detailed review of literature with respect to specific topics that are termed by scholars as a research synthesis, a systematic review of literature or most commonly named as a meta-analysis. By thinking of digital storytelling literature, it is observed that there are many studies conducted for different purposes such as increasing motivation toward technology use and improvement of literacy skills and etc. However, in the literature of education, there seems to be no study that

investigates all the digital storytelling studies in order to build a bridge between past and current time and to give a direction to the future research studies or implementations of digital storytelling in educational settings. Hence, there emerges an important gap in digital storytelling literature with respect to overall investigation of digital storytelling studies.

1.3.Purpose of the Study

The purpose of current study is two-fold; in the first part of the study, the aim is to conduct meta-analytic research about digital storytelling. Within the scope of this aim, the plan is to deeply inspect studies in order to reveal general overview of studies about digital storytelling by constructing a framework. The second part of the study aims to find out opinions of field experts qualified on digital storytelling about future implementations of digital storytelling in the field of education.

1.4.Research Questions

Throughout the study, the aim is to find an answer to the following research questions;
RQ1. What are the characteristics of research studies about digital storytelling in K-12 education level?
RQ2. What are the researchers' opinions about the kinds of research studies needed in digital storytelling?

1.5. Significance of the Study

Meta-analysis is the best way to look at what has been inspected and criticized scholarly, and to construct a bridge between past and now in terms of the specific topic since it serves as a useful tool for analyzing and synthesizing the results of numerous studies on a particular topic (Bowman, 2012) to reach an overall conclusion. In the literature, there is no meta-analytic study conducted for the overall inspection of educational use of digital storytelling. Therefore, with this meta-analytic study, the aim is to fill this gap in related literature. The findings of this study will help build a bridge between existing and future research studies in digital storytelling.

In addition, like all other meta-analytic studies, this study may also be helpful for policy makers, practitioners, and those in educational institutions who are interested in digital storytelling and who are thinking of integrating it in a classroom environment.

Furthermore, with the current study, another aim is to provide clues for further research studies by revealing out what was aimed by the researchers, which research questions or problems were investigated according to these aims, what type of research design was followed by scholars in the light of research problems, and what type of digital storytelling implications were made in the field of instructional technology. Therefore, practitioners, researchers and instructional designers for K-12 level students will have an overall point of view about digital storytelling studies and a chance to look over what type of studies have been conducted and what type of studies are needed in the field of digital storytelling.

From the *practice* perspective, the aim is to provide practitioners and instructional designers an overall view with respect to digital storytelling studies in the field of education by synthesizing both findings of inspected research studies and findings revealed from the opinions of field experts.

From the *practice for practitioners*' perspective, it is planned to provide a conceptual framework by using some visual aids such as graphs and frequency tables. By this way, the ones who plan to integrate a digital storytelling into their curriculum can easily have an idea about which constructs, such as achievement, motivation etc., are associated with the educational use of digital storytelling and its effects on them. Therefore, practitioners, who are either instructional designers or instructors of specific course, will have a pre-knowledge about which aspects of students can be improved by involving digital storytelling in curriculum.

Lastly, from the *research* perspective, researchers who want to conduct a digital storytelling study in the field of education or in other fields can see the overall structure

that describes characteristics such as research aims, data gathering methods and instruments, data analysis methods and etc. in the light of the findings of both sections of the study. Furthermore, the most significant part of the study in terms of researchers is to provide a new direction for their digital storytelling studies in terms of research problems, theoretical base and research methodology.

1.6. Limitations of Study

This study has some limitations. One of them is the doubt of finding all relevant research studies about educational use of digital storytelling for the first part of the study since some publications are not cost-free, or they are unavailable as full-text of some research studies. Another limitation with respect to involvement of studies is that only K-12 studies were involved in this study for deep analysis. Research studies used in this study were indexed and provided in Appendix A. Therefore, this study is limited to these research studies. Yet, another limitation for the study is the amount of international participants for the second part of the study. This study involves only one international participant, so this might be accepted as a limitation.

1.7. Definitions of Terms

Storytelling: "Storytelling is the natural way through which people make sense of the events, situations and encounters they find themselves in" (Kelchtermans, 2009, p. 260)

Digital Storytelling: "the modern expression of the ancient arts of storytelling…Digital stories derive their power through weaving images, music, narrative and voice together, thereby giving deep dimension and vivid color to characters, situations, and insights." (The Digital Storytelling Association, 2002; as cited in, Chung, 2006, p. 35).

Meta-Analysis: "the statistical analysis of a large collection of analysis results from individual studies for the purpose of integrating the findings" (Gene Glass, 1976, p. 3).

Meta-Synthesis: “a research methodology to review a large body of literature and systematically synthesize the findings in an effort to develop a more informed understanding of a particular area of interest” (Tang, 2009, p. 2341).

CHAPTER 2

LITERATURE REVIEW

2.1. Overview of Storytelling

> "The truth about stories is that that's all we are." (King 2003, p2.; as cited in Hug, 2012)
>
> "Everyone has their stories to tell, and every day we hear from others about their experiences in the form of stories" (Xu, Park, & Baek, 2011, p. 181)
>
> "…all we have are experiences, but all we can effectively tell others are stories" "We know what we tell, and we tell what we know" (Schank, 1995, p.12; p.17)
>
> "Storytelling is the natural way through which people make sense of the events, situations and encounters they find themselves in" (Kelchtermans, 2009, p. 260)

Storytelling is an inherent element of humankind and can be claimed as one of the oldest practices for social life, communication and learning (Bratitsis & Ziannas, 2015; Hug, 2012). Even, communication of people is constituted by the number of stories that have been known, selected and told others at the right time (Schank, 1995). Rosen (1986) provides a different point of view through which he describes the human brain as a narrative device which runs on stories. Like Rosen, Eck (2006) associates brain activity with a storytelling as "brain is wired to organize, retain and access information through a story and that every relationship experience and object is recorded in the mind as a story" (p. 10-11). On the other hand, Lambert (2010) provides metaphorical perspective by stating that "as we are made of water, bone, and biochemistry, we are made of stories" (p.V). In a similar way, Stone (1988) defines storytelling as a basic

requirement for humankind by providing that "storytelling is not a luxury to humanity. It's almost as necessary as bread. We cannot imagine ourselves without it because each self is a story" (p. 75; as citen in Cole, Street, & Felt, 2012).

Furthermore, telling a story is also "prevalent in all aspects of human social interaction" (Xu, Park, & Baek, 2011, p. 181; Chung, 2006, p. 35). Perhaps, it is possible to say that telling something or a story is a must for socialization and communication process. Otherwise, how can people socialize and communicate with each other? Since there is not a possible way to understand what people think or want to say from their glances yet, the only way to communicate is by expressing ideas and emotions through telling stories. Fortunately, people can tell something to someone effortlessly and automatically. To improve this judgment, Bruner (2002) states that "we know how to tailor our stories quite effortlessly to further our own ends and know when others are doing the same" (p. 3). Despite the fact that telling a story does not require an effort and it is performed automatically, to do this, there should be a sequence of events to remember. According to Schank (1995), "people remember what happens to them, and they tell other people what they remember. People learn from what happens to them, and they guide their future actions accordingly." (p. 1). Humans are prone to tell stories during interacting and socializing with others (Chung, 2006), and through storytelling, people "tend to make better sense of complex ideas, concepts, or information" (p. 35). According to (Sukovic, 2014b), thanks to storytelling, learners not only comprehend complex ideas but also have a chance to compare them. Furthermore, Schank (1995) remarks the importance of storytelling with regard to comprehension by his own words as "People think in terms of stories. They understand the world in terms of stories that they have already understood. New events or problems are understood by reference to old previously understood stories and are explained to others by the use of stories. We understand personal problems and relationships between people through stories that typify those situations. We also understand just about everything else in this way as well." (p. 219)

Meanwhile, the important question to ask is why do we need to tell stories then? According to Schank (1995), it is hard to explain justification lies behind telling a story by one unified reason. He claims that no story is told for only one goal, rather storytellers may have one goal for themselves and another goal for listeners of their story. Schank (1995) groups the goals of telling a story into 3 categories as (a) *me-goals*; the intentions that storytellers have with respect to themselves, (b) *you-goals*; the intentions that storytellers have with respect to others, and (c) *conversational goals*; the intentions that storytellers have with respect to the conversation itself (p. 41). Duveskog et. al. (2012) assigns meaning to storytelling process as information transfer from one generation to another by stating that "In many cultures, people use stories to make sense of their world and to pass knowledge on to future generations" (p. 225). Chung (2006) also supports this idea by claiming that storytelling connects past generation with the present and future. For the issue of cultural transfer, it can be claimed that stories and storytelling enable people "passing down beliefs, traditions, and history to future generation" (Hamilton & Weiss, 1990, p.1). Therefore, although telling something or a story is performed effortlessly and automatically most of the time, it can actually be said that people generally tend to share their stories by depending on some goals when stories are examined structurally and contextually.

By looking at the listeners' perspective, is it possible to say that all stories attract the attention of listeners? The answer is definitely "no" since people are prone to pay close attention to the stories that seem to be identical to themselves (Schank, 1995). In other words, people are looking to say "well, *something like that happened to me too* or *I had an idea about something like that myself*" (Schank, 1995, p. 24). Then, it is possible to claim that whether the story is listened attentively or not is independent from the goal of story-tellers since the story must be considerable, identical and interesting for listeners to listen.

2.2. Types of stories

Lambert (2010) categorizes personal stories as follows; *character stories* through which storytellers give importance to relationships of themselves rather than details of their life story; *memorial stories* through which storytellers base their stories on their impressive and soul-shattering memories such as the person they most enjoy interacting with, a person who drives them crazy or a lesson learned from a specific relationship with a person and etc.; *adventure stories* through which storytellers share their experiences of personal realizations in terms of their travels or trips; *accomplishment stories* that involve expression of achievement of something like graduation from school or landing a major contract; *recovery stories* that allow storytellers to express their feelings and sharing their experiences about overcoming a great challenge such a descent, crisis or survival of something; *love stories* as is evident from its name, stories about person(s) who is (are) a big part of our lives (a lover, parent(s), baby etc.); *discovery stories* written or told for sharing of the process of learning something such as developing of a new product and fixing a broken bicycle. On the other hand, Schank (1995) categorizes stories different from Lambert (2010) as *official stories* from which people learn an official place such as school, church, a business and the government; *invented or adapted stories* produced for the purpose of entertainment in a way of sometimes leaving the original experience unrecognizable in the process; *firsthand stories* that tell one's own personal experience from firsthand; *secondhand stories* which are told about someone else's experience as it was heard; *culturally common stories* obtained from the environment without hearing them from a person or being made up by someone. Furthermore, Hug (2012) groups story types into 3 categories as *personal narratives* through which learners can share and learn cultural issues and family backgrounds, *documentaries* through which learners can be able to examine historical events by focusing on supporting documents, *stories that inform or instruct* ,or instructive stories, through which learners can handle instructional materials in subject areas.

2.3. Categories of storytelling

Becker & Freberg (2014) describes storytelling into three categories as; (1) *strategic storytelling* through which a superior (an organization leader) holds a meeting and shares organizational stories with audiences, (2) *instructional storytelling* in which the storytelling session is performed in a more structured and formalized way by aiming to advance the organization's goal through expressing how certain activities, professions and experiences are being practiced, (3) *structured storytelling* that "focuses on stories that highlight particular experiences, events and lessons learned in a natural progression of events and time in order to align them with the principles of an institution or organization" (p. 416). Besides, Gaeta and co-workers provide four categories of storytelling as: *linear vs. non-linear storytelling* based on action sequences of media occurring in the story, *Adaptive/Interactive storytelling* based on decision of storytellers involving interaction of people or not, *a collaborative/social storytelling* based on using collaborative and social features of web 2.0 technologies (annotation, collaborative writing, video-sharing, etc.) and *mobile/ubiquitous storytelling* based on a physical environment of digital story distribution among digital natives who interact with digital content and others using mobile devices and communication technologies (Gaeta et al., 2014). Whichever type storytelling is about, it is based on narrative which is a fundamental cognitive activity for deriving meaning from an experience (Herman, 2003; as cited in Tsiviltidou, 2015, p.91) and defined by Bruner (2002) as "unique sequence of events, mental states, happenings involving human beings as characters or actors: these are its constituents. However, these constituents do not, as it were, have a life or meaning of their own. Their meaning is given by their place in the overall configuration of the sequence as a whole – its plot or fabula"(as cited in; Gaeta et al., 2014, p. 622).

2.4. Benefits of Storytelling in Teaching and Learning

While considering the benefits of storytelling, some scholars claim that storytelling empowers learners' higher order thinking and literacy skills by increasing

collaborative learning (as cited in, Xu, Park, & Baek, 2011). In concert with thinking and literacy skills, storytelling enhances communication skills as well. Chung (2006) claims that "communication seems to be more effective and personal when it occurs via storytelling" (p. 35). Correspondingly, Wang and Zhan (2010) treats storytelling as the oldest form of education that "contributes uniquely to children's language and literacy development in speech and written composition, as well as language development in both reading and listening" (Trawick-Smith, 2003; as cited in Wang & Zhan, 2010, p. 77). In terms of language development, storytelling gives educators an opportunity to observe learners' development of oral language structures and vocabulary growth (Kervin & Mantei, 2016). Storytelling in language teaching also has some key benefits for learners as follows; "(a) making sense of experiences, (b) portraying roles played by various characters in stories, (c) making past events present and abstract events more vivid, and (d) forging relationships and facilitating language skills" (McCabe, 1996, as cited in; Mccarthey, 2004, p. 29) Furthermore, storytelling process is claimed to strengthen students' critical thinking and report writing skills (Castañeda, 2013) and develop the presentational mode of communication (Castaneda, 2013). On the other hand, scholars also point out that storytelling is also used in creative and academic writing courses, social and cultural history courses and even in teacher training by helping to 'build a collaborative community' and promoting plurality (Clarke & Adam, 2012, p. 161). Stories not only help children become individually interested in the past and the present concurrently, but also they become an important part of the social studies curriculum by helping children realize how social studies is the study of people and their lives (Combs & Beach, 1994). Besides, storytelling contributes to the formation of communication and collaboration skills (Blas, Garzotto, Paolini, & Sabiescu, 2009; Crăciun, Crăciun, & Bunoiu, 2016) as well as creativity and intellectual curiosity (21st century skills), the increase of interest for science and a favorable attitude towards science, scientists and scientific research (especially for secondary school students)" (Crăciun, Crăciun, & Bunoiu, 2016, p. 310001-2;). By thinking of benefits of storytelling, Chung (2006) states that "People

tend to make a better sense of complex ideas, concepts, or information when it occurs via storytelling" (as cited in; Xu, Park, & Baek, 2011, p. 181). Furthermore, storytelling provides some rich facilities to the students as; "(a) to explore, express, and reflect themselves (Skinner & Hagood, 2008); (b) to enhance critical thinking (Ohler, 2005); (c) to foster academic achievement (Yang & Wu, 2012); and (d) to build leadership skills (Guajardo et al., 2011)" (as cited in; Angay-Crowder et al., 2013, p. 38). With the property of allowing people to recall previously learned experiences, storytelling has an effect on enhancing memory (Bruner, 1996; Zull, 2002; Schank, 1990, as cited in; Hung, Hwang, & Huang, 2012) and promotes cognitive changes (Schank and Abelson, 1995, as cited in; Sarica & Usluel, 2016). According to Grisham (2006), storytelling has functions of establishing self-confidence and promoting learning motivation (as cited in; Hung, Hwang, & Huang, 2012, p.370).

2.5. Digital Storytelling

With the rapid development of technology and the increase use of computers to tell stories by using variety of hardware and software systems (Van Gils, 2005; as cited in Smeda, Dakich, & Sharda, 2014, p.3), storytelling takes a digital form and is conceptualized as digital storytelling and started to be used in education as an effective tool for enhancing teaching and learning (Xu, Park, & Baek, 2011). The origin of the digital storytelling can be traced back to the late 1980s when it's used as "a method employed by community theatre workers to enable the recording, production, and dissemination of stories" (Lambert ,2009 as cited in; Clarke & Adam, 2012, p. 159). Normann (2011) remarks the change of the way of stories being told as "People have always told stories. It has been part of our tradition and heritage since the time we gathered around the fire to share our stories. Today people still tell stories, but now we have new media tools with which to share them. A digital story can hence be seen as a merger between the old storytelling tradition and the use of new technology" (p.1). The Digital Storytelling Association (2002) defines digital storytelling as "the modern expression of the ancient arts of storytelling. Digital stories derive their power through

weaving images, music, narrative and voice together, thereby giving deep dimension and vivid color to characters, situations, and insights." (as cited in, Chung, 2006, p. 35). More techno-centric definition of digital storytelling made by Kang et al. (2003), Shin and Park (2008) as "storytelling that is conducted using digital technology as the medium or method of expression, in particular using digital media in a computer-network environment" (as cited in; Xu, Park, & Baek, 2011, p. 181). Furthermore, Bass and Linkon (2008) attempts to define digital storytelling as multimedia authoring projects with a combination of texts, images, and audio files that end up a short film clip (mostly 3–10 minutes). According to Castaneda & Castañeda (2012), digital storytelling is "the practice of combining multiple modes of technology, such as photographs, text, music, audio narration, and video clips, to produce a compelling, emotional, and in-depth story" (p. 45). Although scholars define digital storytelling from more theoretical to technical perspective, the idea is simple; to enrich stories or personal narratives (Gachago, Condy, Ivala, & Chigona, 2014) by making them "more versatile, exciting, and interesting through the use of text, voice, music, animation, video, and game elements" (Duveskog et al., 2012, p. 226). Digital storytelling which is termed as digital documentaries, computer-based narratives, digital essays, electronic memoirs, and interactive storytelling (Daniels, 2013) involves three components: "a narrative script that becomes the voice over and subtitles for the video; still photos and/or short video clips combined to create the visual component of the video; and music that sets the mood and accentuates the overall effect" (Cushing & Love, 2013, p. 68).

2.6. Characteristics of Digital Storytelling

Like other learning/teaching strategies, digital storytelling also has some characteristics given by Lundby (2008, p.1) as "(a) short, just a few minutes long; (b) made off the self-equipment and techniques with inexpensive productions; (c) small-scale stories, centered on the narrator's own personal life and told in his or her own voice (as cited in; Gregori-Signes & Pennock-Speck, 2012, para. 2). As noted by

authors, digital stories can be created by inexpensive technological tools in a way to last a very short time (usually 3 – 4 minutes long) and be centralized on its creator's experience and expression. On the other hand, according to Seo and Park (2009), characteristics of digital storytelling can be clustered into four components as flexibility, universality, interactivity and community formation. By *flexibility*, it is meant that digital stories are made of a non-linear form supported by digital technologies. *Universality* refers to easily producible property of digital stories through which everyone can become a producer of digital stories without being a media professional (Blithe, Carrera, & Medaille, 2015) and the need of learning complex story making software. *Interactivity* means that digital stories are produced with the participation of users by the support of media characteristics that can be mutually exchanged. *Community formation* refers to collecting people around the same purpose by creating a digital story network all around the world with the help of computer technologies and internet (Seo a& Park, 2009).

2.7. Categories of Digital Stories

Digital stories are categorized into three groups by (Robin, 2006) as "1) personal narratives - stories that contain accounts of significant incidents in one's life; 2) historical documentaries – stories that examine dramatic events that help us understand the past, and 3) stories designed to inform or instruct the viewer on a particular concept or practice" (p. 710) and Gregori (2011) added the new category as "socio-political digital storytelling" (as cited in; Gregori-Signes & Pennock-Speck, 2012, para. 3). Indeed, digital storytelling types might be combined into two categories: social and educational (Gregori-Signes & Pennock-Speck, 2012). While using digital storytelling in educational settings, perhaps the most important decision that should be made by authorities is by whom digital story is created; a teacher or a student? Both of them have benefits on students. If digital stories are created by the teacher and is shown to students as a new material, they may capture students' attention and enhance their interest to discover new ideas (Robin, 2006). Teacher-created digital stories may

also enrich curriculum in a way to "facilitate discussion about the topics presented a story and as a way of making abstract or conceptual content more understandable" (Robin, 2006, p.711). Furthermore, some research also shows that multimedia-enriched lessons may help students become more "proficient creators of internal visual imagery" (Hibbing Anne Nielsen & Rankin-Erickson, 2003) through which they comprehend newly presented difficult materials. By allowing students to create their own digital stories, students' communication skills can be enhanced through organization of their ideas, asking questions, expressing opinions, and constructing narratives (Robin, 2006). While students are engaging in creation of digital stories, they might be more interested, attentive and motivated since they are qualified as "digital generation" students in today's classrooms (Robin, 2006).

2.8. Digital Storytelling and Literacy Skills

Digital storytelling supports the foundation of different types of literacy (Robin, 2006) that have emerged in association with the developing technology in recent years and labeled as "Twenty-first Century Literacy" (Brown, Bryan, & Brown, 2005). These literacy types are described as follows (Brown, Bryan, & Brown, 2005, p. 3; Robin, 2006, p.712);

Digital Literacy; the ability to communicate with an ever-expanding community to discuss issues, gather information, and seek help;
Global Literacy; the capacity to read, interpret, respond, and contextualize messages from a global perspective;
Technology Literacy; the ability to use computers and other technology to improve learning, productivity, and performance;
Visual Literacy; the ability to understand, produce and communicate through visual images;
Information Literacy; the ability to find, evaluate and synthesize information.

Students creating digital stories have a chance to improve their digital literacy skills by using variety of multimedia elements (text, images, audio and video) and technological tools (scanners, digital still cameras and video cameras) (Brown et al., 2005) as well as mobile technologies like smart phones. Thanks to web 2.0 technologies, students may also improve their digital literacy skills by sharing their finished digital stories with their peers through web environments, and as a result they have the opportunity to "gain valuable experience in critiquing their own and other students' work, which can promote gains in emotional intelligence and social learning" (Robin, 2006, p.712). Since the technology use is in the heart of digital storytelling process, students can also improve their visual literacy skills by critiquing which images they should use in their digital stories. When students gain these types of literacy skills, they have an opportunity "to enhance communication skills as they learn to conduct research on a topic, ask questions, organize their ideas, express opinions, and construct meaningful narratives" (Robin, 2008, p. 224) as well. The New London Group (NLG, 1996) defines a term of *multi-literacy* which encompasses all of these literacy types as "the multiplicity of communication channels and media, and the increasing saliency of cultural and linguistic diversity" (p. 63). Furthermore, Robin(2006) summarizes full complement of literacy skills that are obtained by students while engaging in developing digital stories as (p. 712);

Research Skills: Documenting the story, finding and analyzing pertinent information;
Writing Skills: Formulating a point of view and developing a script;
Organization Skills: Managing the scope of the project, the materials used and the time it takes to complete the task;
Technology Skills: learning to use a variety of tools, such as digital cameras, scanners, microphones and multimedia authoring software;
Presentation Skills: Deciding how to best present the story to an audience;
Interview Skills: Finding sources to interview and determining questions to ask;
Interpersonal Skills: Working within a group and determining individual roles for group members;

Problem-Solving Skills: Learning to make decisions and overcome obstacles at all stages of the project, from inception to completion; and
Assessment Skills: Gaining expertise critiquing their own and others' work.

In addition to all of these, in their comparative study of international frameworks for 21st century competences, Voogt & Roblin (2012) provides four competences that are regarded as significant competences for the 21st century by most frameworks as follows; creativity, critical thinking, problem-solving and productivity, which is an ability to develop relevant and high-quality products.

2.9. Elements of Digital Storytelling Process

Digital storytelling involves seven key elements that should be taken into consideration while conducting a research about digital storytelling or applying in classroom settings as (Lambert, 2002; as cited in; Condy, Chigona, Gachago, & Ivala, 2012, p. 279);

Point of view: digital storytelling allows the storyteller to come close to his audience by expressing personal experiences through first-person point of view; in other words, "the unique perspective that the storyteller brings to the story" (Blithe et al., 2015, p. 61) or "to allow a writer to experience the power of personal expression" (Bull & Kajder, 2004, p. 48).
Dramatic question: A plot is developed in a digital story thereby distinguishing it from showing wedding pictures with music and flashy pictures. Dramatic question can also be thought as "a question answered at the end of the story" (Cabrejas Peñuelas, 2013, p. 70). Beside, a dramatic question that is re-solved by the end of the story is the characteristic of the digital story which differentiates it from a travelogue (Bull & Kajder, 2004, p. 48).
Emotional content: Effective digital storytelling evokes an emotion from the audience (Bull & Kajder, 2004, p. 48), and it also makes the storyteller's emotional connection to the story's content (Blithe et al., 2015, p. 61).

Economy: Economy can be described as "the ability to tell the story concisely and with well-chosen images for maximum impact" (Blithe et al., 2015, p. 62). According to Bull and Kajder (2004), economy is the most difficult element of digital storytelling for both novices and experienced writers to accomplish. However, they put emphasis on economy in terms of school setting by stating that "limiting the scope of the digital story has two practical benefits. It makes the construction process manageable in a school setting, and it makes it practical for an audience to view the stories of an entire class in a single session" (p. 48). Furthermore, economy feature provides an important thinking strategy of determining what is important (what content should be kept) and what is not important (what content should be deleted) in a practical way for dealers of digital storytelling (Fries-Gather, 2010).

Pacing: Determining the rhythm of a story to sustain audiences' interest. Bull and Kajder (2004) draws attention about the strong and significant interaction between economy and pacing. According to them, there is a common mistake made by novice storytellers that several pages of scripts are tried to be involved in a two-minute story by narrating it as rapidly as they can and this approach does not allow them "to pause or vary the pace" (p .48). Therefore, for digital storytellers pacing should mean "pulling back or racing forward when the story calls for it, as opposed to when the time limit approaches" (p. 48).

The gift of voice: the pitch, inflections, tenderness and timbre of storyteller's own voice is one of the most essential elements that contribute to the effectiveness of digital storytelling since there is no option to use substitute for their own voice (Bull & Kajder, 2004).

Soundtrack: Using music to enhance the story and create an emotional response. According to Bull and Kajder (2004) "properly employed music can enhance and underscore the accompanying story, adding complexity and depth to the narrative" (p. 48).

In addition to seven key elements of digital storytelling, Angay-Crowder et al. (2013) put emphasis on 10 key steps and strategies to consider for a great digital story: "(a)

find your story; (b) map your story; (c) capture your audience's attention right away and keep it; (d) tell your story from your unique point of view; (e) use fresh and vivid language; (f) integrate emotions—yours and audience's; (g) use your own voice in the script and in the audio; (h) choose your images and sounds carefully; (i) be as brief as you can be; and (j) make sure your story has a good rhythm" (p. 40).

2.10. 4-step Approach for Creation of a Digital Story

Robin (2005) describes 4-step approach for creation of an effective and good digital story. These steps are namely, (1) define, collect and decide, (2) select, import and create, (3) decide, write, record and finalize, (4) demonstrate, evaluate and replicate. In the first step, storytellers start by defining the topic or title of the digital story and continues by creating folder for saving materials, searching materials such as image, drawings, pictures etc., and considering the purpose of the story. In the second step, they select materials to be used in digital story such as audio, images, text and content and import them using digital story creation software and arrange their order. In the third step, they decide the purpose and point of view of the digital story, write textual script for the voiceover session, capture voice for narration, and import voice capture to related software for finalizing the story. Finally, in the fourth step, they share their digital stories with their peers and give and receive feedback for the stories. All of these steps have also been provided in Table 2.1 below in detail.

Table 2.1. *4-Step Approach for Creation of a Digital Story (Robin, 2005)*

Steps	**Procedures**
1. Define, collect and decide	• Select a topic for your digital story • Create a folder on the desktop where you can store the materials you find • Search for image resources for your story, including: pictures, drawings, photographs, maps, charts, etc. • Try to locate audio resources such as music, speeches, interviews, and sound effects • Try to find informational content, which might come from web sites, word processed documents, or PowerPoint slides

	• Begin thinking of the purpose of your story
2. Select, import and create	• Select the images you would like to use for your digital story • Select the audio you would like to use for your digital story • Select the content and text you would like to use for your digital story • Import images into digital story creation software • Import audio into digital story creation software • Modify number of images and/or image order, if necessary
3. Decide, write, record and finalize	• Decide on the purpose and point of view of your digital story • Write a script that will be used as narration in your digital story and provides the purpose and point of view you have chosen • Use a computer microphone and record the narration of your script • Import the narration into digital story creation software • Finalize your digital story by saving it as a Windows Media Video (WMV) file
4. Demonstrate, evaluate and replicate	• Show your digital story to your peers • Gather feedback about how the story could be improved, expanded and used in your classroom • Help other groups to create their own digital story

2.11. Benefits of Digital Storytelling in Teaching and Learning

> "Digital stories give students an opportunity to experiment with self-representation" (Raven & O'Donnell, 2010)

As a result of many studies conducted by scholars, it is revealed that digital storytelling has so many benefits on students. For instance, Alcantud-Díaz (2013) claims that digital story "locates the students in the epicenter of the learning process" (p. 2) and it eases the learning of cross curricular competences as group work, written and spoken communication, autonomous learning and project work. On the other hand, Alrutz

(2015) states that digital storytelling is a process which connects students' interest in technology by inviting them to create rather than consume.

Furthermore, digital storytelling enables students to explore, express, and reflect themselves (Skinner & Hagood, 2008), to enhance their creative thinking skills (Castañeda, 2013; Ohler, 2005) which is defined as "reasonable reflective thinking focused upon deciding what to believe or do" (Ennis, 1993), to foster academic achievement (Yang & Wu, 2012), to build leadership skills (Guajardo et al., 2011; as cited in Angay-Crowder et al., 2013, p. 38) and creativity among children though social interaction (Carbonaro et al., 2008, as cited in; Gyabak & Godina, 2011, p. 2236) , to promote self-efficacy towards technology and dispositions (Heo, 2009), to increase motivation (Sylvester & Greenidge, 2009) and moral imagination (von Weltzien Hoivik, 2004), to improve independent learning skills (Hafner & Miller, 2011), oral reading fluency (Kimura, 2012) and writing skills (Ballast, Stephens, & Radcliffe, 2008; Gakhar & Thompson, 2007 as cited in; Xu et al., 2011, p. 182).

Besides, while Hung, Hwang, and Huang (2012) treats digital storytelling as an "effective approach to promoting cooperation and knowledge construction in classrooms" (p. 368), Bjørgen (2010) treats digital story production as a contributor of "learning, learning identity and agency" only if it is based on "more fully developed pedagogical strategies carefully linking school and leisure time activities" (p. 162). Morris (2003) states that not only creating but also viewing digital stories enhances students' self-assessment skills in terms of metacognition, reflection and critical thinking (as cited in; Blithe et al., 2015, p. 63). Perhaps, the best summarizing statement about benefits of digital storytelling is provided by Hur & Suh (2012) as "When students create a digital story, their roles change from passive information receivers to active knowledge developers" (p. 324). Using digital storytelling in education is beneficial for not only students but also teachers as it enables teachers "to distinguish themselves as educators who actively acknowledge and embrace the learning styles preferences and technological realities of their digital-age students"

(Roby, 2010, p. 139). Below Figure 2.1 shows some benefits of using digital storytelling in education and its associated components;

Figure 2.1. The convergence of digital storytelling in education (Robin, 2008, p. 223)

In addition to all these benefits, digital storytelling fosters compression of complex ideas by using multiple media (Oppermann, 2008), and digital stories have proven "to be a powerful medium to express their voice with intellectual depth in a form other than writing" (p. 178).

2.12. Theoretical Bases for Educational Use of Digital Storytelling

Stories are automatically kept in mind without realizing what is being done. Bruner (2002) states that "what we know intuitively about stories is enough to get us through the familiar routines, but it serves us much less well when we try to understand or explain what we are doing or try to get it under deliberate control" (p.4). So, how do we create stories or save them in our mind? The answer of this question takes us to the term of intelligence which is differently defined by Schank (1995) as "intelligence, in the popular mind, refers to the capacity to solve complex problems, but another way of looking at the issue might be to say that intelligence is really about understanding what has happened well enough to be able to predict when it might happen again" (p.1). To understand what's going around us and explain it to someone else represents a critical component of intelligence and can be associated with having a memory of past events that are available for us to use them in the case of interpretation of new events (Schank, 1995). In other words, there is a contextual need for relating to what has been already known to what has been heard since people understand events in terms of events they have already understood (Schank, 1995). This is the logic that lies behind the theory of *Case-Based Reasoning* (CBR) that is broadly defined as remembering previous situations similar to the current one and using them to help solve the new problem (Kolodner, 1992). Case-based reasoning can also be explained as "… adapting old solutions to meet new demands; using old cases to explain new situations; using old cases to critique new solutions; or reasoning from precedents to interpret a new situation (much like lawyers do) or create an equitable solution to a new problem (much like labor mediators do)" (Kolodner, 1992, p. 4). Therefore, people tend to associate new events with prior ones while solving problems or comprehending new situations to build them on a solid ground.

Well, how do we make this association in our minds? This can be explained by the process of recalling defined as "the mind's method of coordinating past events to enable generalization and prediction" (Schank, 1995, p. 1) and is the core of intelligent behavior (p. 2). In order to remember a story or assimilate a case (Schank, 1995), it

must be recorded in a memory with some labels that are termed as index. These indices are used for accessing information when needed. Schank (1995) states that "*information without access to that information is not information at all*" (p. 11). He then adds that "memory, in order to be effective, must contain both specific experiences (memories) and labels (memory traces)" (p.11). When we provide more information about a case or event, this means we allocate more places in our memory which leads to more ways to compare them with other cases (Schank, 1995). This is valid for stories as well in which many indices attached as locations, attitudes, quandaries, decisions, conclusions and etc. by unconsciously (Schank, Berman & Macpherson, 1999). Herein, it can be estimated that the more indices that story being told possesses, the more allocation unit resided in memory whose major processes are creation, storage, and retrieval of stories (Schank, 1995).

From the learning perspective, Schank (1995) states that "the more indices, the greater the number of comparisons with prior experiences and hence the greater the learning" (p.11) and "learning from one's own experiences depends upon being able to communicate our experiences as stories to others" (p. 12). Furthermore, Jonassen (2000) describes learning from the CBR perspective as "…is a process of indexing and filling experience-based lessons and reusing those in similar situations in the future" (p. 43). Reminding and indexing are the main components of the storytelling process, so it can be claimed that storytelling is directly related to the case-based reasoning theory since it is the process of reminding people of old events by using indices to comprehend new cases.

Digital storytelling is the process of digitilizing storytelling process in order to add new features such as collaboration which facilitates individuals' ability to comprehend cases through multiple perspectives or different point of views (Alesandrini & Larson, 2002), media import (music, sound, image and video) and sharing stories with the help of technological opportunities. By thinking of its storytelling base, digital storytelling process can be linked to case-based reasoning; however, with the role of technology,

it can also be linked to some other well-known theories. For instance, *constructionism* (Papert, 1993) and *narrative paradigm* (Fisher 1985, 1989) can be considered as two fundamental theories supporting various and innovative uses of digital storytelling in education (as cited in; Wang & Zhan, 2010, p. 79).

Constructionism is a learning theory developed by Seymour Papert based upon Jean Piaget's constructivism which assumes that learners construct their mental models that are defined as "… mental representations, including metaphorical, visual-spatial, and structural knowledge, that enable learners to build runnable models of the phenomena to test their understanding" (Jonassen & Henning, 1999; as cited in Jonassen, 2000, p.138) in order to understand the world around them. Constructionism, and also constructivism, advocates individualized, student-centered and discovery learning through which learners actively explore new information and construct meaning from the new information by linking it to previous knowledge and experience (Alesandrini & Larson, 2002). Since constructionism is based upon the idea of "individuals construct knowledge" that is also fundamental for constructivism, both theories share similarities. However, this does not ensure that both theories are completely the same. The main difference between constructionism and constructivism is the focus point. While focus point of Piaget is more on mental constructions, Papert's is on constructions as they are manifested in object 'in the world' and Papert calls these constructions as "public entities" (Kretchmar, 2015, p. 2). Another issue that discriminates the constructionism from the constructivism is the emphasis on learning approach which is valuing concrete over the abstract rather than solely abstract (Kretchmar, 2015). Furthermore, constructionism remarked by its property of self-guidance that the student is guided by his/her own work as it proceeds rather than being guided by a pre-set plan, or formal rules of logic (Papert, 1991 as cited in; Kretchmar, 2015, p. 2). Constructionism is defined by its founder Seymour Papert's own words as "Constructionism—the N word as opposed to the V word— shares constructivism's view of learning as "building knowledge structures" through progressive internalization of actions. It then adds the idea that this happens especially felicitously

in a context where the learner is consciously engaged in constructing a public entity, whether it's a sand castle on the beach or a theory of the universe" (Papert, 1991, p. 1 as cited in; Ackermann, 2001, p.4). Kafai and Resnick (1996) explain "constructionism suggests that learners are particularly likely to make new ideas when they are actively engaged in making some type of artifact – be it a robot, a poem, a sand castle, or a computer program – which they can reflect upon and share with others" (p.1). Seymour Papert also defines constructionism in a proposal to National Science Foundation[1] as "The word constructionism is a mnemonic for two aspects of the theory of science education underlying this project. From constructivist theories of psychology, we take a view of learning as a reconstruction rather than as a transmission of knowledge. Then, we extend the idea of manipulative materials to the idea that learning is most effective when part of an activity the learner experiences as constructing a meaningful product" (Papert, 1989, n.p.). His comprehensive book that evaluates the school environment in the computer age, Papert (1993) associates traditional education with famous idiom about "fishing" and claims that traditional education tends to feed individuals with fish rather than teaching how to fish. According to him, constructionism does opposite by stating that "constructionism is built on the assumption that children will do best by finding "fishing" for themselves, the specific knowledge they need; organized or informal education can help most by making sure they are supported morally, psychologically, materially, and intellectually in their efforts. The kind of knowledge children most need is the knowledge that will help them get more knowledge." (p. 139). According to Ackermann (2001), Papert's approach gives a clue about "how ideas get formed and transformed when expressed through different media, when actualized in particular contexts, when worked out by individual minds" (p. 4). In other words, "the emphasis shifts from universals to individual learners' conversation with their own favorite representations, artifacts, or objects-to-think with" (Ackermann, 2001, p. 4). In a digital storytelling process,

[1] Proposal submitted to Natonal Sicence Foundation entitled as *Constructionism: A New Opportunity for Elementary Science Education*

students who create digital stories engage in different media while expressing their ideas or telling their stories; therefore, digital storytelling encapsulates Papert's approach and theory of learning called constructionism. Ackermann (2001) also states that revealing of inner feelings and ideas is a key to learning and he adds that "Expressing ideas makes them tangible and shareable which, in turn, informs, i.e., shapes and sharpens these ideas, and helps us communicate with others through our expressions" (p. 4). This is the key for digital storytelling also as learners express their feelings, ideas to their mates and peers by sharing and communicating.

Narrative paradigm, is also categorized as a communication theory, developed by Walter Fisher from the oldest form of communication – storytelling[2]. According to Fisher, meaningful communication is based upon the form of storytelling and the need for communication is shaped by our past experiences which constitute the base of our behaviors. Therefore, it can be argued that narrative paradigm is helpful for analyzing the nature of human communication[3]. Fisher (1987) states that "idea of human beings as storytellers posits the generic form of all symbol composition" (p. 63). He also adds that "symbols are created and communicated ultimately as stories meant to give order to human experience and to induce others to dwell in them in order to be created and communicated ultimately as stories meant to give order to establish ways of living in common, in intellectual and spiritual communities in which there is confirmation for the story that constitutes one's life" (Fisher, 1987, p.63). Fisher (1987) propose some presuppositions that form the base of narrative paradigm as (1) humans are essentially storytellers, (2) the paradigmatic mode of human decision making and communication is "good reasons," which vary in form among situations, genres, and media of communication, (3) the production and practice of good reasons are ruled by matters of history, biography, culture, and character along with the kinds of forces identified in the Frentz and Farrell language-action paradigm, (4) Rationality is determined by the nature of persons as narrative beings—their inherent awareness of *narrative*

[2,3] Communication theory website (http://communicationtheory.org/the-narrative-paradigm/)

probability, what constitutes a coherent story, and their constant habit of testing *narrative fidelity*, whether or not the stories they experience ring true with the stories they know to be true in their lives, (5) The world as we know it is a set of stories that must be chosen among in order for us to live a life in a process of continual re-creation (p. 64-65).

2.13. Digital Storytelling Studies around the World in Teaching and Learning

Digital storytelling is widely used as a teaching and learning method around the world. This leads to the investigation of its different aspects in research studies. Below are some research studies cited and briefly explained to provide short review about the educational use of digital storytelling and its key findings.

Castañeda (2012) conducted a case study to examine high school students' experience regarding the infusion of digital storytelling in Spanish class. Castaneda's study in which participants are fourth-year high school Spanish class students aims to determine if digital storytelling can be an effective tool for language learners to communicate emotion and present information to an audience. Throughout the study Castañeda (2012) uses pre and post open-ended questionnaires, pre and post focus groups, semi-structured subsequent interviews, observation and reflection journals for data gathering instruments and findings of the study revealed not only that students can create digital stories, but also that they can exceed the expectations of the teacher and the researcher. The study also showed that all the students participated in the study successfully completed a digital story in the target language and presented the finished product to an audience during the premiere.

Xu et al. (2011) conducted a study in order to examine the effects of digital storytelling on writing self-efficacy and on flow in the virtual reality learning environment known as Second Life. They divided participants who are sixty-four undergraduate university students into two groups; online and off-line groups. The online group created their digital stories in Second Life and the off-line group created their digital stories off-line

mode by using the video editing software like windows movie maker. These two groups are compared by employing an independent sample t-test in terms of writing self-efficacy and flow. The results of Xu et al.'s (2011) study revealed that digital storytelling in a virtual learning environment is more effective than digital storytelling offline. Furthermore, Xu et al. (2011) suggests that the digital storytelling technique can be used effectively to teach and improve writing in classroom settings.

Pardo (2014) conducted a case-study that aims to foster students' writing and speaking skills by enabling them to engage in a project in which traditional and digital storytelling are combined with the primary goal of reinforcing foreign language acquisition and development for students of English as a Foreign Language (EFL). Participants of Pardo's (2014) study involves third year undergraduate students of EFL and they were divided into groups of two or three people to create their own digital stories. In pursuit of their completion of digital stories, each student was given a questionnaire to fill out individually in order to determine whether they had found the task rewarding and productive. The result of study revealed that the creation of digital stories is useful for improving not only their linguistic abilities but also the artistic, technical and creativity skills as they had the chance of expressing themselves through writing.

Spicer & Miller (2014) examines whether digital storytelling projects are beneficial in the development of student media production skill sets. Participants of the students were first year college students in a postsecondary education class and they were asked to create a digital story about the topic of water sustainability. Spicer & Miller (2014) employed the pre and post self-efficacy survey questionnaire and results showed that significant gains in student self-efficacy beliefs on media productions tasks. In accordance with the results of the study, Spicer & Miller (2014) suggest that digital storytelling projects can be beneficial in the development of student media production skill sets.

Christiansen (2011) conducted a phenomenographic study that sought to identify the different ways in which patient digital stories influence students' professional learning. Participants of the study were the third year undergraduate nursing students who were provided patient digital stories as part of service improvement learning. A phenomenographic interview was conducted with all students participated into study as data gathering technique and phenomenographic analysis results revealed four qualitative different student experiences of patient digital stories or categories of description as (1) digital stories as a learning resource, (2) digital stories as an emotional experience, (3) digital stories as a reflective experience, (4) digital stories as transformative experience. Christiansen (2011) suggests that an identification of the critical aspects of variation of learning among students can be generated into the teaching and learning principles likely to promote transformation learning and enhanced patient centered practice.

Sarica & Usluel (2016) conducted an experimental study to determine the effect of digital storytelling on the visual memory capacity and writing skills of students. Participants of their study were primary school students and divided into two groups; experimental and control group. While students in the experimental group creates their own digital stories, students in control group were asked to prepare a poster. Sarica & Usluel (2016) employed Benton visual retention test and composition (written narrative) evaluation scale as pre-test and post-test. The result of their study revealed that students' visual memory capacity and writing skills showed a significant improvement for both experimental and control group; however, the average gain scores were higher in the experimental group. Furthermore, findings of the study showed that digital storytelling created a significant difference in the writing skills of students although no statistically significant difference was observed among two groups. Sarica & Usluel (2016) suggest that digital storytelling is effective on the development of cognitive structures in terms of visual memory and ability to express oneself.

Duman & Göcen (2015) conducted an experimental study to examine the effect of the digital storytelling method on students' creative writing skills. Participants who are second year students of primary school teaching education department were divided into experimental and control group. While experimental group students were subjected to digital storytelling-based instruction, control group students were exposed to power point-assisted instruction within the scope of instructional technologies and materials design course content. Duman & Göcen (2015) employed pre- and post-creative writing skills rubric as data gathering tool. Intra-group analysis results of the study revealed that while there is a significant difference between the experimental group students' pre-test and post-test scores in terms of creative writing skills, a significant difference has not been found between control group students' pre-test and post-test scores in terms of creative writing skills. Furthermore, inter-group analysis results of the study revealed a significant difference between the experimental group students' post-test creative writing skill score and the control group students' post-test creative writing score. Duman & Göcen (2015) interpreted the results of the study as digital storytelling has a positive effect on creative writing skills and can be used in pre-service teaching.

2.14. Summary of the Literature Review about Digital Storytelling

Briefly, storytelling can be defined shortly as one of the oldest practices for social life, communication and learning (Bratitsis & Ziannas, 2015; Hug, 2012). According to Schank (1995), people think through stories, understand the world in terms of stories and comprehend new cases and events by referencing to old previously comprehended stories. Therefore, stories have an important role in our lives. Stories were told for different kinds of purposes namely, having intention with respect to ourselves (me-goals), having an intention with respect to others (you-goals) and having an intention with respect to conversation itself (conversational goals) (Schank, 1995, p.41). Besides, stories were also used for making sense of the world and passing knowledge on to future generations (Duveskog et. al., 2012, p.225). Scholars approach types of

stories differently in the literature. For instance, while Lambert (2010) defines types of personal stories as *character stories, memorial stories, recovery stories, love stories* and *discovery stories*, Schank (1995) defines them as *official stories, invented or adapted stories, firshand stories, secondhand stories* and *common stories*. In the literature, scholars not only categorize stories, but also they categorize storytelling events as well. For instance, Becker & Freberg (2014) categorize storytelling as *strategic storytelling, instructional storytelling* and *structured storytelling*. Furthermore, storytelling has wide range of benefits in education such as improving higher-order thinking, literacy skills, collaborative learning (Xu, Park, & Baek, 2011), language use (Wang & Zhan, 2010), critical thinking skills (Castaneda, 2013), collaboration skills (Blas, Garzotto, Paolini, & Sabiescu, 2009), creativity (Craciun, Craciun, & Bunoiu, 2016), academic achievement (Yang & Wu, 2012), leadership skills (Angay & Crowder et al., 2013), enhancing memory (Bruner, 1996; Zull, 2002), promoting cognitive changes (Sarica & Usluel, 2016), self-confidence and promoting learning motivation (Hung, Hwang, & Huang, 2012).

Digital storytelling is defined briefly as the modern expression of the ancient arts of storytelling (The Digital storytelling Association, 2002) through the practice of combining multiple modes of technology such as photographs, text, music, audio narration and video clips (Castaneda & Castaneda, 2012). According to Lundby (2008, p.1) digital stories have some characteristics as being short (just a few minutes long), being made off the self-equipment and techniques with inexpensive productions, and being small-scale stories, centered on the narrator's own personal life and told in his or her own voice (as cited in; Gregori-Signes & Pennock-Speck, 2012, para. 2). Like storytelling, digital storytelling is also categorized by scholars as *personal narratives*, *historical documentaries*, and *instructive/informative stories* (Robin, 2006). Besides, digital storytelling can be grouped into two categories as *social* and *educational* (Gregori-Signes & Pennock-Speck, 2012). Digital storytelling is associated with different literacy skills as *digital literacy, global literacy, technology literacy, visual literacy* and *information literacy* (Brown, Bryan, & Brown, 2005). In addition to these,

Robin (2006) proposes skills that are enacted while creating digital stories as *research skills, writing skills, organization skills, technology skills, presentation skills, interview skills, interpersonal skills, problem-solving skills,* and *assessment skills*. Furthermore, digital stories should involve 7 core elements defined by Center for Digital Storytelling (CDS) as *point of view, dramatic question, emotional content, economy, pacing, the gift of voice* and *soundtrack*. In addition to these elements, Robin (2005) proposes a 4-step approach for a creation of digital story as (1) *define, collect and decide*, (2) *select, import and create*, (3) *decide, write, record and finalize*, (4) *demonstrate, evaluate and replicate*. Like storytelling, digital storytelling has also a wide range of benefits in terms of educational use. For instance, it provides students to improve their self-exploration, self-expression and self-reflection skills (Skinner & Hagood, 2008), creative thinking skills (Castaneda, 2013; Ohler, 2005), leadership skills (Angay-Crowder et al., 2013), independent learning skills (Hafner & Miller, 2011), self-assessment skills (Blithe et al., 2015), self-efficacy toward technology (Heo, 2009) and academic achievement (Yang & Wu, 2012).

Digital storytelling literature presents a wide range of research studies through which different aspects or effects of digital storytelling are examined around the world. Scholars inspect effects of digital storytelling on different type of literacy skills (visual literacy and technology literacy etc.), on language use skills (writing and reading etc.), and on self-efficacy skills by conducting studies in different settings (language courses, school environment, virtual learning environment etc.). Despite these wide range of research studies which investigate effects of digital storytelling on different things, there is no comprehensive research study (meta-analysis or meta-synthesis) that examines all digital storytelling studies in education literature. In addition to the comprehensive look for digital storytelling studies, there exists a need for investigating expert views about future directions of research studies regarding the educational use of digital storytelling. Therefore, it is necessary to conduct a research study which comprehensively investigates digital storytelling studies in the education field and obtains expert views about future directions of digital storytelling research studies.

This type of research study is crucial for not only researchers who are thinking of conducting a digital storytelling study but it may also be beneficial for instructional designers, practitioners and policy makers in school environments.

2.15. Meta-Analysis

Meta-analysis, which is referred by Glass (1976) as "an analysis of analyses", (p. 3) is a method that forms a bridge between the past and the current time and used for "summarizing the results of empirical studies within the behavioral, social, and health sciences" (Wilson and Lipsey, 2001, p. 2) by collecting and analyzing studies that fit into the criteria set by a researcher at the beginning. Meta-analysis, which is used interchangeably as *research synthesis* "focuses on empirical studies and seeks to summarize past research by drawing overall conclusions from many separate investigations that address related or identical hypotheses" (Cooper, 2010, p.4) with the goal of presenting "the state of knowledge concerning the relation(s) of interest and to highlight important issues that research has left unresolved" (Cooper, 2010, p.4). Although meta-analysis is accepted as one of the well-known and significant ways of summarizing, interpreting and integrating selected set of studies of scholars, it has some restrictions as follows; (a) meta-analysis is applied to empirical research studies rather than theoretical papers, conventional research reviews, policy proposals and etc., (b) it is applied only to research studies that reveals quantitative findings by using quantitative measurements of variables and reporting descriptive or inferential statistics for the summarization of data, (c) meta-analysis is a technique for encoding and analyzing the statistics that summarize research findings (Wilson and Lipsey, 2001). Despite its definite limitations, meta-analysis is important and is needed as a statistical analysis method for scientific endeavor since it aims to deal with "a large collection of analysis results from individual studies for the purpose of integrating the findings" (Glass, 1976). A common issue inspected by the meta-analysts or related scholars is the reason that lies behind the need for meta-analysis for scientific research. Glass (1976) points out this issue by stating that the literature on various topics in

education increases at an astonishing growing rate. Despite this huge amount of growing research studies in education, “the findings are fragile; they vary in confusing irregularity across contexts, classes of subjects, and countless other factors” (p. 3). Furthermore, research conducted for measuring of learning or concept formation may “progress along a systematic course” (Glass, 1976, p.4); or may be designed from “the findings of previous studies” (p. 4) and researchers have “a sense of what is known and what must be asked next” (p. 4).

In literature, it is possible to encounter different terms that are used interchangeably to represent comprehensive synthesis of literature. Cooper et al. (2009) exemplifies these terms as research synthesis, research review, and systematic review that are often used interchangeably in the social science literature and claims that “there is no consensus about whether these differences are really meaningful” (p. 6). On the other hand, research synthesis is a more preferred term among them since the word “synthesis” represents the process better than the word “review” does. In addition, the term research review is used to describe the activities of evaluating the quality of research such as whether to publish manuscript on journal or not (Cooper et al., 2009). Furthermore, systematic review may produce confusion since it brings literature review to mind, and it differs from meta-analysis as it combines the results of individual studies by quantitatively or narratively summarizing rather than using statistical method (Pang, Francis; Drummond, Michael; Song, 1999). Therefore, it is better to use research synthesis to define the process of comprehensive literature review for coming to a conclusion. The primary focus and goal of research synthesis is “to attempt to integrate empirical research for the purpose of creating generalizations” (Cooper et al., 2009, p. 6). Konstantopoulos (2013) defines research synthesis as “very clearly defined steps or activities that are followed in the process of combining quantitative evidence from a sample of related studies.” (p. 232) and provides the ultimate goal of research synthesis as “to make a general statement about relationships or effects in a research area of interest” (p. 233). Meta-analysis can be used for the synonym of research synthesis (Cooper et al., 2009) and first defined by

Gene Glass (1976, p. 3) as “the statistical analysis of a large collection of analysis results from individual studies for the purpose of integrating the findings”. Wilson and Lipsey (2001) also defines meta-analysis as combining the results of independent studies that were conducted for a custom topic and as making statistical analysis of obtained research findings to re-interpret them. Durlak (2003) describes meta-analysis as a method that combines effect sizes obtained from individual studies to analyze them for reaching an overall conclusion. Cooper et al. (2009) points out that scientific literatures are “cluttered with repeated studies of the same phenomena” (p. 4), and according to him, a possible reason for this situation is an unawareness of what others are doing. He accounts for this by stating “multiple studies on the same problem or hypothesis arise because investigators are unaware of what others are doing because they are skeptical about the results of past investigations, or because they wish to extend (that is, generalize or search for influences on) previous findings” (p. 4). Consequently, meta-analysis or more generally research synthesis is important for scientific endeavors and scholars to be informed about what others have done or are doing for building a bridge between the past and the present. In Cooper et al.'s (2009) comprehensive book of research synthesis and meta-analysis, Thomas Taveggia (1971) presents a complementary theme about heterogeneousness of research studies and point out the importance of research synthesis as;

> “A methodological principle overlooked by [synthesists] . . . is that research results are probabilistic. What this principle suggests is that, in and of themselves, the findings of any single research are meaningless—they may have occurred simply by chance. It also follows that, if a large enough number of researches has been done on a particular topic, chance alone dictates that studies will exist that report inconsistent and contradictory findings! Thus, what appears to be contradictory may simply be the positive and negative details of a distribution of findings”. (p. 7)

It is important to make a distinction between primary analysis and secondary analysis while conducting any research synthesis study. Glass (1976) point outs this distinction by providing definitions for them. The primary analysis can be defined as "the original analysis of data in a research study", and secondary analysis can be described as "the re-analysis of data for the purpose of answering the original research question with better statistical techniques, or answering new questions with old data" (Glass, 1976, p. 3). He also associates meta-analysis with secondary analysis by providing a claim of "analysis of analyses" that implies further practice of analyzing of secondary analysis. Unlike depending on any single study's result, meta-analysis trusts a combination of effect sizes obtained from a set of individual studies. This makes meta-analysis special and discriminates it from general literature review process. Meta-analysis also resolves problems and limitations which are faced during classical literature review. Wolf (1986) reveals these problems as: "(1) selective inclusion of studies, often based on the reviewer's own impressionistic view of the quality of the study, (2) differential subjective weighing of studies in the interpretation of a single set of findings, (3) misleading interpretations of study findings, (4) failure to examine characteristics of the studies as potential explanations for disparate or consistent results across studies, and (5) failure to examine moderating variables in the relationship under examination" (p. 10). Another advantage of meta-analysis is that "a meta-analysis seeks a full, meaningful statistical description of the findings of the collection of studies, and this goal typically entails not only a description of the findings in general but also a description of how the findings vary from one type of study to the next" (Glass et al., 1981, p.78-9).

2.16. Qualitative Meta-Analysis / Meta-Synthesis

Meta-synthesis is considered a qualitative version of meta-analysis and is defined as "a research methodology to review a large body of literature and systematically synthesize the findings in an effort to develop a more informed understanding of a particular area of interest" (Tang, 2009, p. 2341). Qualitative meta-analysis is defined

by its pioneers who proposed this term as "… is the aggregating of a group of studies for the purpose of discovering the essential elements and translating the results into an end product that transforms the original results into a new conceptualization" (Schreiber, Crooks, and Stern, 1997, p.314). More simple definition provided by Timulak (2009) as "qualitative meta-analysis is an attempt to conduct a rigorous secondary qualitative analysis of primary qualitative findings" and the basic idea lies behind it is "… to provide a concise and comprehensive picture of findings across qualitative studies that investigate the same general research topic" (Timulak, 2009, p.591).

An advantage of a meta-synthesis or a qualitative meta-analysis "…lies in its empirical approach, which can bring further rigor to reviewing qualitative studies" (Timulak, 2009, p.591). Furthermore, qualitative meta-analysis is characterized by Finfgeld (2003) as "a new and integrative interpretation of findings that is more substantive than those resulting from individual investigations" (p. 894). The logic and an objective lie behind the qualitative meta-analysis is the same with the quantitative meta-analysis, namely to evaluate a field of study beyond one particular study (Timulak, 2009). On the other hand, there is a difference in its data repository in which only qualitative or at least partially qualitative studies exist. Unlike meta-analysis which aims to increase certainty in cause and effect conclusions, it seeks to understand and explain phenomena (Walsh & Downe, 2005). Another exceptive feature of qualitative meta-analysis is that it attempts to "conduct a rigorous secondary qualitative analysis of primary qualitative findings" while quantitative meta-analysis aims to "bring more precise estimates of 'real' parameters of quantitative outcomes reported in primary studies" (Timulak, 2009, p. 591). Meta-synthesis is more interpretive rather than deductive (Tang, 2009) and aggregative (Finfgeld, 2003; Timulak, 2009). Consequently, this is the possible reason for preference of using the term "synthesis" instead of mere "analysis" (Timulak, 2009). Goal of qualitative meta-analysis is twofold; "(1) to provide a more comprehensive description of a phenomenon researched by a group of studies, including its ambiguities and

differences found in primary studies, and (2) to provide an assessment of the influence of the method of investigation on findings" (Timulak, 2009, p. 592). Meta-synthesis can be preferred as an alternative way of a quantitative meta-analysis by research synthesists when sufficient quantitative studies are not obtained.

CHAPTER 3

METHODOLOGY

This chapter provides an overview of research methodology by presenting information about the study design, data sources, instruments, data collection and analysis methods.

3.1. Research Questions

Throughout the study, it is aimed to find an answer to the below research questions;
RQ1. What are the characteristics of research studies about digital storytelling in K-12 education level?
RQ2. What are the researchers' opinions about the kinds of research studies needed in digital storytelling?

3.2. Design of the Study

According to research questions stated above, a current study administered by using two phase narrative qualitative study design; the first phase involves the meta-synthesis of digital storytelling studies and second phase involves the opinions of researchers in the field of digital storytelling. While meta-analytic study design was employed in the first part, narrative research study design was administered in the second part. Meta-synthesis part involves its own key steps that are provided below by defining them. For the second part of the study, interview method was used as a qualitative data collection, and thematic analysis method was employed for data analysis; both are described below.

3.2.1. Part I: Meta-Analysis of Digital Storytelling

Meta-analysis or meta-synthesis as qualitative version is employed to reach a comprehensive look at research studies about the predetermined topic for the aim of forming a bridge between past and current time by inspecting the beyond of a one particular study. Therefore, the aim for employing meta-analysis/synthesis is to aggregate a group of studies so as to transform or integrate the original results from inspected research studies into new conceptualization in a form of end product (Schreiber, Crooks, and Stern, 1997; Glass, 1976). According to Timulak (2009), researchers employing qualitative meta-analysis attempt to handle meticulous secondary qualitative analysis of primary qualitative findings with the aim of providing a concise and comprehensive picture of findings across aggregated research studies. More precisely, the goal for qualitative meta-analysis is three-fold; "(1) to provide a more comprehensive description of a phenomenon researched by a group of studies, including its ambiguities and differences found in primary studies, (2) to provide an assessment of the influence of the method of investigation on findings" (Timulak, 2009, p. 592; Konstantopoulos, 2013) and (3) to discover what is known and what must be asked next (Glass, 1976). For the first part of the current study, qualitative meta-analysis or meta-synthesis was decided to be conducted since sufficient amount of quantitative research studies were not obtained. The aim for employing meta-synthesis as mentioned above is to qualitatively analyze findings of primary research studies about educational use of digital storytelling in order to provide comprehensive picture about what have been inspected and found. In accordance with this purpose, design path known as meta-analytic process (Cooper et al., 2009) was employed as following order; (1) problem formulation, (2) literature research, (3) data evaluation, (4) data analysis, (5) interpretation of results, and (6) presenting findings. Each phase of this process was explained below in related sub-headings.

3.2.1.1. Problem formulation

Problem formulation is the first step of meta-analytic studies and is important for defining how much research will be collected for analysis. Problem formulation is also necessary for starting point of meta-analysis as it guides the selection of the research studies (Halvorsen, 1994) the coding of information from those studies, and the analysis of resulting data (Lipsey and Wilson 2001, p.12). In order to conduct a meta-analysis, primary research on a topic must exist and this is the one major factor that constraints formulation of a problem (Cooper et al., 2009). The number of research that constitutes data repository for meta-analytic study depends on the characteristics of the research problem as Cooper et al. (2009) states "A more general answer to the 'how much research' question is that it varies depending on a number of characteristics of the problem" (p. 11). This implies that broadly defined topics accumulates more varied and larger number of studies than narrowly defined topics. For the current study, problem statement is the need for cumulative or comprehensive study that broadly examines digital storytelling studies in education literature. After reviewing relevant literature for both general and K-12 education, it is seen that there is no study that handles this issue; therefore the problem formulation for this study can be defined as the literature gap related to cumulative study of digital storytelling studies in K-12 level of education. Sufficient number of primary studies that investigate educational use of digital storytelling in K-12 level are expected to be collected.

3.2.1.2. Literature research

Literature research is the step of meta-analysis that is termed as data collection process and is different from a literature review of primary researches as it collects all relevant studies for the topic of interest. However, Cooper et al. (2009) states that "culling through the literature for relevant studies is not unlike gathering a sample of primary data" (p. 12). Another difference of literature review for meta-analytic study from primary studies is that it collects not only published researches but also unpublished ones such as doctoral dissertations or master theses (Lipsey and Wilson, 2001). Even

though meta-analyst can rely on only one computerized data base with the assumption of its relevancy for the field of engagement (e.g. ERIC for education field) and covering everything that any more peripheral database would cover, it is more reliable to make comprehensive search over more than one database (Lipsey and Wilson, 2001). To be on the safe side, for this study, literature research was planned to be employed systematically through multiple databases such as Proquest, Education Resource Information Center (ERIC), EBSCO Academic Search Premier, Web of Science, Social Science Index, METU Library and database of Higher Education Council (for thesis/dissertations). Selecting appropriate keywords for search procedure is important to reach high amount of initial research studies. Lipsey and Wilson (2001) state that "to effectively locate high proportion of candidate studies for a meta-analysis, the search must be based on set of keywords that broadly cover the relevant domain" (p.26). Therefore, more general keywords or terms were selected to reach high proportion of research studies among above mentioned databases. Within this scope, "Digital Story", "Digital Storytelling", "Dijital Hikaye", "Dijital Hikaye Anlatımı", "Dijital Hikayeleme", "Dijital Öykü", "Dijital Öyküleme" were used as search keywords. Selection of primary studies to be analyzed is governed by inclusion and exclusion criteria that are initially specified at the beginning (Wong, 2007) and decision for inclusion/exclusion is made by reading their abstracts (Ahn & Kang, 2018). During data collection process, all digital storytelling studies obtained by using these relevant search keywords through databases were quickly examined through their abstract and decision about their inclusion in analysis part were given according to a set of criteria provided below;

- Must be publicly available or archived (accessibility)
- Conducted between the years of 2000 and 2018
- Published in peer-reviewed journals
- Published in English or Turkish
- Must address the issue of educational use of digital storytelling (relevancy)
- Involves some kind of instructional intervention (presence of intervention)

- Conducted in grade level of K-12
- Research questions and method clearly defined

For finding relevant research studies, related databases were searched over three time periods (see Table 3.1 below). First search was completed on January 2017 with the aim of finding research studies conducted between 2000 and 2016. As a result of this first search, 634 publications were found initially and later on they were classified for further analysis. Among these 634 publications, 36 publications were abstract papers, 25 publications were about Digital Storytelling creating environments (solely focused on the software rather than how to create a digital story), 272 publications were not about educational implementation of digital storytelling, 8 publications did not correspond a research study (project report or essay), 9 of them were a review paper, 1 of them was focused on developing a scale and 283 publications were educational. Therefore, only these 283 educational research studies were examined further for finding relevant research studies by quickly reading their introduction part. Among these 283 educational studies, 143 publications were focused on higher education or adult education, 5 publications were not a research article, 20 of them were purely explanatory articles (articles that explain theoretically why/how digital storytelling should be used and etc.), 1 of them was again evaluation of digital storytelling creation software, 4 of them were project report or essay and 110 publications were focused on K-12 with respect to digital storytelling. At the end, these 110 studies were decided to be examined deeply by reading their full text.

Second search was completed on May 2017 in order to find studies conducted between January 2017 and May 2017. As a result of this search 138 publications were found. After initial examination of these found studies, 24 of them were educational. Remaining 114 article were eliminated for different reasons such as non-relevancy, abstract papers, essays, report papers and explanatory articles. Among 24 educational publications, 8 publications focused on higher education or adult education, 5 of them were not actually digital storytelling studies (research studies involving digital

storytelling term on article's key terms but not purely focused on educational use of digital storytelling or mis-conceptualization of digital storytelling) and 11 of them focused on K-12 during implementation of digital storytelling. Therefore these 11 K-12 studies were decided to be examined deeply by reading their full text.

Third research was completed on June 2018 for finding research studies conducted between May 2017 and June 2018. As a result of this search and initial elimination, 64 documents were found to be educational. Among these educational research studies, 29 were focused higher education or adult education, 1 of them was instrumental study (developing a scale), 4 of them were not actually digital storytelling study, 7 of them project report or essay, 4 of them were review paper and 19 publications were K-12 studies (6 of them conducted on 2017 and 13 of them conducted on 2018). Therefore, 19 studies were decided to be examined deeply by reading their full text.

In addition to research articles, this study also aimed to involve dissertations for extracting remarkable information. For this purpose, database of Higher Education Council were searched by using terms "Dijital Hikaye Anlatımı", "Dijital Hikaye", "Dijital Hikayeleme", "Dijital Öykü" and "Dijital Öyküleme". For the selection of relevant digital storytelling dissertations, only criterion was being conducted for K-12 grade level. As a result of this search, 18 dissertations were found and 11 of them were reachable. Later on, these 11 reachable dissertations were examined and 5 of them decided to be examined deeply by reading their full text. Remaining 6 were eliminated for the reason of target group (higher education). As a result, 140 articles and 5 dissertations were initially decided to be examined for further analysis by reading their full text (see Table 3.1 below).

Table 3.1. *Searching Process of Relevant Publications*

Date of Search	**Type of Search**	**Time Interval of Publication**	**Initially Found**	**Elimi nated**	**Educational**	**K-12 Level**
January 2017	Article	Jan. 2000 – Dec. 2016	634	351	283	110
May 2017	Article	Jan. 2017 – May 2017	138	114	24	11
June 2018	Article	May 2017 - June 2018	186	122	64	19
Total						**140**
June 2018	Dissert ation	Jan. 2000 – June 2018	18	7	11	**5**

3.2.1.3. Data evaluation

Data evaluation is the step of judging quality of collected studies and extracting relevant information from each eligible study (Lipsey and Wilson, 2001; Wong, 2007) for the research problem. This process depends on the researchers' or synthesists' expertise and Cooper et al. (2009) claims that synthesists "must extract from each document those pieces of information that will help answer the questions that impel research in the field" (p. 12). For this study, quality of collected studies judged whether they provide relevant information or not. The current study aims to provide overall look of digital storytelling studies in K-12 education level. Therefore, collected studies for the analysis are expected to provide some remarkable information as whether digital storytelling used for educational purpose or not, whether they involve instructional intervention or not (development of digital stories or being exposed to any kind of previously created digital stories), whether research questions are clearly defined or not, methodological information, instruments for the evaluating digital storytelling process. Furthermore, for the first evaluation of collected studies to decide whether to include in further analysis, some other parameters are important. On one hand, findings of each studies should be clearly stated since it possesses utmost

importance for research studies that provides a comprehensive framework (or shortly research synthesis). On the other hand by thinking of the aim of current research study, further/future research study suggestions of each study should be clearly defined in order to describe what should be inspected in the field of digital storytelling. For this study these decisions were made through reading full texts of initially found publications. At the end of the three search periods, 140 research articles and 5 dissertations were read carefully in order to determine how many of them should be analyzed further by using qualitative data analysis software. After reading all of these publications' full text, 55 research articles and 5 dissertations were decided to be further analyzed by using data analysis software. Among these 55 articles, 53 were international (11 of them written by national authors) and 2 were national. Among 5 dissertations, 4 were national (written in Turkish) and 1 was international (written in English). As a result, totally 60 publications were further analyzed by using thematic coding (see Appendix A for complete list of analyzed publications).

3.2.1.4. Data analysis

Data analysis is the step of combining study results and employing some statistical estimations. According to Cooper et al. (2009), searching for influences on study results is the most exciting and rewarding part of the meta-analytic process to most research synthesists. Data analysis procedure is shaped by the type of meta-analytic study. If data sample is purely consisted of quantitative (experimental or quasi-experimental) studies, then statistical estimation employed to synthesize findings. However, if data sample is consisted of qualitative studies, then data analysis is done through codifying relevant information to a spreadsheet or coding by using qualitative data analysis software. For the current study, since research studies decided to be involved for further analysis are comprised of mostly qualitative studies, data were analyzed firstly through recording study entities to spreadsheet (Microsoft excel) by coding each attribute (property that publication possess) to different columns. These attributes were provided below;

- Journal Name
- Year
- Volume
- Issue Number
- Type (research article, dissertation)
- Page
- Author(s)
- Number of Author(s)
- Article Name
- Sample Size (portion of female, male participants)
- Sampling Method
- Participants (grade level)
- Research Questions
- Theoretical Framework (theory used or indicated)
- Research Type (Qualitative/Quantitative/Mixed)
- Research Methodology
- Instrument(s)
- Data Analysis Method
- Participant developed intervention or not
- Findings/results
- Recommendations for further research

All of the above parameters were kept for each research studies in worksheet to see overall findings. To complete data analysis process, all research studies involved in analysis were read critically by two times in order not to miss any relevant information. Later on, a qualitative data analysis program called MAXQDA (version 18) was used to deepen analysis procedure. All research studies integrated into this software (inserted into a document system) and coded section by section (research aim, research problem, research questions, theoretical base, research methodology, data collection/analysis, findings, further research suggestion and etc.) in order to ease

interpretation of analysis results (see Appendix C for coding scheme). This well-known qualitative data analysis program offers many facilities during interpretation of analyzed data. For instance, it reports (or retrieves) coded segments for each documents (here research study). By this property, a researcher can see a specific coded segment for all documents at the same time. Through benefiting from opportunities of above mentioned program, all research studies further coded thematically. As mentioned above in data evaluation section, 60 publications (55 research articles and 5 dissertations) were coded section by section throughout this software. For instance, segments or sentences which imply or directly states purpose of study were coded by using 'research aim' term. Then all of these coded segments with this term (research aim) retrieved (reported in software) for all publications and further coded by using short terms such as 'motivation' for research studies which aim to inspect motivation factor or 'achievement' for research studies which aim to investigate achievement change. Like research aim, this coding scheme was used for all sections of research study as follows; research questions, theoretical framework, data collection, data analysis, findings, further research. By this way, findings from data analysis part were reported visually.

3.2.1.5. Interpretation of results

Interpretation of results is the step for estimating and averaging effect sizes and searching for moderators of their variability (Cooper et al., 2009). Since, it is not possible to find reported effect size for all studies, there are some methods to estimate effect size from other statistical metrics. "Proper interpretation of the results of a research synthesis requires careful use of declarative statements regarding claims about the evidence, specification of what results warrants each claim, and any appropriate qualifications to claims that need to be made" (Cooper et al., 2009, p. 14). While interpretation of results handled with averaging effect sizes for the meta-analysis study, it is different for the qualitative meta-analysis or shortly meta-synthesis. For the meta-synthesis study, interpretation of findings is to summarize

findings from each individual studies and thematize them in order to create a conceptual framework. For the current study interpretation of results was handled by summarizing of findings obtained from in-depth data analysis through spreadsheet and qualitative data analysis program. This summarization was done by using thematic coding through qualitative data analysis program as mentioned in data analysis section above.

3.2.1.6. Presenting Findings

Presenting findings is the step of presenting the background, methods, results, and meaning of a research synthesis' findings (Cooper et al., 2009). Besides, "charts, graphs, and tables should be used to summarize the numbers in a meta-analysis, along with a careful intertwining of narrative explication to contextualize the summaries" (Cooper et al., 2009, p. 14). This is the last step of the meta-analytic study that presents findings as more understandable and visual way (charts, graphs, tables, diagrams, figures etc.) to the people who interested in specified topic. To visualize findings and creating a conceptual framework, charts and bar graphics were used for each sections (research aim, research question, findings and etc.) and illustrated in results section of the study. By this way, readers of this study were provided to see general tendency with respect to digital storytelling studies such as which research method preferred mostly or which theoretical base was associated with digital storytelling studies frequently.

3.2.2. Part II: Opinions of Field Experts

Main purpose of this part of the study is to find out field experts' opinions about what kind of digital storytelling studies are needed for future researches. Within the scope of this purpose, narrative research study design was employed for the second part of the study. Narrative research provides an opportunity of accessing the personal experience of participants and used increasingly in studies of educational experience (Connelly & Clandinin, 1990). As a strategy of inquiry, a narrative research aims to understand the outcome of interpretation rather than explanation by obtaining its data

from real life and lived experiences (Kramp, 2004). Moen (2006) defines narrative as "a story that tells a sequence of events that is significant for the narrator or audience or her or his audience" (p. 60). Thus, narrative research provides stories of lived experiences that are important for the owners. In this study, narrative research design was employed for obtaining opinions of field experts by involving their lived experiences to figure out the needs and directions related to future digital storytelling research studies. For data collection and analysis of the second part of the study, interview and thematic analysis method were employed.

3.2.2.1. Participants

Participants were selected by using purposive sampling and snowball technique without imposing restriction of nationality. Initially, criteria for selection of participants were defined and participants selected according to these criteria (purposive sampling) then each participant was asked about potential participants for study (snowball technique). For participants decided to be included in study whether using purposive sampling or snowball technique, voluntariness was taken as a basis. Initial requirements for participants of the study were to be educational technology field experts who are qualified on or engage in an educational use of digital storytelling by publishing an article or advising a dissertation/thesis study with respect to digital storytelling. Although educational technology field expertise is preferable for selecting and involving participants, participants from other fields such as communication, educational science and pre-service teacher education are also acceptable for inclusion as long as they have an expertise on digital storytelling.

Firstly, researchers of analyzed research studies were invited to participate into interview section. For this aim, they were informed about the purpose of this study and why they are needed to be interviewed by sending an e-mail. Then field experts who accepted to participate into an interview procedure by responding to an informative e-mail sent by researcher were interviewed firstly. At the end of the interview process, each participant was asked with whom researcher of the study should interview

according to them. Therefore, their suggestions about subjects to be involved in study were taken and some participants were determined by this way.

Totally, 13 field experts were involved in an interview section of this study. Among this participants, 12 of them have a nationality identical to researcher and accommodate in various cities in Turkey while 1 of them has the nationality of U.S.A. Among these subjects 2 were professor at well-known universities in Turkey and managed dissertation study about educational use of digital storytelling in the field of Instructional Technology as well as published some articles about digital storytelling. 2 of them have published a PhD thesis regarding educational use of digital storytelling in the field of instructional technology and work in public university as an assistant professor. 2 participants have published a master thesis about digital storytelling and are working as a research assistant and study on a digital storytelling as a PhD student. 1 participant has published a PhD thesis about digital storytelling in the field of Turkish Education and works as an assistant professor at public university in the same field. 1 participant has published a PhD thesis about digital storytelling in the field of educational science and works as an associate professor in the field of instructional technology at a public university. 1 participant has published a PhD thesis in the field of elementary school education and works as an assistant professor in the same field at a public university. 1 participant has published a PhD thesis about digital storytelling in the field of Physics Education. 1 participant has published publications (research articles) and managed thesis study about digital storytelling and works as an associate professor in the field of instructional technology at a public university. 1 participant was from the U.S.A. and has several articles published in the field of educational use of digital storytelling and works as an associate professor at a public university. Lastly, 1 participant has published some articles about digital storytelling by managing several workshops and works as an associate professor at a public university in Turkey. Among 13 participants, 7 were female and 6 were male. All information about participants was provided in Table 3.2 below;

Table 3.2. *Demographics of Participants*

Participant	Gender	Education Level	Working as	Department
P1	Male	PhD.	Prof.	Instructional Technology
P2	Male	PhD.	Assist. Prof.	Instructional Technology
P3	Female	MS.	Res. Assist.	Instructional Technology
P4	Female	PhD.	Prof.	Instructional Technology
P5	Female	MS.	Res. Assist.	Instructional Technology
P6	Male	PhD.	Assist. Prof.	Elementary School Education
P7	Female	PhD.	Assist. Prof.	Instructional Technology
P8	Male	PhD.	Assoc. Prof.	Instructional Technology
P9	Female	PhD.	Assist. Prof.	Turkish Education
P10	Male	PhD.	Assist. Prof.	Physics Education
P11	Female	PhD.	Assoc. Prof.	Instructional Technology
P12	Male	PhD.	Assoc. Prof.	Instructional Technology
P13	Female	PhD.	Assoc. Prof.	Communication

3.2.2.2. Instruments

After data were analyzed and coded in the first part, (inter)national field experts were interviewed in order to take their opinion about what kind of a digital storytelling study is needed in future. The interview protocol was formed in unstructured type by the researcher. Unstructured interview or in other name open-ended interviews involve open questions which means that the format or content of the answers obtained from the interviewees are not expected by the interviewer beforehand and these questions are used for exploring range of opinions (Sharp, Preece & Rogers, 2011). In order to obtain unbiased opinions, participants were not asked leading questions that prevent participants from reflecting their own ideas. Initially 16 questions were prepared by the researcher according to meta-synthesis results of the study. The results of the first part of the study (meta-synthesis) guided researcher about which issues must be addressed in relation to the research questions. Within this scope, the interview protocol prepared by the researcher involves 16 questions about main themes extracted from the first part of the study which are theoretical base, research aim, research problem, research methodology, and participant selection. In addition to these, the

interview protocol involves some other questions namely as defining digital storytelling, advantage/disadvantage of digital storytelling, scientific contribution of digital storytelling, evaluating digital storytelling in terms of learning and teaching, effects of technological developments on digital storytelling, and future expectations for digital storytelling. In order to enhance trustworthiness, the interview protocol written by researcher according to results of the first part of the study were submitted to evaluation of three professionals in Instructional Technology field. By obtaining their suggestions, the interview protocol was revised and 2 questions were added to initial version of the interview protocol. Thus, the interview protocol was finalized and made ready for an implementation. Before actual implementation of the interview protocol, it was employed to one field expert as a pilot and data obtained from this pilot implementation was involved in data analysis as well. After examining the transcript of this pilot implementation, one question was added to the interview protocol by taking a suggestion of the expert in the field of instructional technology. Finally, the interview protocol included 19 questions to collect data (see Appendix B). In addition, final interview protocol were translated into English for international interviewee and provided to three English Language Teaching (ELT) experts' opinions for improve its comprehensibility and language use. Some grammatical and structural corrections were made and English version of an interview protocol was also finalized for implementation. These 19 questions were distributed into 7 themes after analysis process as follows; *definition of digital storytelling* theme involves 1 question (question 1), *digital storytelling for teaching and learning* theme involves 5 questions (question 2, 3, 12, 15 and 17), *advantages and disadvantages of digital storytelling* theme involves 2 question (question 4 and 5), *research agenda for digital storytelling* theme involves 3 questions (question 6, 7 and 13), *research paradigm for digital storytelling* theme involves 2 questions (question 14 and 16), *theoretical and/or conceptual bases for digital storytelling* theme involves 4 questions (questions 8, 9, 10 and 11) and *future expectations/implications of digital storytelling* theme involves 2

questions (questions 18 and 19). Table 3.3 below shows these themes and corresponding interview questions.

Table 3.3. *Main themes and corresponding interview questions*

Themes	**Interview Questions**
Definition of digital storytelling	Q1
Digital storytelling for teaching and learning	Q2, Q3, Q12, Q15, Q17
Advantages and disadvantages of digital storytelling	Q4, Q5
Research agenda for digital storytelling	Q6, Q7, Q13
Research paradigm for digital storytelling	Q14, Q16
Theoretical or conceptual bases for digital storytelling	Q8, Q9, Q10, Q11
Future expectations/implications of digital storytelling	Q18, Q19

3.2.2.3. Data Collection Process

Data collection was made through individual interviews with the selected participants. Before an interview process, each participant was provided the results of the first part of study (meta-synthesis findings) to have pre-knowledge by reviewing overall structure of digital storytelling studies in K-12 education. Interviews were recorded by recording device in order for further analysis through transcribing. For the reason of not being in the same city or country, some participants' interview was done through phone call and recorded by using special voice recording program. For keeping confidentiality, interviewee were informed about the aim of sound record use and were granted that no one except for the researcher of the study will reach the sound records and make any process on them. After this informing, to be ethical, all interviewee's permission was taken for recording their voice during an interviewing process. The interviews took approximately 40 minutes.

3.2.2.4. Data Analysis Process

Data collected from the interview process analyzed by the researcher through the use of Braun and Clarke's (2006) thematic analysis defined as "…a method for identifying, analyzing and reporting patterns (themes) within data" (p. 79). The outcome of

thematic analysis is a set of themes (or patterns) extracted from a data set (analyzed section of all collected data) and have importance to address the research or a specific issue (Maguire & Delahunt, 2017). Thematic analysis has two types within themes or patterns identified differently as inductive (or bottom-up) thematic analysis and theoretical/deductive (or top down) thematic analysis (Braun & Clarke, 2006). In the first one, themes are identified by strongly linked to data itself and coding process is handled through not trying to fit it into a pre-existing coding frame, or researcher's analytic preconceptions, consequently it is more data-driven (Braun & Clarke, 2006, p. 83). On the other hand, in the latter one themes are identified by the researcher's theoretical or analytic interest in the area, hence it is more theory-driven (Braun & Clarke, 2006, p. 83). For this study, deductive thematic analysis was employed with the aim of extracting knowledge from data by depending on pre-determined main themes/headings that were revealed out from the first part of the study namely, *theoretical/conceptual base, purpose of study, research questions, research methodology, subjects, data collection, data analysis,* and *future research suggestions*. Braun and Clarke's (2006) thematic analysis is comprised of 6 phases/steps which were defined below by associating them to current study.

Step1. Becoming familiar with data is the first step of the analysis through which researcher handles with transcribing data (if not provided to researcher), reading and re-reading the data during which researcher writing down initial ideas about patterns and meanings. During this phase, it is ideally recommended to read entire data set at least once before beginning coding process through which ideas and identification of possible patterns are shaped (Braun & Clarke, 2006). In the current study, each individual sound record of participants carefully transcribed by typing every statement provided. Since, this process requires rigorous and thorough transcribing of a verbatim account of verbal and non-verbal utterances (Braun & Clarke, 2006, p.88), all verbal and non-verbal (i.e. coughs) statements were noted down in transcripts. In addition, each transcript was read again and again by listening to related sound record in order not to miss any statement provided by the participants. At the end of transcribing

process, entire data set (a collection of interview transcripts) was read before coding process and initial ideas were written down.

Step2. Generating initial codes is the phase of where set of codes initially begins to emerge by organizing data in a meaningful and systematic way (Maguire & Delahunt, 2017). Besides, coding is a process through which data reduced into small chunks of meaning (Maguire & Delahunt, 2017) and "allows researchers to simplify and focus on specific characteristics of the data" (Nowell et. al., 2017, p.5). During coding phase, Javadi and Zarea (2016) suggest to "pay complete and equal attention to all data and identify the important aspects in the data" (p. 36) that may form "the basis of repeated patterns across the data set" (Braun & Clarke, 2006, p. 89). Coding can be done by using either explicit (semantic) or implicit (latent) way. In semantic way, codes (or in higher levels themes) were generated through the explicit or surface meanings of the data and the analyst (researcher) does not look for anything beyond what a participant has said and what has been written (Braun & Clarke, 2006, p. 84). On the other hand, in latent way, codes were generated by moving a step further through which analyst (researcher) starts to identify or examine the underlying ideas, assumptions, and conceptualizations (Braun & Clarke, 2006, p. 84). In this study, coding process was handled by using explicit (semantic) way and all codes were simply generated without moving beyond what participants have said. Since deductive thematic analysis was employed in this study, main themes/headings were specified before coding process; however, initial codes support these themes were not determined and they were decided to be driven from the data itself. Therefore, open coding technique (absence of pre-set codes) was employed while identifying codes. In this context, all interview transcripts were coded into meaningful chunks (or segments) by using qualitative data analysis software named MAXQDA. To do this, all meaningful parts of data were selected and assigned a code by drag-and-drop feature of the software.

Step 3. Searching for themes is the phase through which analyst/researcher "re-focuses the analysis at the broader level of themes, rather than codes, involves sorting the

different codes into potential themes, and collating all relevant coded data extracts within the identified themes" (Braun & Clarke, 2006, p. 89). Actually, researcher starts to analyze and organize codes created in previous phase and thinks over how to combine different codes into overarching themes (Braun & Clarke, 2006). Furthermore, this phase is where relationship between codes, between themes, and between different level of themes (main overarching themes and sub-themes within them) is formed (Braun & Clarke, 2006) and decisions were made about which initial codes may put into main themes whereas others may be attached into sub-themes and others still may be discarded (Braun & Clarke, 2006; Javadi & Zarea, 2016). Therefore, all interview transcripts were re-examined in order to form main themes and sub-themes by using qualitative data analysis program mentioned above. Within this scope, initial themes were created and codes fit into these themes were moved by again using drag-and-drop feature of the software. This phase was ended with a collection of candidate themes, and sub-themes, and all extracts of data that have been coded in relation to them (Braun & Clarke, 2006).

Step 4. Reviewing themes is the phase where initial themes are re-organized by making some decisions, e.g. reduction of themes or combining of themes. Essentially, this phase allows researcher to look overall theme structure and re-organize them by considering the inner data extracts or codes. Therefore, it becomes clearer that some candidate (or initial) themes are not really themes (lack of enough data to support them or existence of too diverse data), whereas other themes may collapse each other (two apparently separate themes might form one theme) and others still might need to be broken down into separate themes (Braun & Clarke, 2006, p.91). There emerges two issues to be considered at this phase; *internal homogeneity* and *external heterogeneity*. Internal homogeneity means that data within themes should cohere with together meaningfully and external heterogeneity means that there should be clear and identifiable distinctions between themes (Braun & Clarke, 2006; Javadi & Zarea, 2016). Reviewing and refining themes in this phase were done through two levels (Javadi & Zarea, 2016). In the first level, researcher goes back to the extracted codes

of each theme in order to be sure whether codes form a consistent pattern (Braun & Clarke, 2006; Javadi & Zarea, 2016). If this condition was met, researcher moves to second level through which the validity of individual themes is checked with relation to whole data set. Maguire and Delahunt (2017, p. 3358) provides some guiding questions to consider at this phase as follows;

- Do the themes make sense?
- Does the data support the themes?
- Am I trying to fit too much into a theme?
- If themes overlap, are they really separate themes?
- Are there themes within themes (sub-themes)?
- Are there other themes within the data?

In current study, in the lights of the information and guiding questions above, all codes and themes were re-considered and re-organized to be sure that all individual themes or sub-themes has enough data to be supported and are distinct from others. In other words, it is guaranteed that internal homogeneity and external heterogeneity were met. In this sense, some themes were combined to form overarching theme, whereas some themes were reduced because of lack of supportive data and redundancy. The final outcome of this phase is thematic map that summarizes and describes whole data set similar to concept or mind map. For this study, thematic map finalized through qualitative data analysis program (MAXQDA with the tree structure shown below in Figure 3.1.

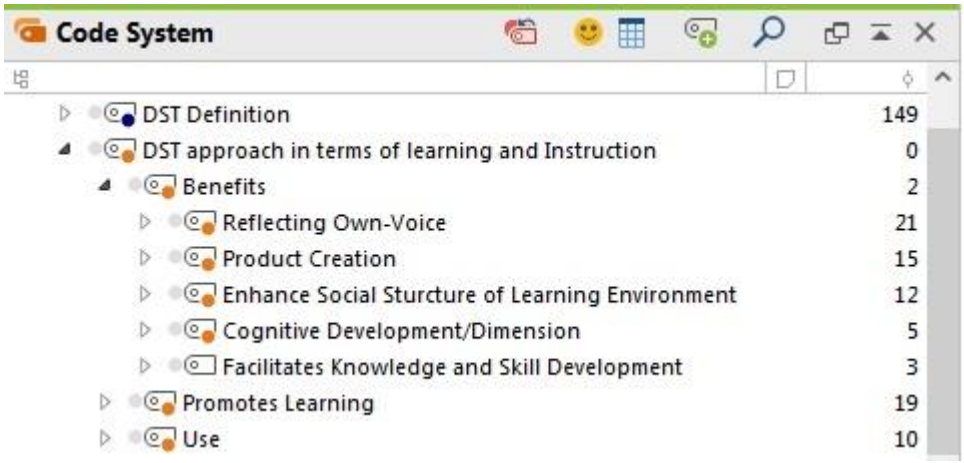

Figure 3.1. A Section of Finalized Themes in Tree Structure (MaxQDA18)

As seen from the Figure 3.1 above, theme structure is in tree form through which main themes are shown in upper level and sub-themes in lower level. In the Figure 3.1 for example, *DST Definition* and *DST approach in terms of learning and instruction* are main themes (stay at top level) and *benefits* (has its sub-themes also), *promotes learning* and *use* are the sub-themes (stay at lower level inside the corresponding main theme).

Step 5. Defining and naming themes is the process of "identifying the 'essence' of what each theme is about (as well as the themes overall), and determining what aspect of the data each theme captures" (Braun & Clarke, 2006, p. 92). Furthermore, themes are re-named so that readers have a clear sense of what the theme is about, hence at the end of this phase researcher can define clearly what the themes are about and what they are not (Braun & Clarke, 2006). In this study, some re-arrangements were done by re-naming of some themes in order to improve lucidity. Codes and themes were provided (some parts) in the Appendix D.

Step 6. Producing the report is the final step/phase of thematic analysis and the aim is to tell the complicated story of analyzed data in a way which convinces the reader of the merit and validity of analysis (Braun & Clarke, 2006). It is important to provide sufficient evidence of the themes within data by directly presenting data extracts which

capture the essence of the point researcher demonstrates (Braun & Clarke, 2006). For this study, outcome of this phase provided in findings section by creating a meaningful whole in the light of main themes and sub-themes supporting them.

3.2.2.5. Trustworthiness and Triangulation

For ensuring validity issue, participants were not asked extra leading questions that distract their attention and effect their reflection of ideas. In order to assuring reliability (or trustworthiness) interview questions were presented to review of experts in the field of instructional technology and English language education (for English version of questions). In addition, structure of codes, themes and sub-themes was finalized by negotiating with an expert in the field of instructional technology during data analysis phase. Furthermore, for the issue of trustworthiness, one additional researcher in the field of instructional technology who has an expertise in qualitative research was provided transcripts of 3 participants (20% of total subjects) and asked to analyze it by using thematic analysis. After researcher finished analyzing of these transcripts, his coding scheme was compared with coding scheme of the researcher. This comparison was made by negotiating with him and overall inter-rater agreement score was calculated as 96%. In addition to interview transcripts, for the first part of the study, 6 publications (10% of total publications) were provided to second researcher having expertise in qualitative data analysis and asked to analyze it by using thematic analysis method. Then, the coding scheme was compared the one which researcher revealed before. This comparison was made again by negotiating the second researcher and overall inter-rater agreement score was estimated as 87%.

3.3. Role of the Researcher

The researcher tried to be non-biased throughout the study as much as possible. During data collection for the first part of the study which is selection of relevant digital storytelling publications, criteria set considered and publications that did not meet with criteria set were eliminated for analysis definitely. For the second part, interviews were conducted without directing interviewee by posing extra questions or making

comments. Besides, during analysis process of publications and expert interviews, codes were created by standing out of personal bias by being lucid as much as possible and giving clear codes to corresponding textual segments. It’s important to state here that researcher did not conducted any empirical study about educational use of digital storytelling.

CHAPTER 4

FINDINGS

In this section findings of the study reported in line with research questions. Therefore, findings of study compromised of two sections; a meta-synthesis findings and interview result of filed experts.

4.1. Characteristics of Research Studies about Digital Storytelling: Meta-synthesis Findings (RQ1)

With the first research question it's aimed to provide a comprehensive look for digital storytelling research studies at K-12 level through systematic analysis. Summary of the findings are provided in Table 4.1 below. Each theme namely *theoretical framework, purpose of studies, research questions, research methodology, bases for digital storytelling research studies, subjects, data collection methods, data analysis methods, findings of digital storytelling research studies, suggestions for further research* in the table was reported in the following sections. In Table 4.1 the findings with the highest frequency are provided, more detailed findings are provided under the related sub-headings.

Table 4.1. *Summary of Meta-analysis Findings of Digital Storytelling Studies*

Theme	**Sub-Themes (only top three)**	**Frequency**
Theoretical Framework	Constructivism	26
	Multiliteracies Pedagogy	4
	New Literacy Theory	3
Purpose of Studies	Achievement	18
	ICT Use	16
	Language Use	14
Research Questions	Achievement	26
	Opinions	14
	ICT Use	9

Research Methodology	Quasi-Experimental	16
	Not Clearly Stated	13
	Mixed Method	10
Bases for Digital Storytelling Research Studies	Lambert's (2010) 7 Elements	14
	Robin's (2005, 2008) Steps	10
	Kearney's (2009,2011) 4 Phases	2
Subjects	Grade 6-8	22
	Grade 1-5	12
	Grade 9-12	12
Data Collection Methods	Interview	44
	Scales	26
	Learner Artifacts	20
Data Analysis Methods	Inferential Statistics	38
	Thematic Coding/Analysis	18
	Descriptive Statistics/Analysis	11
Findings of Digital Storytelling Research Studies	Achievement	21
	Technical / ICT Skills	17
	Motivation	17
Suggestions for Further Research	Research-based Considerations - implementation for other subject areas (8) - long-term studies (6) - comparative studies (5)	63
	Participants - from range of contexts (9) - larger sample (8) - different grade levels (5)	24
	Digital Storytelling Implementation - more specific instructional strategies (3) - multi-modal learning (1) - secondary education (1)	10

4.1.1. Theoretical and Conceptual Framework

Results of analysis of theoretical bases that researchers rely on when they conduct Digital storytelling studies are shown in Table 4.2 and Figure 4.1 below;

Table 4.2. *Theoretical and Conceptual Bases used among Digital Storytelling Studies*

Theories	**Frequency**	**Publications**
Constructivism	26	*
Multiliteracies Pedagogy	4	[38] [40] [18] [3]
New Literacy Theory	3	[2] [45]
Dialogical Approach	2	[42] [39]
Critical Literacy Theory	2	[3] [13]
Cognitive Developmental Theory	1	[21]
Critically Engaged Performance Pedagogy	1	[28]
Double Diamond Design Process Model	1	[28]
Global Sharing Pedagogy	1	[34]
Critical Race Theory	1	[41]
Ecological Systems Theory	1	[53]

* Publications using theories under constructivism stated in table 4.3 below.

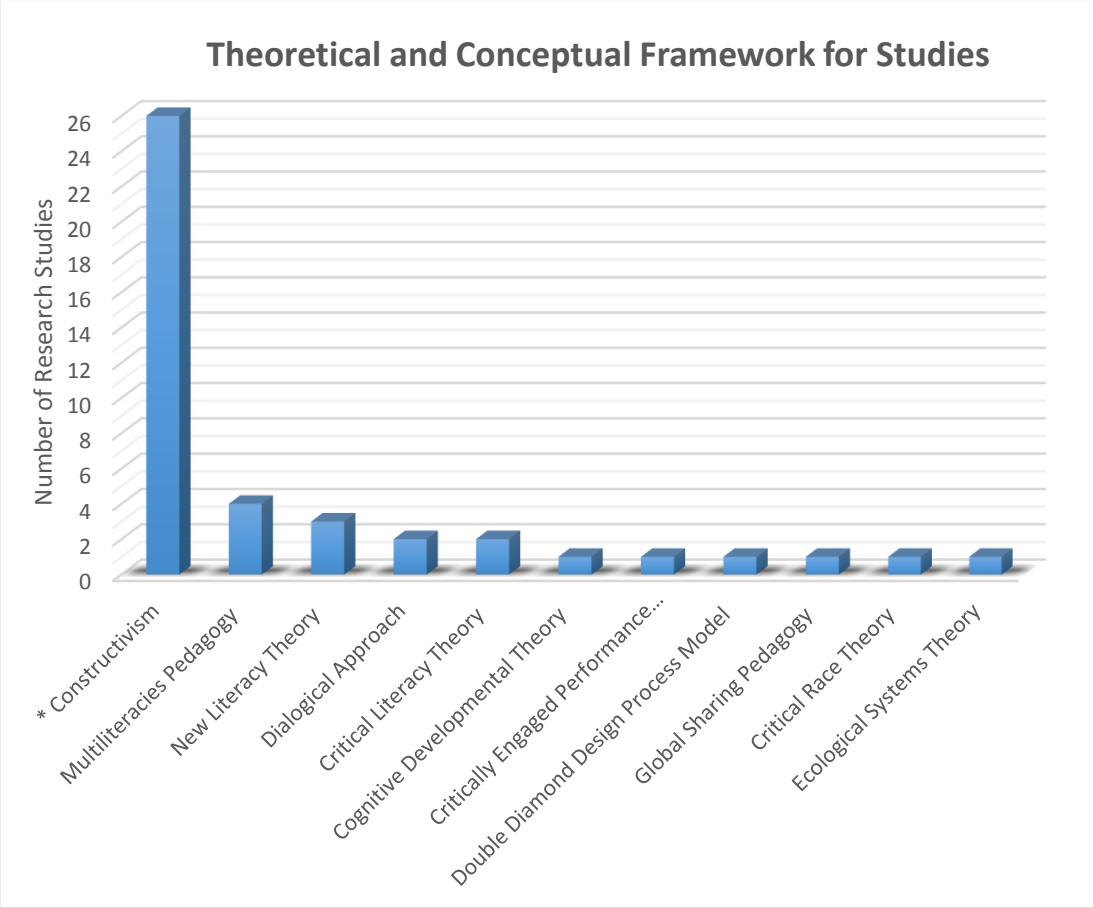

Figure 4.1. Theoretical Bases of Digital Storytelling Research Studies
* see theories under Constructivism in table 4.3.

As seen from the Figure 4.1 above, scholars mostly based their research studies on *constructivism* (26). As provided in Table 4.3, among the constructivist approaches, the most frequently used constructivist approach was social constructivism (13) and student-centered learning approach (2) followed this. Other constructivist approaches were also provided in Table 4.3 as Situated Cognition Theory, Situated Learning Theory, Symbolic Instructionism, Cognitive Apprenticeship, Community of Learners/Practice, Constructionism, Inquiry-based Learning, Active Learning, Reflective Thinking and Self-directed Learning (*f*=1 respectively). Furthermore, researchers are impressed from *mulilliteracies pedagogy* (4) as a theoretical base when designing their studies. Thirdly, researchers also referred *new literacy theory* (3) while conducting digital storytelling studies. Apart from these three mostly preferred theoretical bases, researchers are also impressed from dialogical approach (2), critical literacy theory (2), cognitive developmental theory (1), critically engaged performance pedagogy (1), double diamond design process model (1), global sharing pedagogy (1), critical race theory (1) and ecological systems theory (1).

Table 4.3. *Constructivist Approaches*

Theories	**Frequency**	**Publications**
Social Constructivism	13	[8][53][21][42][39] [51][45][3][2]
Student-centered Learning Approach	2	[36][12]
Situated Cognition Theory	1	[21]
Situated Learning Theory	1	[30]
Symbolic Instructionism	1	[31]
Cognitive Apprenticeship	1	[35]
Community of Learners/Practice	1	[50]
Constructionism	1	[19]
Inquiry-based Learning	1	[5]
Active Learning	1	[8]
Reflective Thinking	1	[16]
Self-directed Learning	1	[59]

4.1.2. Purpose of Studies

Purpose of research studies analyzed and coded thematically. While frequencies of themes were being calculated, statements that support each theme were taken into consideration. In other words, frequency of themes is independent from the quantity of research studies analyzed throughout the study since one study may aim to investigate more than one construct at the same time (each construct coded separately). Result of this thematic analysis presented below in Table 4.4.

As seen from the Table 4.4 below, scholars mostly insisted on *achievement* factor (18) when designing a digital storytelling research. This shows that they mostly preferred to look at impact of digital storytelling on students' learning achievement with respect to a specific course such as language and social studies. ICT (Information and Communication Technology) use is another factor (16) that researchers were interested in when designing a DST study. When overcoming with digital storytelling activity, how teaching and learning can be improved was the main concern of researchers who investigate ICT use dimension. Therefore, in the scope of ICT use, they aimed to investigate technology integration dimension (12), computing skills (3) and comparison of technology use inside/outside of the school (1). In addition to ICT use, scholars also considered *language skills* (14) when conducting digital storytelling studies. In this context, they investigated effect of digital storytelling on students' reading, writing, speaking skill development in both native and foreign language. Motivation (11) was also inspected by researchers more frequently when designing DST research. Within this scope, they investigated how students' learning motivation is affected when dealing with digital storytelling. Scholars also regarded taking opinions of both teachers and students (9) about creating a digital story. When table 4.4 below examined, it seen that learning identity (6), attitude (6), collaboration (5), creativity (4), engagement (4), learning outcomes (4), community (3) and thinking skills (3) follow above mentioned five mostly preferred factors (see Table 4.4 for

entirety of aims). Findings related to purpose of digital storytelling research studies were also presented in Figure 4.2 below.

Table 4.4. *Purpose of Digital Storytelling Research Studies*

Main	**Sub**	**Frequency**	**Publications**
Achievement		18	[15][56][57][58][59] [60][32][26][38][21] [46][54][52][33][45]
ICT Use	- Technology Integration (12) - Computing Skills (3) - Comparing Technology Use In/Out of School (1)	16	[1][23][50][36][9][13] [22][26][28][34][37] [38][42][44][55]
Language Skills		11	[5][3][7][1][18][9] [14][4][37]
Motivation		9	[7][10][48][22][32][21][58][60][34]
Opinions	- Opinion (8) - Perception (1)	6	[15][59][8][9][15][54]
Learning Identity		6	[12][56][9][35][20]
Attitude		5	[12][59][9][56][58]
Collaboration		4	[1][17][6][8]
Creativity		4	[7][8][37]
Engagement	- Engagement (3) - Critical Engagement with History (1)	4	[35][34][55][28]
Learning Outcomes	- Learning Strategies (2) - Learning Outcomes (1) - Impact of DST on Learning (1)	4	[59][58][5][12]
Social Inclusion		3	[8][47]
Thinking Skills	- Critical Thinking (2) - Reflective Thinking (1)	3	[19][32][16]

Enhancing/Expanding Teaching Practice		2	[13][8]
Experience of DST Implementation		2	[29][30]
Cultural Identity		2	[39]
Intercultural Understanding	- Intercultural Understanding (1) - Overcoming Racism (1)	2	[1][41]
Decision Making Skills		1	[19]
Social Skills		1	[8]
21st Century Skills		1	[1]
Co-Creativity		1	[6]
Commitment		1	[8]
Autonomy		1	[5]
Elimination of Misconceptions		1	[11]
Multilingual Identity		1	[3]
Bring About Change		1	[31]
Make Learners to Take action		1	[31]
Binding teaching/ learning with real life		1	[28]
Critical Socio-Educational Focus		1	[27]
Multimodal Skills		1	[24]
Online Presence		1	[47]
Memory		1	[46]
Shifting Horizon		1	[25]
Building Relationship (with students)		1	[25]
Gender Effect		1	[59]
Problem Solving		1	[21]

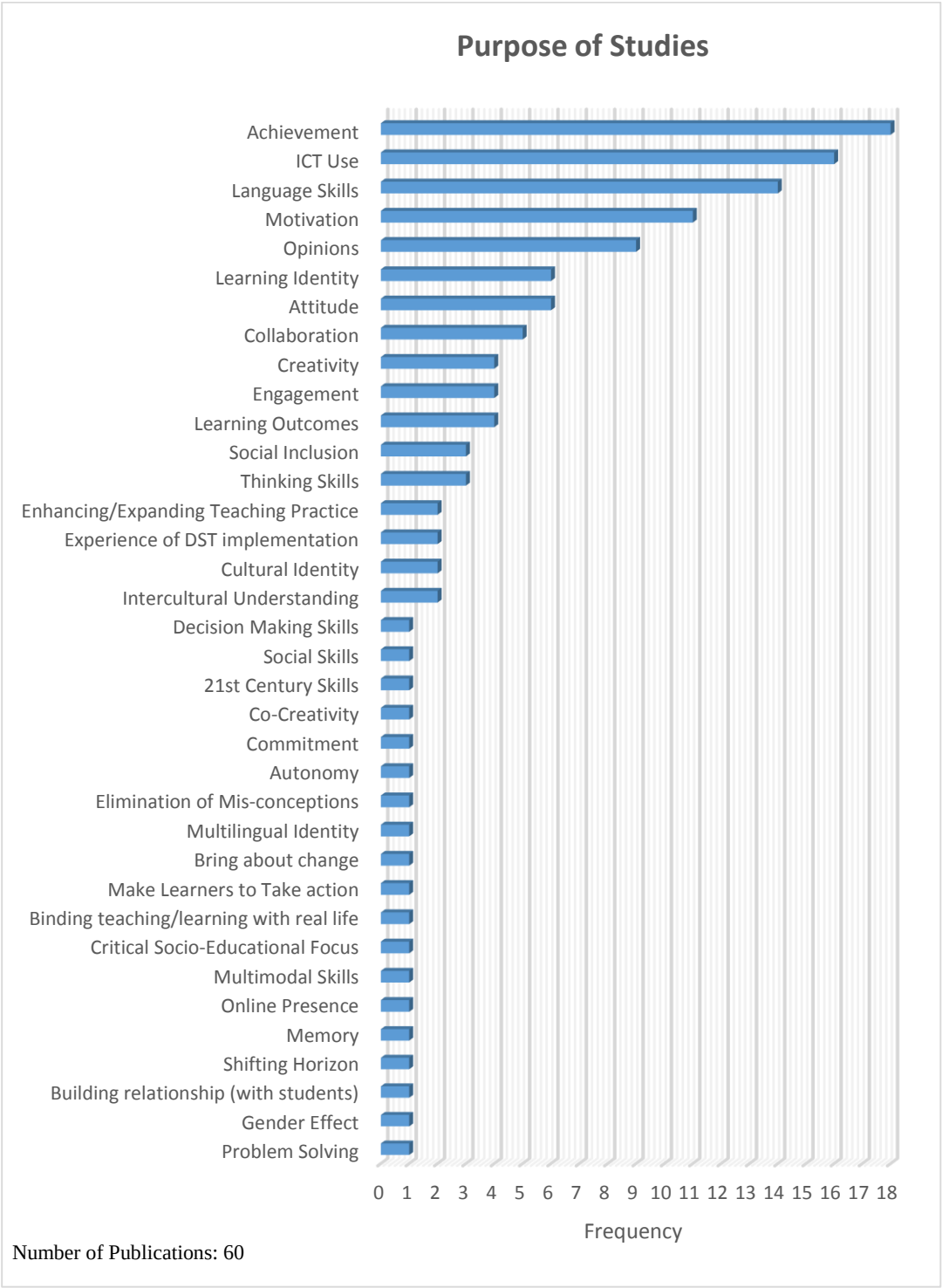

Figure 4.2. Frequency Distribution of Digital Storytelling Research Study Aims

4.1.3. Research Questions

This section shows thematic coding of research questions reported in digital storytelling research studies. While frequencies of themes were being calculated, statements that support each theme were taken into consideration. In other words, frequency of themes is independent from the quantity of research studies analyzed throughout the study since each research question in one study may point out different construct (i.e. one research question may point out achievement while another one point out motivation). Findings of thematic analysis regarding to research questions of digital storytelling research studies were presented in Table 4.5 below.

As seen from the Table 4.5 below, researchers most frequently investigated academic *achievement* (26) of students with respect to specific course in their research questions. Secondly, they took *opinions* (14) of students and teachers in terms of digital storytelling procedure. Thirdly, scholars investigated *ICT use* (9) dimension in their research studies. Fourthly, *motivation* (9) of students is also inspected by researchers whether digital storytelling has an impact or not. Furthermore, researchers looked into change in students' *literacy skills* (6) and *attitude* (6) during digital storytelling activity. In addition to these five frequently inspected variables, scholars interrogated some other factors or constructs as follows; engagement (4), learning outcomes (4) product quality (3), learning identity (3), community (3), social/communication skills (2), creativity (2), anxiety (2), collaboration (2), gender effect (2), co-creativity (1) and etc. (see Table 4.5 for details).

Table 4.5. *Research Questions of Digital Storytelling Research Studies*

Main	Sub	Frequency	Publications
Achievement		26	[59][12][11][21][58][32] [47][60][3][7][8][9][18] [14][4][33][37] [45][52][54]
Opinions		14	[59][57][58][55][54][50] [26][60][49]
ICT Use		9	[3][8][26][42]

			[20][23][37]
Motivation		9	[10][7][21][22] [58][32][33][60][48]
Attitude		6	[12][59][9][56] [57][58]
Literacy Skills		6	[20][52][7]
Engagement		4	[33][34]
Learning Outcomes	Learning Strategies (2) Learning Outcomes (2)	4	[59][58][5][21]
Product Quality		3	[59][33][45]
Learning Identity		3	[23][12][56]
Social Inclusion		3	[8][47]
Social/Communication Skills		2	[8][17]
Creativity		2	[7][8]
Anxiety		2	[5]
Collaboration		2	[1][17]
Gender Effect		2	[59][21]
Thinking Skills	Reflective Thinking (1) Critical Thinking (1)	2	[16][19]
Co-Creativity		1	[6]
Emotional Experience		1	[5]
Teacher Development		1	[3]
Learning Context		1	[51]
Online Presence		1	[47]
Memory		1	[46]
Cultural Identity		1	[25]
Shifting Horizon		1	[25]
Teacher's Role		1	[3]
Serving as a Bridge		1	[23]
Problem Solving		1	[21]

In order to improve comprehensibility, findings related to research questions of digital storytelling research studies were also provided graphically in Figure 4.3 below.

Figure 4.3. Findings Related to Research Questions of Digital Storytelling Research Studies

4.1.4 Research Methodology

This section shows research methodology preferred by scholars while designing their digital storytelling studies. Below Table 4.6 shows the distribution of research methodologies of analyzed research studies.

As seen from Table 4.6 below, the great majority of scholars preferred to use *quasi-experimental* (16) research methodology relatively. Secondly, research studies that do not clearly state research methodology followed this with the term of "*not stated*" (13) as seen from Table 4.6. Furthermore, *mixed method* (10) and *case study* (10) research methodologies were also used by some scholars to a large extent. *Action research* (5) followed them with a respectable amount. Although they are not used substantially, *experimental method* (3), *community-based participatory research* (2), *ethnography* (1), *and narrative inquiry* (1) research methodologies were preferred by some scholars while designing digital storytelling studies.

Table 4.6. *Research Methodology Used in Digital Storytelling Studies*

Methods	**Frequency**	**Publications**
Quasi-Experimental	16	[21][22][32][15][5][7][36][16] [44][46][9][18][12][10][48]
Not stated	13	[23][24][27][28][29][30][34] [40][41][51][53][1][14]
Mixed Method	10	[54][56][57][58][59][26][8] [60][26][50]
Case study	10	[55][2][4][6][38][42][17] [49][19][52]
Action Research	5	[33][37][39][45][11]
Experimental	3	[20][43][47]
Community-based Participatory Research	2	[31][25]
Ethnography	1	[3]
Narrative Inquiry	1	[13]

Findings related to research methodology preference of researchers of the digital storytelling studies were also presented graphically in Figure 4.4 below.

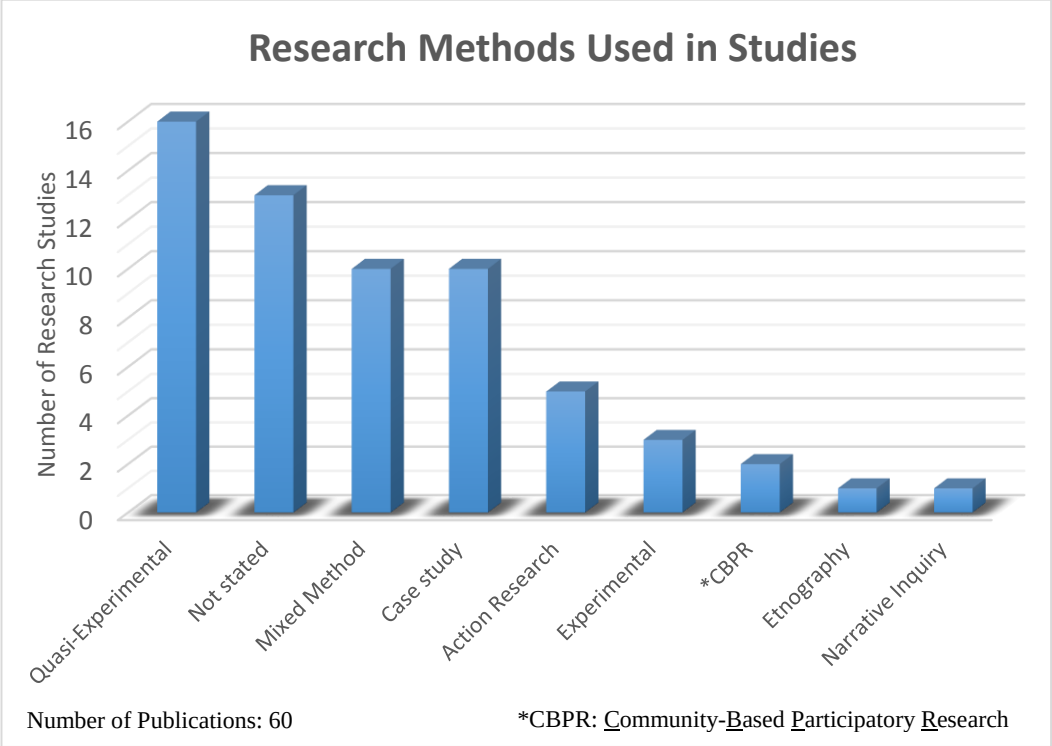

Figure 4.4. Research Methodology Used in Digital Storytelling Studies

4.1.5. Bases for Digital Storytelling Research Studies

Digital storytelling requires some steps to be applied in a creation process and these steps were defined differently by some experts in the field. Research studies that are selected to be analyzed also examined with respect to these guidelines or steps and presented below with Table 4.7.

Table 4.7 below shows bases stated in digital storytelling research studies. Some of these bases were cited in methodology part while some of them were referred in literature part of the studies. As seen from Table 4.7, Lambert's (2010) 7 key elements for creating a digital story (14) were mentioned in a great majority of research studies. This key elements were specified briefly in literature review section and named as follows; point of view, dramatic question, emotional content, economy, pacing, the gift of voice and soundtrack. Among research studies that mention Lambert's 7-step

approach, 12 of them placed it in literature review section while 2 of them mentioned it in research methodology part. Secondly, Robin's (2005, 2008) 10 steps and strategies to consider for a great digital story (10) were stated by scholars. These steps are as follows; (1) find your story, (2) map your story, (3) capture your audience's attention right away and keep it, (4) tell your story from your unique point of view, (5) use fresh and vivid language, (6) integrate emotions, (7) use your own voice in the script and in the audio, (8) choose your images and sounds carefully, (9) be as brief as you can be and (10) make sure your story has a good rhythm. Among these 10 research studies that mention Robin's 10 step approach for a great digital story, 4 of them mentioned it in research methodology section while 6 of them mentioned in literature review section of the study. Furthermore, Kearney's (2009, 2011) 4 phases of story creation (2) were also stated by some researchers and these four phases are pre-production, production, post-production and distribution. Ohler's (2013) 5 stages of digital story creation (2) is also referred by some scholars in their digital storytelling studies. This 5 stages of digital story creation is actually compromised of adding one more steps to Kearney's 4 phases of story creation as planning of story, pre-production, production, post-production and delivery stage. There are some other step-wise approaches for digital story creation as seen from Table 4.7, however; all of them almost overlap with each other.

Table 4.7. *Bases for Digital storytelling Research Studies*

Methods	**Frequency**	**Publications**
Lambert's (2010) elements	14	[55][56][57][58][60] [27][15][20][44][47][12][52]
Robin's (2005,2008) steps	10	[57][26][32][20][44] [47][27][40][52]
Kearney's (2009, 2011) 4 phases of Story creation	2	[57][47]
Ohler's (2013) 5 stage of DST creation	2	[46][52]
Barret's (2009) 5 steps for DST creation	1	[57]

Tolisano’s (2008) 3 steps for DST creation	1	[57]
Jakes & Brennan’s (2005b) 6 steps for DST creation	1	[57]
Framework for a DST model (Figg, Ward, & Guillory, 2006)	1	[47]
Kajder's (2004) 6 steps of DST	1	[35]
6+1 traits of effective writing (Culham, 2003)	1	[35]
Meadow's (2003, 2011) digital story structure	1	[30]
Banszewski’s (2005) 5 Steps for DST Creation	1	[4]

Above mentioned findings related to conceptual bases were also provided in Figure 4.5 in order to see differences more clearly.

Figure 4.5. Bases stated in Digital Storytelling Research Studies

4.1.6. Subjects

Subject group of digital storytelling studies was set as K-12 at the beginning of research. Therefore, all K-12 studies were found and analyzed. This sections shows classification of subject groups of DST studies according to grade levels. Table 4.8 below shows grade level distribution of participants in digital storytelling studies. Scholars mostly took participation of secondary school (grade 6 – 8) students (22). Primary school (grade 1 - 5) and high school (grade 9 – 12) students were also taken by researchers as participants for DTS studies to a large extent (12). The least preferred participant group by researchers was pre-school students (2).

Table 4.8. *Grade Levels of Participants among Digital Storytelling Research Studies*

Methods	Frequency	Publications
Grades 6-8	22	[38][20][54][39][48][36][49][35][37][40][50] [31][1][2][4][5][6][7][8][15][16][18]
Grades 1-5	12	[46][51][34][43][53][21][52][23][33][10][11][14]
Grades 9-12	12	[16][42][47][32][41][25][55][9][12][13][17][19]
Pre-School	2	[30][44]

Findings related to target group preferences of scholars in digital storytelling studies were also provided in Figure 4.6 below. However, in the Figure 4.6 grade level was taken as a basis for showing results rather than frequency. This means that grade levels were presented in increasing way from pre-school to grades 9-12.

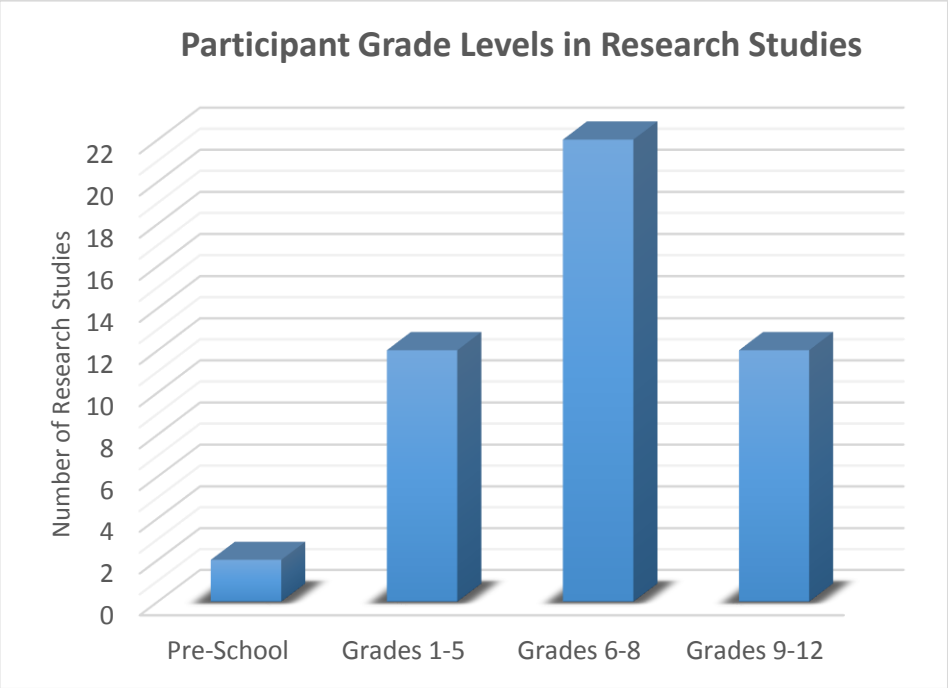

Figure 4.6. Grade Levels of Participants among Digital Storytelling Research Studies

4.1.7. Data Collection Methods

Researchers of selected research studies preferred a wide variety of qualitative and quantitative data collection methods as shown in Table 4.9 below. When Table 4.9 is examined, it's seen that the great majority of researchers preferred to use *interview* method (44) for data collection. Among those, 34 used individual interview method and 10 used focus group interview method. Then, *scales* (26) are secondly preferred data gathering method by researchers for measuring a wide range of variables from attitudinal to motivational. Third preferred data gathering method is *learner artifact* analysis (20) through which researchers aim to reach personal profiles of learners by analyzing their created digital stories and product portfolios comprehensively and structurally. For research studies inspecting academic achievement of learners, researchers used different kind of *achievement tests* (20). Furthermore, researchers also used field notes (16) and observation methods (16) for data collection. Some other data collection methods as seen from the table are evaluation rubrics (12), questionnaire (12), video records (11), survey (9), audio records (7), reflection journals (7) and etc. (see Table 4.9 for detail).

Table 4.9. *Data Collection Methods in Digital Storytelling Research Studies*

Methods	**Frequency**	**Publications**
Interview -Individual interview (34) -Focus Group interview (10)	44	[38][29][31][34][37][42][52][19] [21][23][25][26][29][31][33][35] [36][37][38][41][42][45][49][50] [52][53][54][55][56][57][60][1] [2][3][3][6][8][9][11][13][15][17][59]
Scales	26	[5][12][59][18][22][14][10][60][56] [57][58][22][36][46][20][21][33]
Learner Artifacts	20	[24][25][29][30][31][33][35][36][37][39] [41][42][45][50][57][2][3][7][9][13]
Achievement Tests	20	[43][60][47][5][7][11][14][15][59] [57][58][54][48][46][20][21][32]
Field Notes	16	[24][25][30][35][37][38][39][41][42] [45][50][54][2][3][6][17]
Observation	16	[23][33][34][38][49][53][55][2][6] [8][15][17][26][52]

Evaluation Rubrics	14	[9][56][45][26][8][27][33][59]
Questionnaire	12	[34][37][52][54][55][19][32] [48][7][59][5][47]
Video Records	11	[24][25][35][37][38][42][45][50][57][51][6]
Survey	9	[24][29][34][44][47][49][50][4][7]
Audio Records	7	[24][30][39][42][45][51][6]
Reflection Journal	7	[37][55][57][9][4][15][17]
Demographic Information Form	3	[56][57][58]
Documentary	2	[51][8]
Online Forum and Blog	1	[37]
Inquiry	1	[29]

Information related to findings of data collection methods used in digital storytelling studies were also presented in Figure 4.7 below. Blue bars show qualitative data collection methods and orange ones shows quantitative data collection methods.

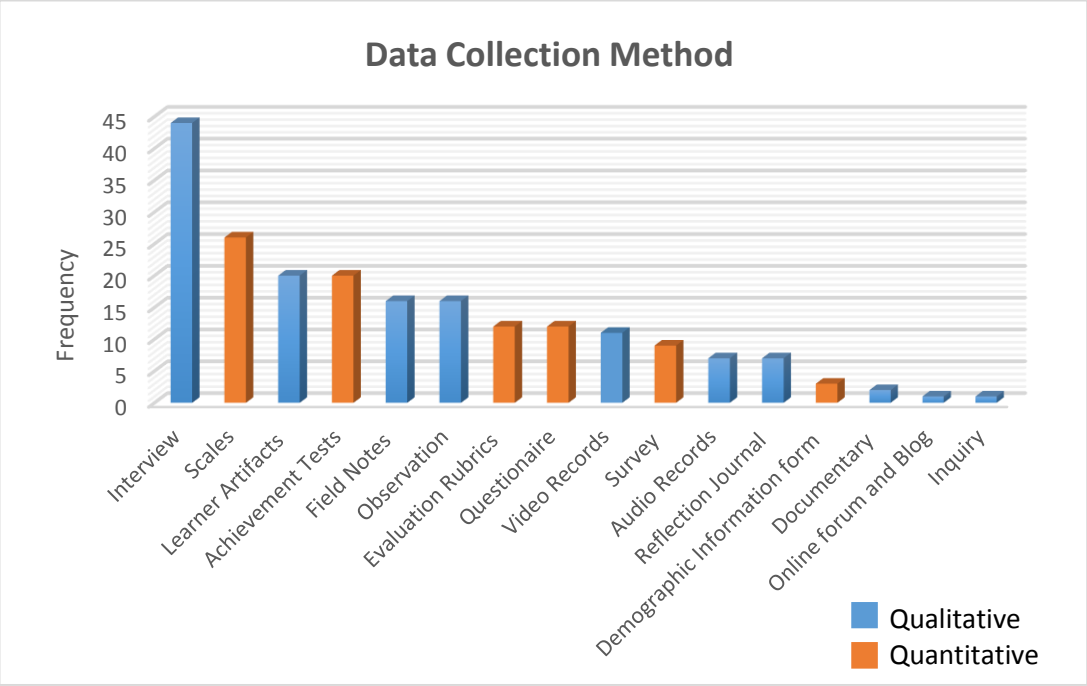

Figure 4.7. Frequency Distribution of Data Collection Methods in Digital Storytelling Studies

4.1.8. Data Analysis

When collected research studies were examined, it was seen that researchers used mainly qualitative, quantitative and mixed type of data analysis. Below Figure 4.8 shows data analysis types researchers used and Figure 4.9 shows data analysis techniques.

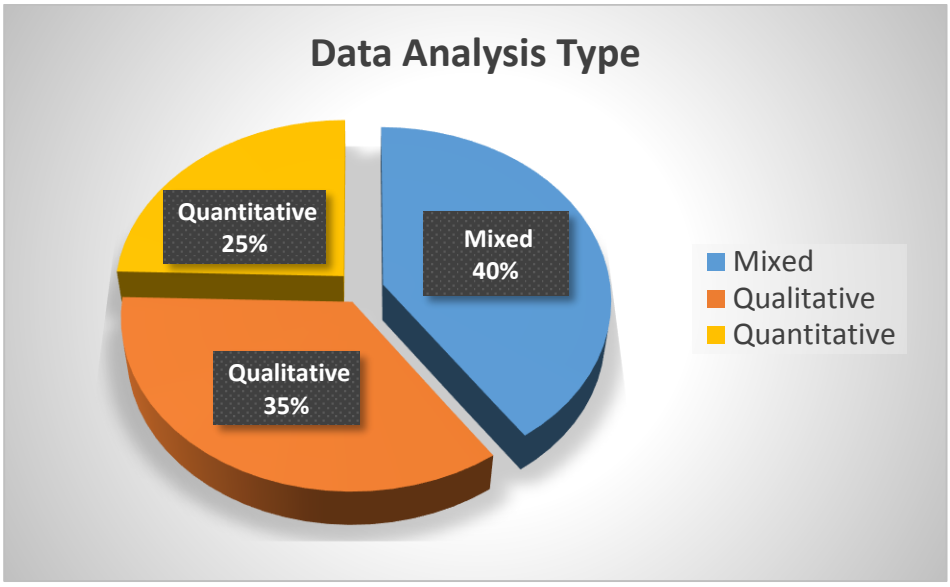

Figure 4.8. Data Analysis Type Used in Digital Storytelling Research Studies

As seen from Figure 4.8, in a great majority of research studies (*f*=23, 40%) *mixed* data analysis type was used. This shows that researchers tend to use both qualitative and quantitative data measurements and analysis. Secondly, in some of the research studies (*f*=20, 35%) only *qualitative* data analysis was used. Lastly, pure *quantitative* data analysis used by some researchers to a lesser extent (*f*=14, 25%).

Table 4.10 below shows data analysis methods used in digital storytelling. As seen from the graph, *inferential statistics* (38) is the most frequently preferred data analysis method by scholars to process their data. Within the scope of inferential statistics method, scholars used independent/paired sample t-test (11), Ancova (9), Anova (5), Mancova (3), mann-whitney u-test (3), correlation analysis (3), wilcoxon signed ranks

test (2), regression analysis χ^2 test (1). *Thematic coding/analysis* (18) is the second more preferred data analysis method in educational digital storytelling studies. Furthermore, *descriptive statistics/analysis* (11) is the third more preferred data analysis method among scholars of educational digital storytelling studies. Some other more frequently used data analysis methods are *artifact analysis* of learners' finished product (6), *content analysis* (5) (see Table 4.10 for details).

Table 4.10. *Data Analysis Methods in Digital Storytelling Research Studies*

Methods	**Frequency**	**Publications**
Inferential Statistics	38	[9][10][41][43][7][15][22][46][60][16][18] [20][32][47][48][58][34][44][7][57][12][45]
Thematic coding/analysis	18	[9][17][23][35][37][41][55] [2][17][45][51][55]
Descriptive statistics/analysis	11	[10][15][28][31][32][34][43][45][49][52]
Evaluation Rubric	8	[9][56][45][26][8][27][33][59]
Artifact Analysis	6	[42][3][26][27][30][39]
Content Analysis	5	[49][54][32][31]
Protocol Analysis	1	[32]
Textual narratives	1	[37]
Analytic Memos	1	[37]
Ethnographic Analysis	1	[39]
Dialogic discourse Analysis	1	[39]
Interaction Analysis	1	[42]

Information related to findings of data analysis methods used in digital storytelling studies were also presented in Figure 4.9 below. Blue bars show qualitative data analysis methods and orange ones show quantitative data analysis methods.

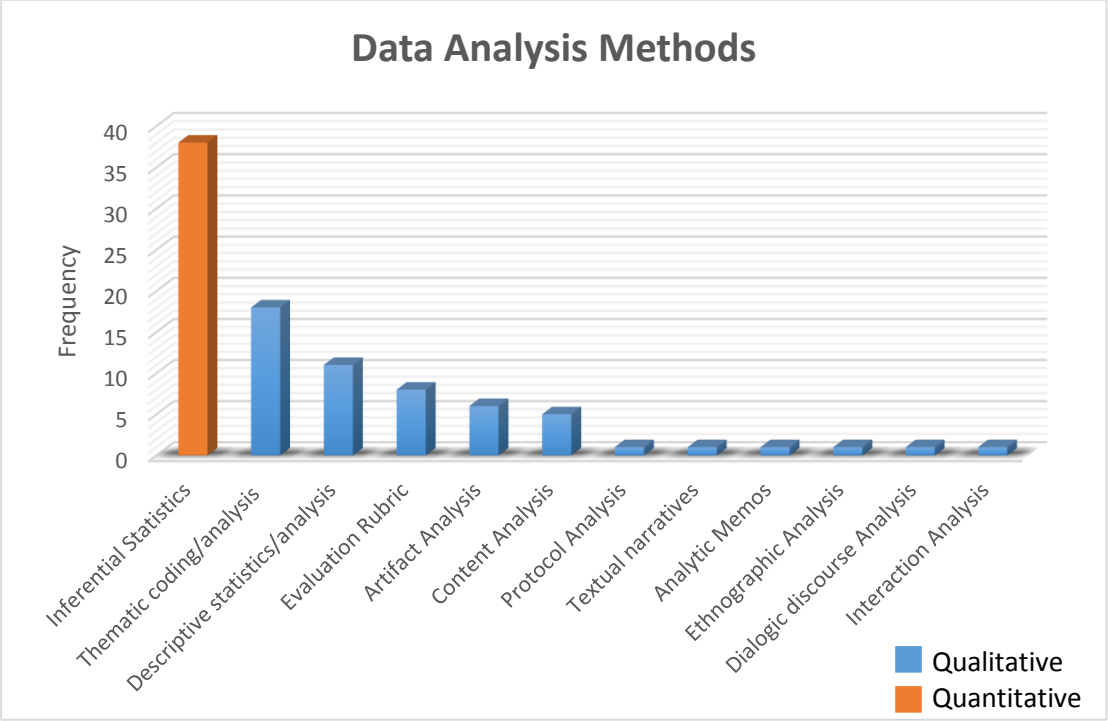

Figure 4.9. Data Analysis Methods Used in Digital Storytelling Research Studies

4.1.9. Findings of Digital Storytelling Research Studies

Table 4.11 below shows thematic analysis results of findings section of selected digital storytelling research studies. Being parallel with research aims and questions, *academic achievement* (23) is on the top of the list. This shows that a great majority of scholars conducting digital storytelling research studies loan over academic achievement and found that creating a digital story or being exposed to digital storytelling improves academic achievement of learners. Secondly, researchers found that digital storytelling is effective for improving *self-skills* (21), namely, self-control (9), self-confidence (6), self-reflection (4), self-production (1), self-awareness (1). Furthermore, it can be seen from the above graph that researchers found digital storytelling effective for improving *technical or ICT skills* (19) and *learning motivation* (19) of students. Some researchers found that digital storytelling improves *thinking skills* (14) that are namely critical thinking (8), creative thinking (5) and

comprehensive thinking (1). According to findings of some research studies it can also be said that digital storytelling increases *engagement* (14) of students and is found to be *entertaining* (14) for learners. In addition to these, digital storytelling was also found to increase *collaboration* (13) among students, facilitate *technology integration* (11), and improve *learning identity* (10) of students. Research studies inspecting attitudinal change of students reported that using digital storytelling in lecture improve *attitude* (7) of students toward learning or a specific course. It's also possible to see in some DST studies that dealing with creation of a digital story over and over, improve *quality of finished product* (6) (a digital story). Some researchers remark from their findings that digital storytelling provide opportunity to *associate teaching and learning with real life* (6). When Table 4.11 below is examined with a lens of skill development, it's seen that digital storytelling measures and also improves various kinds of skills as follows; *researching skills* (1), *co-creativity* (1), *representation skills* (2), *multimodal skills* (2), *problem solving skills* (3), *communication skills* (5), *technical/ICT skills* (mentioned before). Furthermore, there are another findings related to effects of digital storytelling. For instance, it's found to enable *explorative production* (1), *correction of misconceptions* (1), *knowledge organization* (3), extraction of *personal experience* (3), taking *responsibility* (1), obtaining *deep insight of topic* (2), reflecting *cultural identity* (1), improving *learning outcomes and strategies* (1), *sharing* (2) something with others and *active learning* (1). Digital storytelling also found to be *instructive* (1), *easy to use* (5), *practical* (5), *interesting* (3) and *capturing* (5) personalized experience in some research studies. (See Table 4.11 for details).

Table 4.11. *Findings of Digital Storytelling Research Studies*

Themes	**Frequency**	**Publications**
Achievement	23	[21][26][32][33][35][44][45] [46][48][54][56][57][58][60][3] [4][5][7][8][9][12][14][15]
Self- - Self-Control (9) - Self-Confidence (6)	21	[25][27][30][32][33][37][45] [49][56][58][5][9][11] [12][13][19]

- Self-Reflection (4) - Self-Production (1) - Self-Awareness (1)		
Motivation	19	[21][22][26][29][31][32][34][35][36][37][45][48][53][57][58][60][4][7][9]
Technical / ICT Skills	19	[26][27][30][31][32][33][34][35][36][37][40][45][46][49][52][55][56][58][2]
Thinking Skills - Critical Thinking (8) - Creative Thinking (5) - Comprehensive Thinking (1)	14	[26][27][29][32][35][37][49][58][8][16][19]
Entertaining	14	[21][23][26][32][35][37][46][53][56][60][6][11][13][15]
Engagement	14	[26][29][31][32][33][34][36][52][53][55][58][60][9]
Collaboration	13	[21][23][25][29][31][32][34][47][49][53][57][8]
Technology Integration	11	[26][27][29][32][42][45][53][55][56][57][58]
Learning Identity	10	[23][33][45][52][55][56]
Attitude	7	[21][56][57][58][12]
Binding Teaching/learning with Real Life	6	[28][29][31][42][60][15]
Product Quality	6	[26][27][33][45][51][52]
Opinions	5	[27][31][32][36][49]
Anxiety	5	[52][55][56][5]
Communication Skills	5	[31][47][49][17]
Practical	5	[24][25][31][35]
Capturing	5	[25][26][29][31]
Easy to Use	5	[26][29][54][56]
Problem Solving	3	[21][49][17]
Gender Effect	3	[56]
Social Inclusion	3	[10][18][11]
Memory	3	[21][44][46]
Interesting	3	[21][23][26]
Knowledge Organization	3	[21][24][29]
Personalized Experience	3	[26][32][49]
Deep Insight of Topic	2	[31][19]
Literacy Skills	2	[20]
Expectancy	2	[22][25]

Representation Skills	2	[26][40]
Multimodal skills	2	[27][41]
Story Content	2	[31]
Sharing	2	[30][31]
Teacher's Role	1	[36]
Cultural Identity	1	[25]
Learning Outcomes	1	[34]
Online Presence	1	[47]
Learning Strategies	1	[58]
Work Capability	1	[21]
Active Learning	1	[21]
Conflict Resolution	1	[11]
Explorative Production	1	[23]
Encouragement	1	[25]
Reflecting personality	1	[25]
Involvement	1	[29]
Feedback	1	[32]
Taking Responsibility	1	[49]
Researching Skills	1	[58]
Correction of Misconceptions	1	[11]
Commitment	1	[8]
Co-creativity	1	[6]
Valence	1	[5]
Instructive	1	[11]

In order to represent findings of analyzed research studies visually, Figure 4.10 provided below.

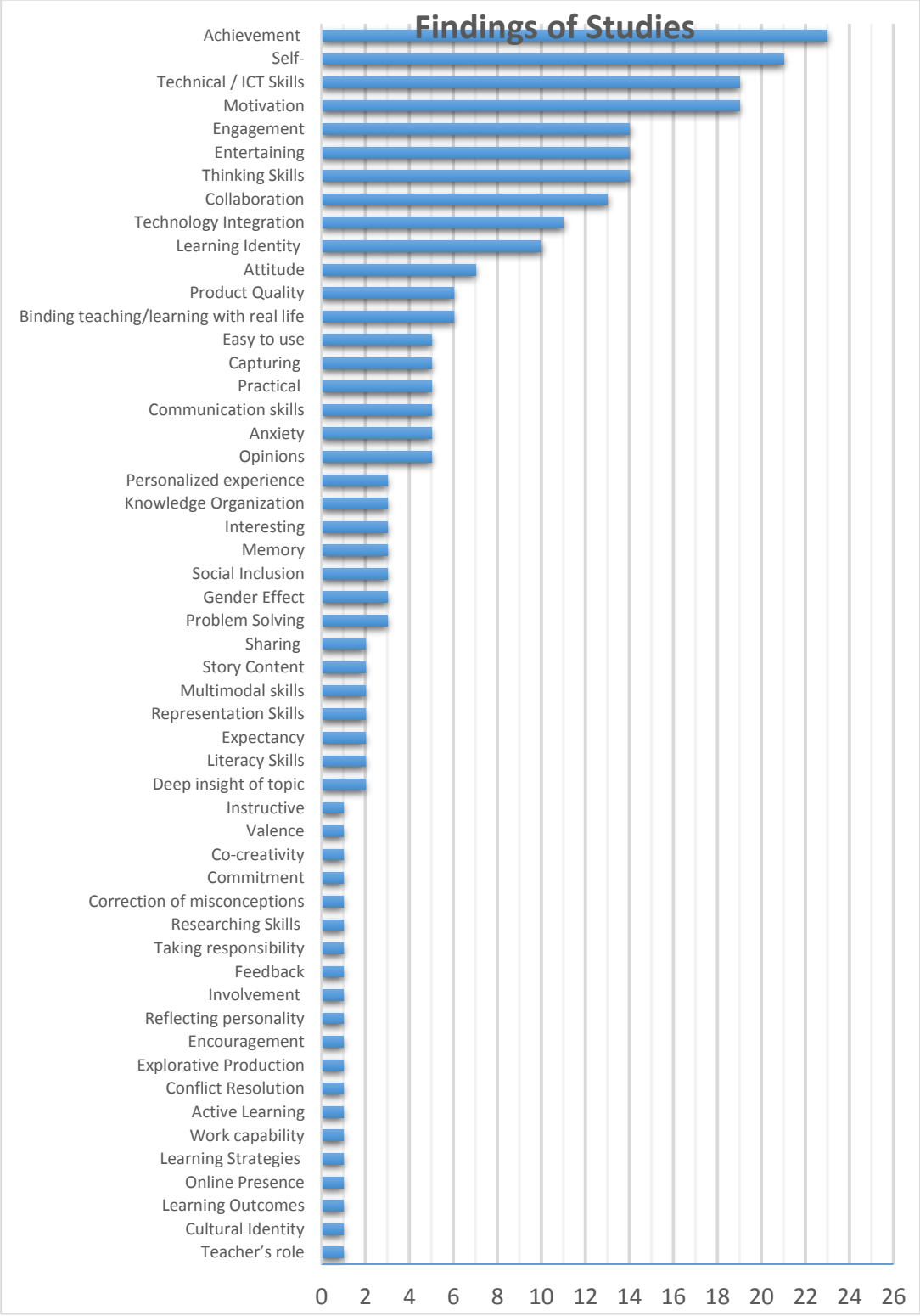

Figure 4.10. Findings of Digital storytelling Research Studies

4.1.10. Suggestions for Further Research

Digital Storytelling studies were also analyzed in terms of future directions or suggestions in the field. At the end of the thematic analysis of further research suggestions three themes were revealed out as suggestions for *participant involvement* ('participants' in Figure 4.11), suggestion for *future digital storytelling implementations* ('DST' in Figure 4.11) and suggestions for *research-based issues* ('research' in Figure 4.11). These three themes are shown in Figure 4.11 below with proportions and each of them were also illustrated in separate graphs (Figures 4.12-4.14).

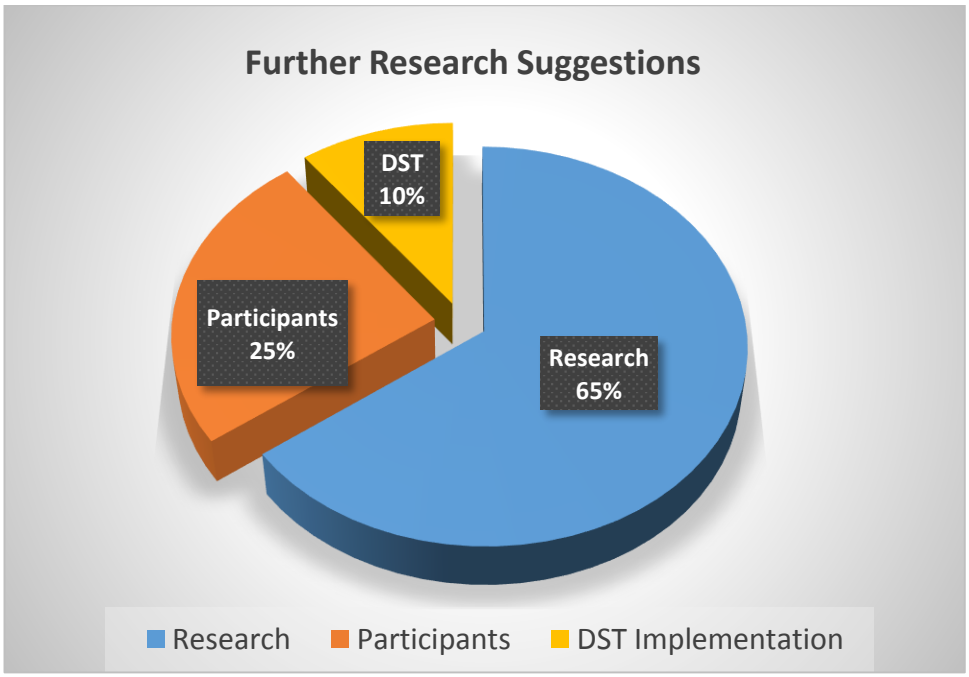

Figure 4.11. Further research suggestions in Digital Storytelling Research Studies

As seen from the Figure 4.11 above, scholars mostly provide suggestions for research-based issues (65%). Furthermore, they also provide some suggestions for participant involvement (25%) and digital storytelling implementation (10%).

Table 4.12 below shows scholars' suggestions for **research-based issues** and these were grouped into three categories or themes as *problems to be investigated* (28), *research methodology* (19) and *context* (16). When Table 4.12 is examined, the most suggested issues are designing a digital storytelling study for *different subject areas* (8), designing long-term (6) and comparative studies (5), implementing digital storytelling in *intercultural context* (3), conducting *experimental studies* (3), investigating *motivation* (3) and *collaborative learning* (3) as a research problem.

Table 4.12. *Research-based Suggestions in Digital Storytelling Research Studies*

Main	**Sub**	**Frequency**	**Publications**
Problems to be Investigated	- Collaborative Learning (3) - Motivation (Intrinsic/Extrinsic) (3) - Investigating Gender Effect/Differences (2) - Language Learning (speaking) (2) - Attitude and Conceptual Changes (2) - Learning Outcomes (2) - Considering Learner Effect (1) - Engagement in Learning (1) - Individual Characteristics of Digital Stories (1) - Social Context of Digital Storytelling (1) - Aural and Oral skills (1) - Visual Reading and Presentation Skills (1) - Story Writing in Digital Environment (1) - Efficiency (1) - Investigating Effects of DST on Difficult Topics (1) - Investigating Peer Interactions (1) - Investigating Reflective Thinking/Learning (1) - Learner Personality/Preference (1) - Investigating the Ways for Increasing Learner Involvement (1) - Language Learning (listening) (1)	28	[42][46][58] [7][11][48] [59] [18][56] [11][58][12] [58][32][33] [20][56][5] [7][16][59]

Research Methodology	- Long-term Studies (6) - Comparative Studies (5) - Experimental Studies (3) - Follow-up Studies (2) - Using both Qualitative and Quantitative measures (2) - Pilot Studies Before Actual Study (1)	19	[4][5][9][12] [52][11][12] [16][19][54] [8][21][52] [32][34] [8][11]
Context	- Implementation for Other Subject Areas (8) - Intercultural Digital Storytelling Studies (3) - Testing Other Digital Storytelling Software (1) - Leisure Time Technology Use (1) - Transferring DST Experience into Traditional Writing (1) - The way of Digital Storytelling Integration (1)	16	[8][10][21] [26][44][57] [58][1][5] [19][21][23] [33][34]

Findings related to research-based suggestions for future digital storytelling studies were also presented in Figure 4.12 below. In the figure, blue bars show contextual suggestions, orange ones show suggestions related to research methodology and green ones show problems that can be investigated in future digital storytelling studies.

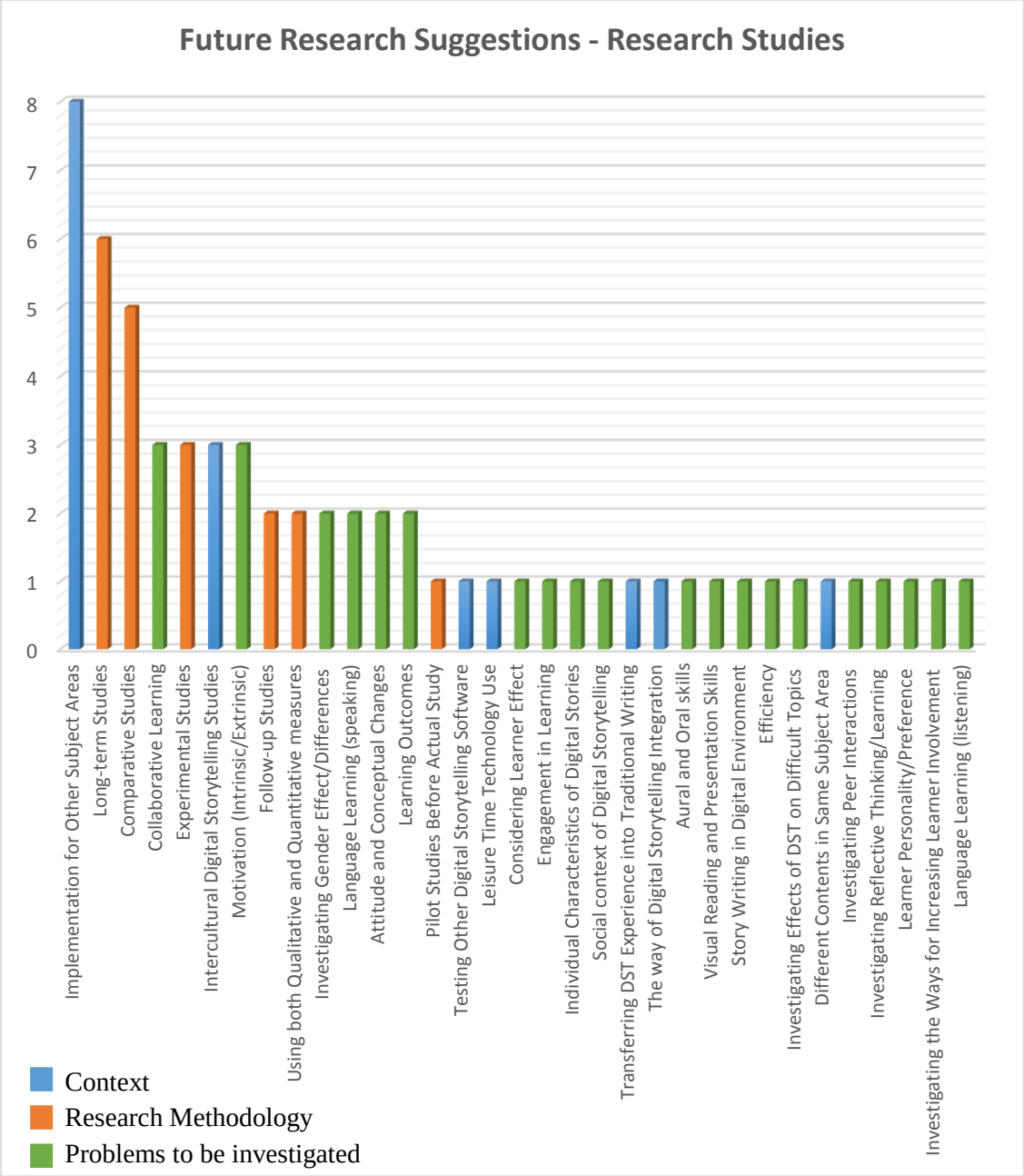

Figure 4.12. Further Research Suggestions in Digital Storytelling Research Studies (Research-based issues)

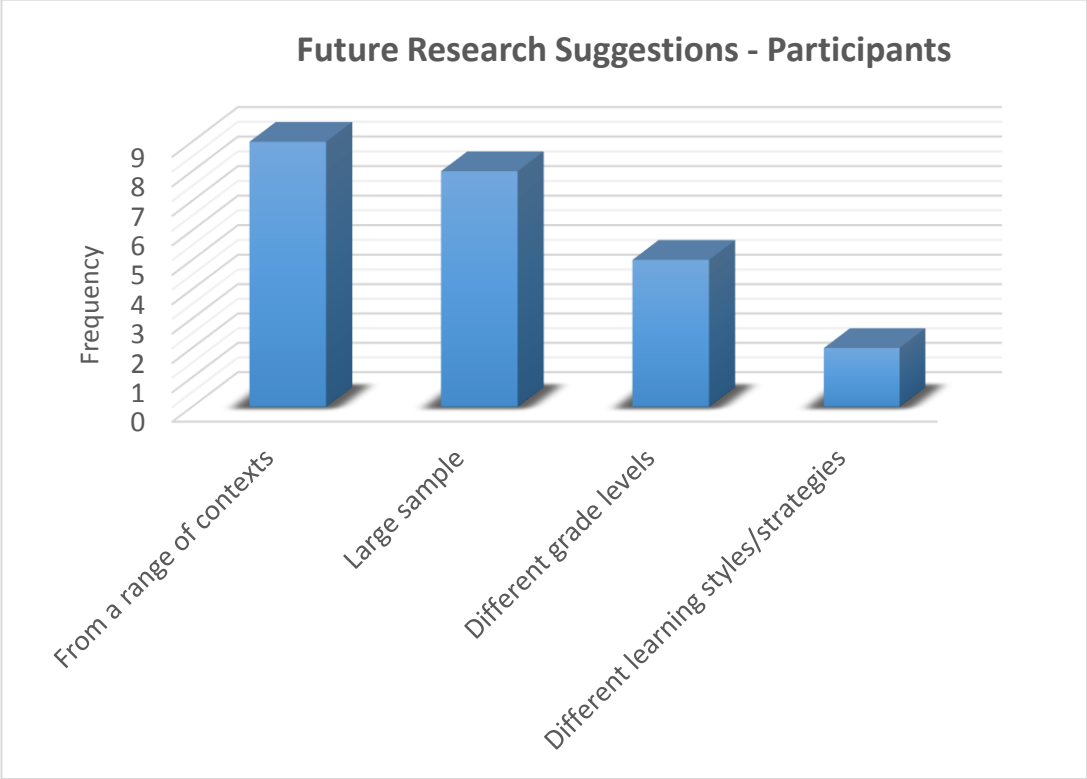

Figure 4.13. Further Research Suggestions in Digital Storytelling Research Studies (Participants)

Figure 4.13 above shows scholars' suggestions for participant involvement in future research studies. The vast majority of scholars suggest to involve participants *from a range of contexts* (9) and involvement of *large sample* of subjects (8). Some researchers suggest include participants from *different grade levels* (5) instead of focusing on same grade level throughout the study. Furthermore, researchers also suggest involvement of subjects having *different learning styles or strategies* (2) to a lesser extent.

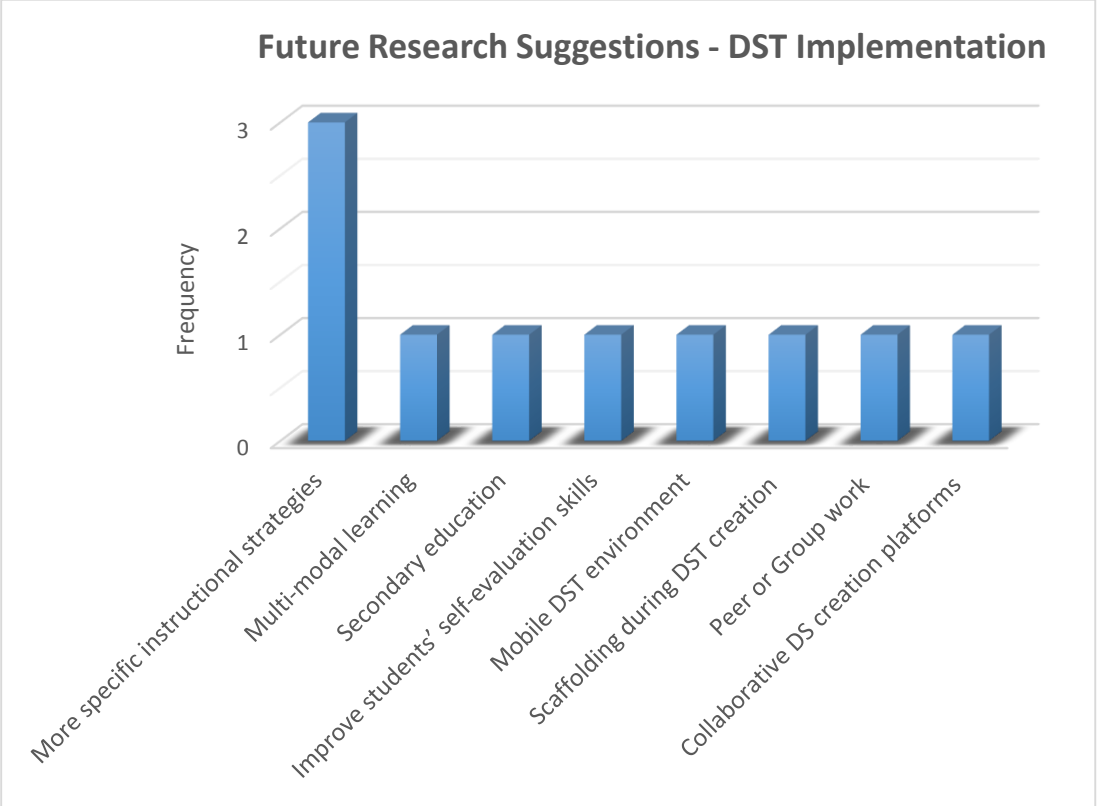

Figure 4.14. Further research suggestions in Digital Storytelling Research Studies in terms of Digital Storytelling Implementation

It's seen from the *Figure 4.14* above that researchers addressed more of an issue of using *specific instructional strategies* (3) while integrating digital storytelling into education. Furthermore, some researchers suggest implementing digital storytelling by focusing on *multi-modal learning* while some of them stress on improving *self-evaluation skills*. In terms of grade level, some scholars put emphasis on implementing digital storytelling activities on *secondary education*. On the other hand, in terms of digital storytelling implementation type, some researchers stress on *peer or group work* as a creation process. In addition, in some digital storytelling research studies, it's remarked that *scaffolding* should be given to learners during digital storytelling creation. Lastly, in terms of digital story creation environments, some researchers

suggest to use *mobile digital storytelling environments* while some of them suggest to integrate *collaborative digital story creation platforms*.

4.2. Experts' Opinions about the kinds of research studies needed in Digital Storytelling

In this section findings obtained from interviewing of field experts were presented in the light of second research question of the study. Within the scope of this research question, findings of expert interviews thematized into 7 categories, namely, definition of digital storytelling, digital storytelling for teaching and learning, advantages and disadvantages of digital storytelling, research agenda for digital storytelling, research paradigm for digital storytelling, theoretical and conceptual bases for digital storytelling, and future expectations of digital storytelling. The findings related with each category are presented under the related headlines below. Furthermore, main findings with the highest frequency were summarized in Table 4.13 below in order to see overall.

Table 4.13. *Summary of the Main Findings from Expert Interviews*

Theme	**Sub-Themes (only top three)**	**Frequency**
Theoretical Framework	Constructivism	22
	Cognitivism	6
	Collaborative Learning	5
Purpose of Studies	Efficiency	7
	Experimental Study	3
	In-depth Investigation	3
Research Questions	Skills	23
	Self-regulation	6
	Experience	5
Research Methodology	Experimental	13
	Mixed Method	10

	Ethnography	8
Subjects	All age group	11
	Pre-School	4
	Grade 5-8	3
Data Collection Methods	Interview	11
	Observation	8
	Achievement Test	6
Subject Areas	Science Courses	20
	Language Education	16
	Social Science Courses	14
Field for Implementation	Every Field	5
	Communication	2
	Health	2
Technological Developments	Provides Opportunities	9
	Lessens Developmental Load	8
	Use of Mobile Technologies	8
Future of Digital Storytelling	Will Become Popular	10
	Not Well-known Enough	7
	Continue to Be Used	6

4.2.1. Definition of Digital Storytelling

Experts in the field of digital storytelling were asked about how they define digital storytelling with their own words. They not only provided pure definition of digital storytelling but also stated some elements of digital storytelling which are constituted sub-themes which are namely *properties of digital storytelling*, *reflecting own voice*, *process of digitalizing the story*, *conceptualizing of digital storytelling*, *facilitator characteristics*, *creation process*, *considerations in story forms*, *problems and limitations*, and *types of a digital story* and presented in Table 4.14 below.

Table 4.14. *Elements of Digital Storytelling*

Themes	**Frequency**
Properties of Digital Storytelling	26
Reflecting Own Voice	21
Process of Digitalizing the Story	18
Conceptualizing of Digital Storytelling	17
Facilitator Characteristics	16
Creation Process	17
Considerations in Story Forms	10
Problems-Limitations	10
Types of a Digital story	5

Experts frequently expressed how digital storytelling should be and statements provided by them in this direction thematized as **properties of digital storytelling (26)**. Under this theme, prominent experts' emphasis are importance of story (8), effect of digitalizing the story (3), prioritizing some elements (3), stimulating emotions (2), co-creativeness (2), around a theme (2), sharing enabler structure (2). They put emphasis on the *importance of story* more than the digital part of the digital storytelling. Some statements stressing on the importance of story are provided below.

> ["Digital part in the definition may not be so important, however; telling a story or providing information in a pattern is very important" (P1)
> "Dijital kısmı çok o kadar belki tanımda önemli değil ama hani hikaye anlatma kısmı bir örüntü içinde bir bilgiyi verme orası çok önemli" (P1)]

> ["…personality in story is in the foreground and it's [DST] a way of telling a story in which story dominates digital" (P2)
> "…kişiselliği ön planda story'nin dijitalden daha ağır bastığı bir öykü anlatım yöntemi" (P2)]

> ["I think it is very important and that is without a good story you're not gonna have a good digital story. So, I think that developing, the selecting the topic and writing the script for what's going to become a digital story

> is probably the most important for step or main component of the digital storytelling process. That will ensure success." (P12)
> "Bence [hikaye] çok önemli ve hikayeniz güzel değilse, dijital hikayeniz de güzel olmayacaktır. Bu yüzden, dijital hikaye olabilmesi için geliştirme, konuyu seçme, metni yazma bana göre belkide dijital hikaye anlatımı sürecinin en önemli adımlarından biri. Bu başarıyı sağlayacaktır." (P12)]

Experts were also remarked *the effectiveness of digitalizing* related to properties of digital storytelling. By digitalizing the story, creators of digital story may increase visual richness and make digital stories possible to be used over and over.

> ["…If you do this [Storytelling] with the help of digital tools, it can be more effective. Reusability is too high. In addition, visual richness is too high if it [story] is turned into a digital story form" (P1)
> "…birde bunu [Hikayelendirme] dijital araçlar yardımıyla yaparsan çok daha effective olabiliyor. Tekrar tekrar kullanılabilirliği çok yüksek oluyor. Birde görsel zenginliği çok fazla oluyor dijital hikayeler haline getirildiğinde." (P1)]

According to one expert, digital stories should *prioritize or put forward some elements* as; voice, narrative and solidarity while they were created.

> ["…I understand it [Digital Storytelling] as a structure which prioritize voice, narrative and solidarity and organize them with digital forms in order to be shared"(P4)
> "…sesi, anlatıyı, dayanışmayı öncelleyen ve bunu dijital formlarla düzenleyip paylaşan bir yapıyı [Dijital Hikaye Anlatımı] anlıyorum" (P4)]

Furthermore, experts believe that digital storytelling should *stimulate emotions* of both creators and audiences and also should be a *co-creative* process. Within the scope of properties that digital storytelling should possess, some experts state that digital stories should be created *around a specific theme* and have the structure of being open to be shared online or in other words *sharing enabler structure*. Although the importance of story itself rather than digitalizing part was emphasized generally, *the importance of technology* was also reported as follows;

> ["…the technology is important because if you can't see it well or you can't hear what the person is saying then that can be a very significant impediment to success of the story." (P12)

> "… teknoloji de önemli çünkü eğer iyi göremezseniz veya kişinin ne söylediğini duyamazsanız, bu hikayenin başarılı olabilmesine en büyük engel olur" (P12)]

According to field experts, digital stories should also be associated with something to be remembered by audiences or in other words *enabling association for remembering*. In addition, digital story should be *unique* to person who create it. Like the importance of the story, *story circle* is also important for digital storytelling through which stories are started to be created and people express themselves as stated below;

> ["I mean, story circle is the most important phase of digital storytelling workshop. Because, in this phase stories are started to show up and people express themselves through this phase" (P3)
> "Yani hikaye çemberi bu dijital hikaye atölyesinin bence en önemli aşamalarından biri. Çünkü, burda hikayenin ortaya çıkmaya başladığı, kişinin kendisini ifade ettiği aşama" (P3)]

Secondly more mentioned issue with respect to definition of digital storytelling was **reflecting own voice (21)** through creation of a digital story. Under this theme experts emphasized reflecting emotions (4), telling real life experience (4), self-expression (3), personal narratives (3), students' own voice (3), reflecting ideas (2) and self-selected visuals (2). Within the scope of reflecting own voice theme, some experts mentioned *reflecting emotions and ideas* during the process of a digital storytelling as follows;

> ["According to me, voiceover session by reflecting emotions is one of the most important points. Because, providing voiceover with your emotions and reflecting your real life have great impact" (P10)
> "Bana göre en önemli noktalardan bir tanesi gerçekten duygularını da yansıtarak seslendirebilmek olayı. Çünkü oradaki senin duygularınla birlikte o seslendirmeyi verebilmenin etkisi yüksek, yaşantını gerçekten oraya aktarabilmek. Onu önemli olarak görüyorum." (P10)]

Digital storytelling is expressed by some experts as the process shaped by *telling real life experiences* and lived events with people's own words or *self expression, personal narratives* and *voices.*

> ["... it's [Digital Storytelling] defined as creating and telling a story from lived events, experiences, peoples' own life and a slice of life." (P8)

> "...yaşanan olaylardan, deneyimlerden, tecrübelerden kişilerin kendi hayatlarından, kesitlerinden hikayeler oluşturması ve bunu anlatması şeklinde tanımlanıyor [Dijital Hikaye Anlatımı]." (P8)]
>
> ["I can define it [Digital Storytelling] as people's expressing themselves in some way or their self-reflecting" (P7)
> "...kendini bir nevi ifade etme biçimi ya da insanın kendini yansıtması olarak tanımlayabilirim" (P7)]

Using *self-selected materials* during digital storytelling process was also reported as;

> ["… I defined it [Digital Storytelling] as a process of creating a digital form with the support of self-selected or self-created visuals." (P13)
> "…kendi seçtikleri ya da oluşturdukları görsellerle destekledikleri dijital bir form yaratma süreci olarak tanımlıyorum ben." (P13)]

Thirdly, digital storytelling was expressed by some experts as a **process of digitalizing the story**. In other words, they stated that they comprehend digital storytelling as enhancing stories with technology by using multi-media tools and keep final product, a digital story, in a computer or in a web-page. Some remarkable statements provided below;

> ["I understand it [Digital Storytelling] as telling a story in a different way using a technological tools or integrating technology" (P2)
> "Hikayenin bir teknolojik araç kullanılarak ona entegre edilerek farklı bir şekilde ifade edilmesi şeklinde anlayabiliyorum." (P2)]
>
> ["Digital story is a process of transferring a text of story by using multi-media elements such as visuals, musics, sound effects. Certainly, it is up to people. They can keep them in computer environment, or if they want they can keep and share it in a web-page through a blog or a channel" (P6)
> "Dijital hikaye çoklu ortamların yani resim, müzik, ses efektleri ve bir hikaye metninin çoklu ortamlarla bilgisayar ortamına aktarılması. Tabii bu kişinin kendisine kalmış bir şey. Bunun gerek bilgisayar ortamında tutabilir, gerekirse de web sayfasında bir blog ya da bir kanal aracılığıyla da paylaşabilir" (P6)]
>
> ["I can define it [DST] as digitalizing, in other words, enhancing current storytelling process with digital materials" (P8)

"...dijitalleştirme yani mevcut hikaye anlatımının ya da öyküleme, öykü anlatımının dijital materyallerle zenginleştirilmesi olarak tanımlayabilirim." (P8)]

["The digital storytelling is the combination of traditional storytelling with digital tools. So, it's the creation of usually short stories that are created on a computer using a variety of artifacts effects that include images, text, audio narration, music and sometimes video clips" (P12)
"Dijital hikaye anlatımı geleneksel hikaye anlatımı ile dijital araçların birleştirilmesidir. Yani, dijital hikaye anlatımı bilgisayar ortamında resim, metin, sesli anlatım, müzik ve video klipleri içeren çeşitli unsurların kullanılarak kısa hikayeler üretme sürecidir." (P12)]

While defining digital storytelling, participants (DST field experts) provide some statements about the process of a creation of digital story or digital storytelling itself. All of these statements were grouped under the theme **conceptualizing of Digital storytelling (17)**. Under this theme, experts emphasized digital storytelling as a process (6), aesthetical form of writing (4), its being not an approach (3), combination of visuals and audio (2), and creation of short story (1). In this regard, some of them expressed digital storytelling as a *creation of a short* story while some others expressed it differently by stating that it's an *aesthetical form of writing* with current technologies as provided below;

["It's the creation of usually short stories" (P12)
"Dijital hikaye anlatımı genellikle kısa hikayeler oluşturmadır" (P12)]

["I mean it's [DST] rephrasing of writing in an aesthetical form by using tools [technologies] of the time, however, I can state here that expressing words in an aesthetical way is quite important" (P9)
"Yani estetik bir formda yazının çağın araçları ile yeniden ifade edilmesi [DHA] ama burada tabi sözün estetik bir şekilde ifade edilişi oldukça önemli diye ifade edebilirim." (P9)]

Furthermore, some experts remarked that digital storytelling should not be interpreted as an *approach* or a tool, *it is a process* through which *visual and audial expressions are combined* with the help of specific technologies.

["I mean, I define digital storytelling as a process, where created final material [product] is a digital story itself but when we say digital storytelling, this process should be expressed [underlined]. Because it's a process-based thing starts from a creation of a story and ends with

digitalizing and even sharing it [story]. This [DST] is not a tool. This is a process" (P11)
"Yani bir süreç olarak tanımlıyorum ben hikaye anlatımını, hani bir oluşan son materyal dijital öykünün kendisi oluyor ama dijital öyküleme dediğimiz zaman hani o sürecin aslında ifade edilmesi gerekiyor. Çünkü o bir süreç işi hani öykünün oluşturulması aşamasından başlayıp hani en son onun dijitalleştirilmesi ve hatta paylaşılması ile son bulan…. Bu [DHA] bir araç değil. Bu bir süreç." (P11)]

Experts mentioned how implementer of digital storytelling should be from beginning of the story creation to end of the creation process. All of the statements regarding this were collected under the theme of **facilitator characteristics (16)**. Implementers whether they are educators or not are defined as a facilitator since their fundamental duty is to guide and help learners (or creator of a digital story) during the whole process. Most stated to least stated main issues that experts put into words regarding to characteristics of facilitators are as follows; (1) make people externalize their narratives by encouraging them, (2) understand philosophical background and theoretical base of the process, (3) consider student properties and class context, (4) give more importance to experience rather than topic selection, (5) have a clear mind and be ready for every condition during the whole process, (6) be absolutely a guide for learners rather than a person giving order to them. Some statements regarding to these issues were provided below;

["Telling them [learners or creators of DST] being listened by someone is actually important and a part of whole process. Because, everyone needs to tell. Everyone needs to be listened and heard by others absolutely…you actually serve for mediaton to something while listening to them. Indeed, you provide them to externalize their narratives." (P13)
"Onlara birinin dinlemesinin aslında önemli olduğunu anlatmakta işin bir kısmı. Çünkü herkesin anlatmaya ihtiyacı var. Herkesin dinlenmeye ve duyulmaya ihtiyacı var çok net olarak…senin onları dinliyor olman aslında bir şeye aracılık ediyorsun. Onların anlatılarının aslında dışarı çıkmasını sağlıyorsun." (P13)]

["I think, one of the most important points to consider during implementation of a digital storytelling process practically or for research is properties of students and context, I mean class context." (P11)

> "Dijital hikayeleme sürecini uygularken pratik anlamda ya da araştırırken en çok dikkat edilmesi gereken şeylerden birinin öğrenci özellikleri ve context olduğunu düşünüyorum yani sınıfın durumu." (P11)]
>
> ["…not intervene students during the process, instructors should be on the side of guiding from placing visuals to voiceover session because consider that they align visuals according to order in their mind" (P9)
> "...süreç içerisinde öğrenciye müdahale edilmemesi, öğretmen sadece yönlendirici boyutta kalması, yani görselle, görselleri yerleştirmeden seslendirmeye varıncaya kadar çünkü orda bakın dikkat edin görselleri kendi sırasına göre diziyor" (P9)]

Participants also provided some clues or requirements about the **creation process (17)** of a digital story. These were grouped into three main topics as (a) procedural considerations (9), (b) group work (4) and (c) sharing stories (1). With respect to *procedural considerations*, experts claimed that students should follow certain steps or phases defined in related literature respectively during a creation of digital story, however, if it's required to do that they can flexibly transit among steps, for instance updating a story or changing the visuals. Regarding to following certain steps during the process, it's also stated that storyboarding phase can be omitted for some learner especially younger ones since it takes too much time for them and they already do this on the phase of digitalizing a story. Besides of following certain steps, self-management of digital story creation process was also emphasized by some experts. For the creation of a digital story as a *group work*, experts claim that co-creativeness among developers of digital story should be taken into consideration by implementers. This can be done through guiding them to cooperate on each phase of creation, to decide visuals together and advise themselves. Furthermore, it's also remarked that making learners interacting with themselves is so important during a creation process. This interaction should be kept as far as possible from the beginning of a creation process in which story is started to be written to sharing finished product by presenting it to audience. The last thing reminded by the field experts with respect to creation process is to *share stories* through circulating narratives among learners. Experts who brought out this idea believe that each learner needs to tell a story and share it with

peers and as a result of sharing their stories they can learn from each other and emotionally evoked.

Statements provided by experts regarding to story forms were grouped into **considerations of story forms (10)** and major points are as follows; telling a story in a *contextual* way to improve remembering (3), placing it into a *pattern* (3), telling a story in a *meaningful sequence* (1) and *binding it with a real life* (1). Field experts provided some **problems and limitations (10)** with respect to digital storytelling. One of the problems stated by them is the *concept conflict* of digital story (3). They believe that some people are mistaken about the use of a digital story such that short films or every digitalized videos by even using PowerPoint slides are perceived as a digital story. Some experts expressed this perception as so *wrong* and believe that in order something to be a digital story, it requires some steps to be followed by creators and created within the framework of some rules. One of the experts provided a statement about this issue as below;

> ["I'm also seeing that they are more what I called negative examples of digital storytelling so if you go on the YouTube for example and you do a search for digital story on that term than you will find a lot of videos that have digital story in the title but they're not really digital stories. They're either music videos, or they can be advertisements or they can be all kinds of things, that are saying they are digital stories because they say they are doesn't mean that they really are...You know a lot of people do PowerPoint presentations and PowerPoint allows you to save your presentation as a video so and add narration to your files. So, some people create PowerPoint presentations and they say it's a movie and they call it as a digital story... TedTalks are another example. It is digital and the person is telling a story but by my definition I don't always think that's a good example of a digital story." (P12)
>
> "Şunu da görüyorum ki internette örneğin YouTube'da dijital hikaye anlatımının negative örnekleri olarak nitelendirebileceğim bir çok video var. Dijital hikaye terimi ile arama yaptığınızda başlıkta dijital hikaye olan fakat aslında dijital hikaye olmayan bir çok video bulmak mümkün. Bu videolar müzik videosu veya reklam ve hatta her konuda olabiliyor. Tüm bu videolara dijital hikayenin gerçeğini yansıtmadığından dijital hikaye diyemeyiz. Biliyorsunuz ki bir çok insan PowerPoint sunuları hazırlamakta ve PowerPoint size sunularınızı anlatılarda ekleyerek video formatında kaydetme seçeneği sunmaktadır. Bu yüzden, bazı insanlar PowerPoint sunuları oluşturmakta ve bunları video olarak nitelenidirip

dijital hikaye olarak adlandırmaktadır. TedTalks da bir diğer örnek, onlar da dijital ve bir kişi tarafından hikaye anlatılıyor ama benim tanımıma göre dijital hikayenin iyi bir örneği değil" (P12)]

Another problem for the use of digital storytelling is *limiting learners to select a topic* from a provided topic lists. For this issue, it's stated that learners' creativity is restricted as provided below;

["When there is a limitation for topic selection, I think creativity of student is a bit restricted." (P3)
"Belirli bir konu sınırlaması getirildiği zaman öğrencinin birazcık bence yaratıcılığı darlıyoruz. Diye düşünüyorum." (P3)]

For the *limitation of digital storytelling*, it was stated that it does not fit to all subjects areas especially for hard science as follows;

["...digital storytelling is not so much not as good a tool I don't think for teaching mathematics or sciences or some other, some content areas where the story aspect does not, does not fit as well... Pythagorean Theorem that kinds of things related to math and sciences but the storytelling aspect doesn't work so well if you try to teach people you know about you know, the real hard sciences, content from the hard sciences." (P12)
"…dijital hikaye anlatımı bence matematik veya bilim ya da hikaye yönünün tam oturamayacağı alanlarda iyi bir araç değil. Pisagor teoremi gibi matematik ve bilimle alakalı konularda bildiğinizi öğretmeye çalıştığınızda hikaye anlatımı pek uygun bir yötem olamayabilir" (P12)]

The last thing that should be reported here related to definition of digital storytelling provided by field experts is **types of a digital story (5)** which are stated as (1) *historical stories* which handles historical events and phenomena, (2) *instructional stories* for the purpose of teaching and learning and (3) *personal stories* telling personal experiences.

4.2.2. Digital Storytelling for Teaching and Learning

Participants who are the experts in the field of digital storytelling were posed some questions regarding to areas and grade levels that are the best for implementation of digital storytelling in teaching and learning by providing them meta-synthesis findings related to these issues. Furthermore, participants were also asked about what kind of

an approach digital storytelling is in terms of teaching and learning and how can it be integrated in education. Findings obtained from the thematic analysis of given responses to these questions were presented here by grouping into four main topics as follows; (1) Gains from the Use of Digital Storytelling in Education, (2) Integration Considerations (3) Subject Areas for Implementation and (4) Optimal Target Group for Implementation.

4.2.2.1. Gains from the Use of Digital Storytelling in Education

Experts in the field of digital storytelling were asked about what kind of an approach digital storytelling is in terms of teaching and learning. From the responses of the experts, namely *benefits*, *promotes learning*, *sharing knowledge*, *ameliorates teaching*, *evaluation purpose*, and *promotes engagement* themes were emerged and provided in Table 4.15 below. Detailed explanations for each theme were provided in the following section respectively.

Table 4.15. *Teaching and Learning Considerations*

Themes	**Frequency**
Benefits	58
Promotes Learning	19
Sharing Knowledge	4
Ameliorates Teaching	4
Evaluation Purpose	3
Promotes Engagement	2

Participants mentioned some **benefits (58)** of digital storytelling in teaching and learning and these aspects were reported here with subthemes by providing some remarkable direct quotations. Under this theme, experts emphasized reflecting own voice (21), product creation (15), enhance social structure of learning environment (12), cognitive development (5), facilitating knowledge and skill development (3). One

of the significant benefits of digital storytelling is its enabler structure for *reflecting voice* of learners. The structure of digital storytelling make learners reflect their own voice by providing a free environment through which they can express themselves, convey their real life experiences, share their own personal stories and make decisions independently. Some remarkable statements for this theme reported below;

> ["We can handle digital storytelling as a tool for easing self-expression… It's a process or a formation through which people are able to release their voice, tell their own stories and share them and as a result of this sharing others involve in the process by saying that I have a story to tell too " (P4)
> "…kendini ifade etmeyi kolaylaştırabilecek bir tool olarak ele alabiliriz dijital hikaye anlatımını…kişinin kendi sesini duyurabilmesi, kendi hikayesini anlatabilmesi bunu paylaşması, paylaşması sonucunda diğerinin de benim hikayem var diyerek ortaya girmesini sağlayan bir süreç bir oluşum" (P4)]

> ["All tools are provided to learners' use and learners' thoughts are not inhibited in education since it [DST] enables them to re-express themselves in the form they want. Digital stories fundamentally make learners to take action freely and [express] their emotions and ideas...students use every images, tones, background musics which they want and express every voice they want in a form they chose. Within this scope, it's quite important that it [DST] provide students freeness of thoughts" (P9)
> "…bütün araçlar öğrencinin eline veriliyor ve istediği formda kendini yeniden ifade etmesi sağlandığı için eğitimde öğrencinin düşüncelerine ket vurmuyor... dijital hikayeler öğrencinin en temelde serbest hareket etmesini ve kendi duygu ve düşüncelerini [aktarmasını sağlıyor]...istediği resmi kullanıyor, istediği sesi istediği formda ifade edebiliyor, ya da istediği tınıları kullanabiliyor, istediği fon müziğini kullanabiliyor. Bu bağlamda öğrenciye kendi düşünce serbestliğini vermesi açısından oldukça önemli." (P9)]

Another benefit of digital storytelling reported by experts is *creation of a unique product* which evokes students' sense of ownership by combining their own emotions and ideas. Furthermore, it's also reported that digital storytelling should not be interpreted as a product based approach instead it should be considered as a whole process through which learners tell their real life experiences by being productive.

["At the end of the process a product can be revealed and throughout this process since students experience this process or go on with a subject or an instructional process at the same time, they can learn something anyway." (P2)
"En sonunda sürecin sonunda bir ürün olarak ortaya çıkarılabilir ve bu süreçte hani o süreci öğrenci yaşayacağı için, konuyla ya da o eğitim öğretim süreciyle birlikte gideceği için o anlamda da zaten öğrenebilir." (P2)]

["For instance, students might be demanded to reveal products around some topics, themes or lesson objectives" (P8)
"Mesela belirli kazanımlar etrafında ya da belirli temalar etrafında öğrencilere bununla, bu konularla ilgili mesela zaman zaman ürünler ortaya konulabilir, öğrencilerden bu ürünleri ortaya koymaları istenebilir." (P8)]

["People can tell a story that is quite relevant to real life. Students obviously find something from their life or find something from others' lives they know" (P1)
"Çok gerçek hayatla ilişkili anlatıyorsun. Öğrenci mutlaka kendi hayatından bir şeyde buluyor ya da tanıdığı bildiği hayatlardan bir şey buluyor." (P1)]

Experts claimed that digital storytelling *enhance social structure of learning environment* by increasing participation of students, improving communication skills of learners and socializing them.

["It [DST] provides active participation of a student since it takes reaction rather than being passive" (P1)
"Öğrencinin pasif olmasından çok öğrenciden reaksiyonda aldığı için öğrencinin aktif katılımını da sağlayan bir şey." (P1)]

["During the process, in order to create a story, students require create or find visuals. Then, they need to digitalize their story with their voices and found visuals. This process is completely a process in which students take an active role" (P11)
"O süreç içerisinde oluşturduğu öykü işte görseller oluşturmasıydı, görseller bulması gerekiyor. Daha sonrada kendi sesleriyle ve buldukları görsellerle onu dijitalleştirmesi gerekiyor. Bu süreç tamamen öğrencinin kendisinin aktif olduğu bir süreç" (P11)]

According to experts digital storytelling provides benefit of *cognitive development* by increasing self-awareness, enabling learning transfer, promoting creativity and using

mind actively. Beside of cognitive development, digital storytelling *facilitates knowledge and skill development* such as 21st century skills, occupational skills and technological skills.

> ["… I think that it [DST] contributes students to transfer principal knowledge or transfer their learned information" (P8)
> "… öğrencilere asıl bilgiyi transfer etmesi ya da öğrendiklerini transfer etmesine de katkı sağlayabilir diye düşünüyorum" (P8)]

> ["I can say that it's [DST] quite original in the context of creativity. Because, we as a teacher, usually want students to be in a form which we want as we have a traditional mind." (P9)
> "Özellikle yaratıcılık bağlamında oldukça orijinal diyebilirim. Çünkü biz öğretmenler genellikle öyle bir geleneksel yapıdan da geldiğimiz için hep öğrenciyi istediğimiz formda olsun istiyoruz." (P9)]

> ["I interpret it [DST] as a process through which learners reveal a product of themselves and during this revealing process of a product, they learn some skills especially 21st century skills and later on they turn these skills into practice and use for creating a unique products and to share knowledge" (P8)
> "Bireylerin, kendilerinin ortaya bir ürün koyması süreci olarak ben değerlendiriyorum ve bu ürünü ortaya koyarken de hem bir takım becerileri özellikle 21. Yüzyıl becerileri denilen becerileri öğrenildiği bu becerilerin daha sonrasında uygulamaya dönüşüp kullanıldığı özgün ürünlerin ortaya konularak bilginin paylaşıldığı bir süreç olarak değerlendirebilirim" (P8)]

Experts stated that digital storytelling can be considered as **promoting learning (19)** in terms of learning and instruction by providing environment in which students learn something contextually or learning by doing, use their knowledge or retention of learning and transfer their learnings.

> ["I can say that revealed materials [finished products] have an instructive quality…from teaching perspective, it's [DST] is a contributing process I think. If we look at from a learning perspective, students learn by doing, living and combining their inner feelings and thoughts, they create a material through which both they and audience can learn something I think." (P8)
> "Ortaya çıkan materyallerinde öğretici bir niteliği olduğunu söyleyebilirim…öğretme açısından katkı sağlayıcı bir süreç olarak

düşünüyorum ben, değerlendiriyorum. Öğrenme açısından baktığımızda da dediğim gibi öğrencilerin yaparak yaşayarak [eee] kendi içerisindeki, iç dünyalarındaki duygu ve düşüncelerini de bir araya getirerek [ee] öğrenme, hem kendilerinin öğrendikleri hem de izleyicilerin öğrenebileceği bir materyal ortaya koyduklarını düşünüyorum." (P8)]

["I believe it [DST] as a learning process because we actually learn something from every narratives [stories] and throughout digital storytelling workshops people learn something about both themselves and lives of people who attend in workshop" (P13)
"Öğrenme süreci olduğuna inanıyorum çünkü her bir anlatıyla aslında bir şey öğreniriz biz ve dijital hikaye anlatımı atölyelerinde de insan hem kendiyle ilgili bir şey öğrenir hem de atölyeye katılanların yaşantılarıyla ilgili, deneyimleriyle ilgili bir şeyler öğrenir" (P13)]

["By involving students in this process, even if student creates these stories, this is exactly learning by doing" (P1)
"Öğrenciyi katarak işin içine, hele birde öğrenci geliştiriyorsa bu hikayeleri yani bu tam yaparak öğrenme oluyor." (P1)
"Especially while teaching science and telling inventions of genius people in science, if contextual telling were used, retention and recalling rate is too high I think. Instead of telling $e=mc^2$, telling the life story of Einstein and telling that he didn't get a Nobel prize for $e=mc^2$ but he won that prize for his published work about electromagnetic fields in a scientific journal at 1905 and explaining with what motivation he accomplished this work in a story form, believe me students' recalling rate is too high" (P1)
"Özellikle bilim anlatılırken o bilimdeki büyük adamların büyük buluşların hikayeleri o context içinde anlatılsa çocukta kalıcılığı ve geri getirilme oranı çok yüksek olur bence. Hani, $e=mc^2$ değilde mesela Einstein'ın hayatını veripte, aslında işte Nobel'i e=mc2 ile almadığını ama 1905 yılında işte […] dergisinde bastığı elektromanyetik alanlarla aldığı anlatısını, bunu ne motivasyonla yaptığı anlatılsa ya bu bir hikaye içinde anlatılsa inan daha çok dönüşü olur" (P1)]

Digital storytelling can be used for **knowledge sharing (4)** among peers and instructors. According to some experts, digital story creation process enable students to *share their knowledge* with other students and educators and thus they can *learn from each other* by *making sense of others' digital story*. Beside of sharing information, digital storytelling can be used as an instructional tool for **ameliorating teaching (4)** by providing an environment in which students make discussions about educational topics. On the other hand, its **evolutionary use (3)** was also remarked by

some experts such that students may be asked how should story end up after instructor developed digital story were shown. Digital storytelling is used for **promoting engagement (2)** according to some experts whom statements provided below;

> ["…I think, it's [DST] effective for increasing students' engagement and attitude toward lesson" (P2)
> "…derse karşı olan tutumunu ilgisini arttırma kısmında etkili olduğunu düşünüyorum" (P2)]
>
> ["It's a way to engage learners especially young people" (P12)
> "Öğrenenlerin özellikle küçük yaş grubunun ilgisini çekmek için bir yöntem" (P12)]

4.2.2.2. Integration Considerations

Field experts were also asked a question of how digital storytelling can be integrated into learning and instruction. Responses to this question were thematically analyzed and organized into 4 themes namely, *suggestions for integration*, *determinants of integration*, *goals for integration*, and *interpretation of integration process* which were provided in Table 4.16 below.

Table 4.16. *Issues for Integration*

Themes	**Frequency**
Suggestions for Integration	62
Determinants of Integration	32
Goals for Integration	32
Types of Digital Storytelling Use	6
Interpretation of Integration Process	5

Field experts provided some **suggestions for integration (62)** of digital storytelling into education. Within this scope they provided suggestions about subject-related issues (20), the way of digital storytelling integration (9), lesson phase choice for digital storytelling integration (8), in-service training (8), focus point of digital

storytelling implication (6). Among *subject-related suggestions*, the most prominent one is its applicability to all subject areas. They believe that digital storytelling should not be restricted with language education and it should be applied on other subject areas. Some remarkable statements were provided below;

> ["I think, digital storytelling should not be limited to language education, it is quite possible to use digital storytelling in other subject areas, out of education and even in other institutions" (P6)
> "Yani bence dijital hikaye anlatımı sadece dil öğretimiyle sınırlı kalmamalı bunun diğer disiplinlerde eğitim dışında hatta diğer alanlarda diğer kurumlarda da çok rahatlıkla kullanılması mümkün" (P6)]

> ["Its [DST] use in only language education is limiting. I think, it can be used and worked on several areas since it's a versatile approach" (P8)
> "Sadece dil eğitimi alanında çalışılması sınırlayıcı olur. Birçok alanda ben bunun çalışılabileceğini ve kullanılabileceğini çünkü zaten hani çok yönlü bir yaklaşım." (P8)]

> ["Story is in all aspects and phases of human life. Even you grow a child, you use stories. This is true. So, why we restrict it by saying it can be used in these areas and not be used in those areas? (P11)
> "Hikâye insan yaşamının her alanında var. Her aşamasında var. Çocuk yetiştirirken bile hikâyelerle yetiştiriyorsunuz. Yani bu bir gerçek. O zaman niye biz bunu şu alanda kullanılabilir, bu alanda kullanılamaz diye kısıtlayalım ki? (P11)]

> ["I believe that it can be integrated into many different subject areas primarily the humanities more courses and programs that deal with history, culture, music, language, geography perhaps, and last in areas like and also in medicine" (P12)
> "Ben tarih, kültür, müzik, dil, coğrafya gibi bir çok farklı konu alanina entegre edilebileceğine inanıyorum." (P12)]

It's also claimed by experts that digital storytelling can be used with an interdisciplinary approach rather than using it in only one discipline.

> ["…I think, it [DST] can be used easily in interdisciplinary studies. I think that students not only work on only one subject but also they can work on several subjects easily" (P6)
> "…disiplinler arası çalışmalarda çok rahatlıkla kullanılabileceğini düşünüyorum ben bunun [DHA]. Öğrenciler hani sadece bir alanda

çalışma yapmak değil, birkaç alanda rahatlıkla çalışma yapabileceklerini de düşünüyorum" (P6)]

["…when we think its [DST] use in interdisciplinary approach, it can provide so many benefits I think. Its use in interdisciplinary approach is important in terms of combining objectives of different subject areas and revealing a different product with digital materials by using technology, I think." (P8)
"…disiplinler arası bir yaklaşım içinde kullanılabileceğini düşündüğümüzde birçok katkı sağlayabilir, diye düşünüyorum. Disiplinler arası bir yaklaşım içerisinde de bu farklı derslerdeki belki kazanımları birleştirerek ortaya dijital materyallerle, teknolojiyi de kullanarak farklı bir ürün ortaya koyması açısından önemli diye düşünüyorum" (P8)]

Furthermore, it's also stated that everything should not be turn into story form. Rather, more complex topics should be told in stories as;

["I'm opponent of turning everything into a story form forcefully. Because, in this way some basic things are turned into a story. The important thing for storytelling is to tell more complex and comprehensive contents. It's meaningless to put things compromised of too basic facts or truths into a digital story" (P1)

"Ben her şeyin çok zorlama hikayeleştirilmesine de karşıyım. Çünkü bazı basit şeyler hikayeleştiriliyor. Hikayeleştirmede önemli olan daha kapsamlı ve complex içerikleri verebilmek. Çok basit fact'lerden ya da gerçeklerden oluşan şeyleri de bir dijital hikayenin içine koymak çok anlamlı değil" (P1)]

Experts provided *the ways of digital storytelling integration* into education as showing prepared digital stories, students create digital stories, and instructor develops digital stories. Among these three ways, they mostly prefer second one which is digital stories created by students and justification for this provided below with a statement of one field expert;

["My preferred method is to have students create their own digital stories I think that's much more effective as a way to get students involved in conducting research on a particular topic and then creating all the components of the digital stories and putting it all together and sharing it with other students in classroom and then facilitating discussion either within the classroom or sometimes beyond the classroom if the digital

stories posted online another people invited in to comment about it." (P12)

"Benim tercih ettiğim yöntem öğrencilerin kendi dijital hikayelerini oluşturması. Bence bu, öğrencilerin belirli bir konuda araştırma yapması ve daha sonra dijital hikayenin tüm bileşenlerini oluşturması, bir araya getirmesi, diğer öğrencilerle sınıf ortamında paylaşması, ve daha sonra sınıf içinde veya sınıf dışında dijital hikayelerin çevrimiçi paylaşılması ve diğer kişilerin bu hikayelere yorum yapmasıyla tartışma imkanı bulmaları adına çok etkili bir yöntem." (P12)]

From *lesson phase choice for digital storytelling integration* perspective, experts stated that digital storytelling is convenient for integration to each phase of the lesson from beginning to end of the lesson. According to them, digital storytelling can be used at specific phase of lesson, at the beginning of lesson, at the end of the lesson, throughout the term, throughout the lesson or even at the end of each course units. In terms of integrational suggestions experts also stated that in order to integrate digital storytelling by its requirements, teachers or pre-service teachers should take an *in-service training* before using it in classroom.

["My personal idea is that digital storytelling should be shown to people who will use it with examples and its theoretical base should also be told. Later on, digital storytelling workshops should be held on in a scheduled program for both students and instructors. I mean educational seminar is needed to be done first and then educators begin practicing of their digital storytelling implementation" (P6)

"Bunun [DHA] gerek kuramsal yani teorik anlatımı gerekirse örneklerle gösterilmesi gerekiyor benim şahsi fikrim. Daha sonradan da öğrencilerle veyahut işte öğretmenlerle çalışılacaksa da öğretmenlerle belirli bir program dahilinde bunların bir workshopları yapılması lazım. Yani bir eğitim semineri yapılması gerekiyor ki o eğitim seminerinden sonra bireylerin artık rahatlıkla kendi dijital hikayelerini öğretme aşamasına geçmeleri gerekiyor" (P6)]

While implementing or integrating digital storytelling in lesson, implementers should decide *focus point of digital storytelling implication* as whether it will be process-oriented or product-oriented. Within this scope, experts suggest to be both process and

product oriented rather than focusing on one of them since students learn both throughout the process itself and by finishing a product at the end.

Furthermore, field experts provided statements about **determinants of integration (32)** process or in other words what affects integrating digital storytelling into education. These statements were grouped into three sub-themes as; barriers of integration (19), factors that affect integration process (10) and enablers of integration (3). For *the barriers of integration*, experts stated stereotyped or prejudiced thoughts of instructors (resistance to change teaching by using classical instructional methods rather than integration of specific technology), inadequate technological infrastructure of institutions, disregarding importance of story itself and its writing process, time consuming process (management of process) and overloading for educators. *Factors that affect integration process* were reported as educational policies (management of country, government programs and etc.), educational system and curriculum (instructional curriculum and components of educational system). *Enablers of digital storytelling integration* were reported by experts as prevalence of technology (government policy for procurement of computers in schools), easy to create a digital story, popularity of learning with technology.

Participants of the second part of the study who are the experts in the field of digital storytelling reported **goals for integration (32)** of digital storytelling or in other words for what aims educators or implementers prefer to use digital storytelling in their instructional curriculum. One of these goals is *promoting learning* (14) through making students to acquire goals of particular discipline and to experience the whole digital story creation process, enabling them to share and transfer their knowledge, facilitating discussions on educational topics and bridging theory and practice. Another goal for integration of digital storytelling is *promoting motivation* (11) of students by attracting their attention or arousing their curiosity. Some other goals behind the integration of digital storytelling reported by field experts are *telling historical events*, *sharing expert knowledge* and *contextual considerations* (aim of use and inside/outside

of school use). Another theme emerged was **types of digital storytelling use (6)** in classroom environment. Within this theme experts' statements organized into three subthemes which are *students create digital story* (3), *instructors develop digital story* (2) and *integration of prepared digital stories* (1) into lesson. The most suggested one is the first type of integration among these three methods through which students create their own digital story by using their creativity and demonstrating their knowledge. On the other hand, some experts lined up with the second way of digital storytelling use in classroom through which they believe, instructors develop their digital stories in order to motivate students, give summary of the lesson and even evaluate students. Expert also provided statements about **interpretation of integration process (5)** and claimed that digital storytelling is co-creative process and fits well to constructivist pedagogy.

4.2.2.3. Subject Areas for Implementation

Participants of the study were posed questions of which courses and areas are suitable for implementation of digital storytelling. Findings from these questions were reported here in two sections as courses that would be preferred for integration of digital storytelling and areas in which digital storytelling can be used.

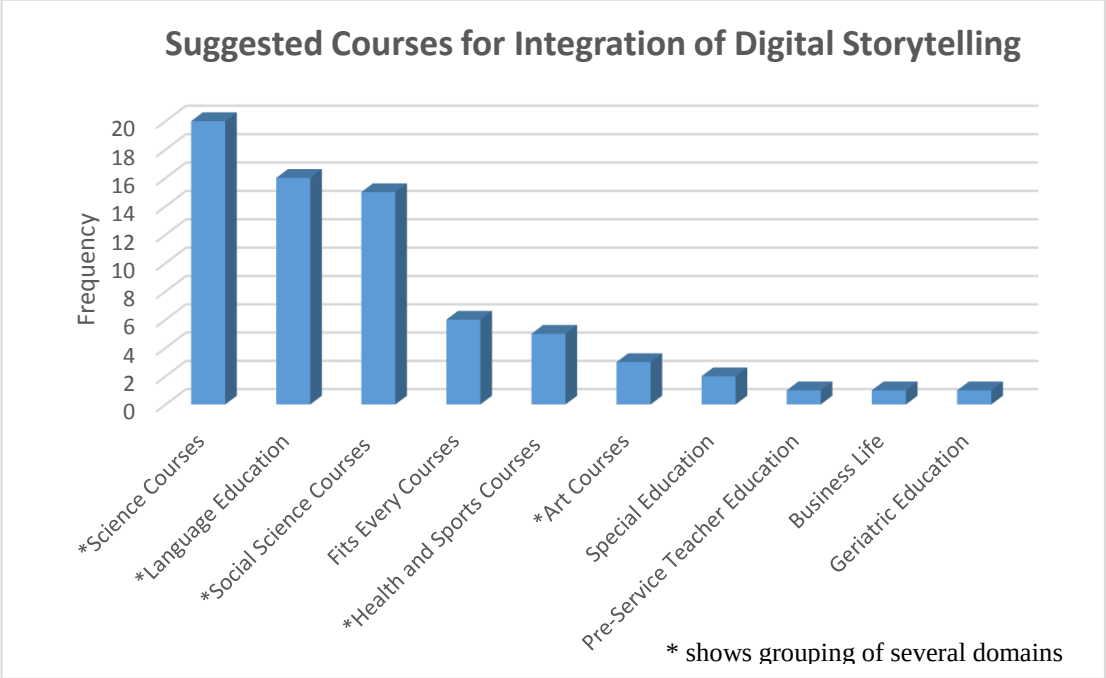

Figure 4.15. Courses Suggested by Experts for Integration of Digital Storytelling

As seen from the *Figure 4.15* above, *science courses* (20) are the most frequently suggested courses for integration of digital storytelling. Among these science courses mathematics (9) was more suggested course by experts and fundamental sciences (6), physics (3), geography (1) and core Sciences (1) follow it. Although *language education* (16) is the first thing that comes to mind for integration of digital storytelling, experts also suggested it for implementing of digital storytelling to a large extent since its naturally fit for digital storytelling in terms of its structural properties. Among these suggestions, foreign or native language education (12) were more frequently proposed and literature (4) follows them. *Social science courses* (14) were suggested thirdly for implementation of digital storytelling by field experts. Among them, social studies course (5) was more frequently mentioned by experts and history (4), humanities (1), religion course (1), psychology (1), culture (1), communicational courses (1) and courses for socializing (1) follow it. Some experts claimed that digital storytelling can be integrated into any kind of lesson without restricting it to some specific courses and this type of statements were reported as the theme of *fits every*

courses (6) in the graph above. Furthermore, *health and sports courses* were proposed by experts as health (3), nursing (1) and sports education (1). *Art courses* as art (1), music (1) and dance (1) were seen as suitable for digital storytelling integration also. Some remarkable statements of experts about suggested courses for integration of digital storytelling were provided below;

> ["I am proponent of its [DST] use in topics which students have a difficulty in comprehending and focusing on the fields in which relatively abstract topics are available like mathematics and sciences. In addition, it should be used in topics which are suitable for creation of story" (P2)
> "Ben özellikle öğrencilerin zorlandığı konularda, matematik ve fen gibi nispeten daha soyut konuların olduğu alanlara yoğunlaşması taraftarıyım. Birde ek olarak şey bir hikayenin oluşturulabilir yani hikaye oluşturmaya uygun olan konular üzerinden de gidilebilir." (P2)]

> ["By the way, I also believe in that fundamental sciences can also be taught contextual. Because mathematics, physics and chemistry correspond something in real life." (P1)
> "Yalnız ben şuna da inanıyorum, mesela temel bilimlerde contextual öğretilebilir. Çünkü matematik, fizik, kimyanın gerçek hayatta karşılığı var." (P1)]

> ["I think it's good, I mean it's truly selected field [Language Education] since we emphasize communication, socializing and self-expression in digital storytelling workshops. This would be done better in using language skills or at language education, so it's logical. Because it's a tool there where it keeps people in process always and make them express themselves" (P3)
> "Bence güzel, yani doğru seçilen bir alan [Dil Eğitimi] çünkü dijital hikaye anlatımı atölyesinde hani iletişim diyoruz, sosyalleşme diyoruz, kendini ifade etme diyoruz. Bu da aslında en iyi yani hani dil becerilerinin dil eğitimin kullanımında bu anlamda mantıklı. Çünkü kişiyi süreçle, sürekli içerisinde tutan ve kendisini ifade etmesini sağlayan bir araç oluyor orda" (P3)]

> ["Digital storytelling can be an important and an effective technology tool and an educational tool for second language acquisition since many digital stories were done in English by people who live in countries where English is not their first language… And it is very helpful again because they have to write a script and they have to pay attention to the language, they have to record a narration and they have to pay attention

to the language after they have created entire story sometimes with text, and titles and credits, they have to pay attention to the language. So, it can be very helpful tool to help second language learners, use English more effectively through the digital storytelling process" (P12)

"Dijital hikaye anlatımı ingilizcenin ana dil olmadığı ülkelerde yaşayan kişiler tarafından İngilizce oluşturulduğundan dil öğrenimi için önemli ve etkili bir eğitsel araç/teknoloji olabilir. Ve yine kişiler metin yazmak, dil kullanımına dikkat etmek, anlatımlarını kaydetmek ve yine hikayeyi oluşturduktan sonra bile gerek metinsel gerek başlık ve jenerik açısından dil kullanıma dikkat etmek zorunda oldukları için çok yararlı bir araç. Bu nedenle, dijital hikaye anlatımı dil öğrenenlere İngilizceyi dijital hikaye anlatımı sürecinde çok etkin kullanacakları için çok yararlı bir araç olabilir." (P12)]

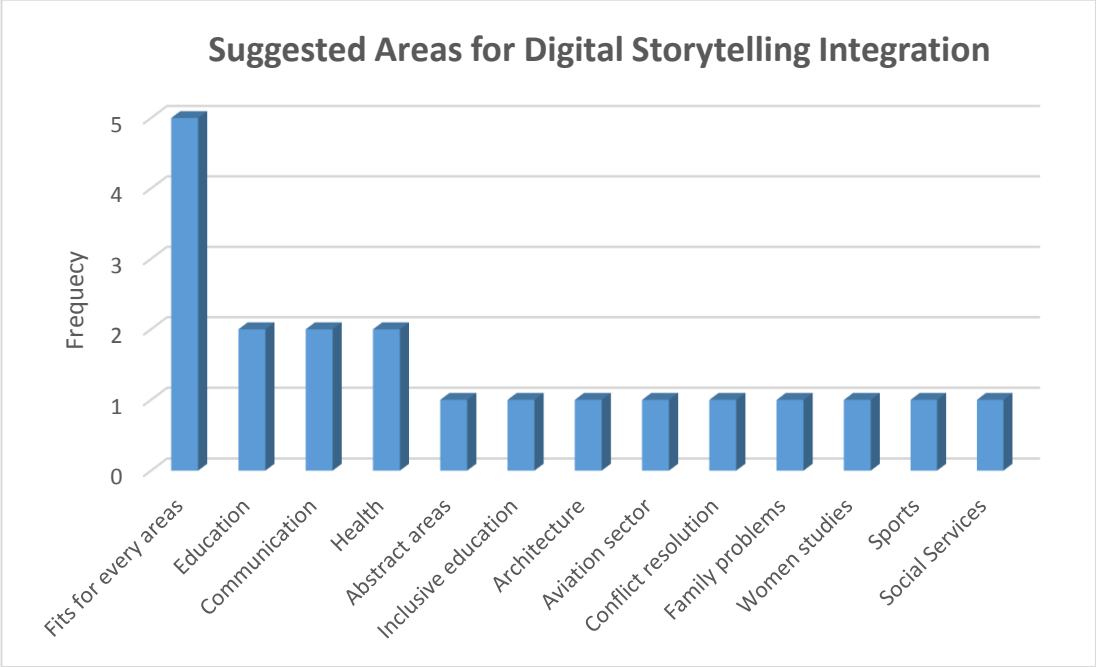

Figure 4.16. Areas Suggested by Experts to Implement Digital Storytelling

As seen from the *Figure 4.16* above, participants emphasized mostly on not restricting digital storytelling with specific areas and claimed that digital storytelling can be used in *every areas* (5). However, they proposed some areas for implementation of digital storytelling for not limiting it to specific areas but to guide future use of digital storytelling by researchers, educators or implementers who are not sure about in which

areas they can use digital storytelling. For instance, they hold a view of its use in *communication* (2) and *health sector* (2) as well as *education* (2). One of field experts stated that digital storytelling should be used in *abstract areas* (1) while another expert states that it should be effective for integrating immigrants into education within the scope of *inclusive education* (1). According to field experts, it can be also used in *architecture, aviation sector, conflict resolution, overcoming family problems, women studies, sports and social services* (*f*=1 respectively). Some remarkable statements of experts were provided below;

> ["I think it [DST] can be used in every areas. There is no need to make restriction I think. It can be investigated by working on each areas" (P5)
> "Bence tüm alanlarda kullanılabilir. Bir sınırlama yapılmaması gerektiğini düşünüyorum. Tüm alanlarda çalışılarak araştırılabilir yani." (P5)]
>
> ["I think education, I mean we can easily use it [DST] in each grade level in education and it has not been used only in education already. Its usability in education was discovered by Robin and it has started to be used in education then." (P6)
> "Bence eğitim, yani eğitimin her kademesinde rahatlıkla kullanabiliriz ki sadece eğitimde kullanılan bir şey değil ki zaten sonradan çıkan yani eğitimde kullanılabileceği Robin'le beraber farkına varılıp uygulamaya konuluyor." (P6)]
>
> ["I think that digital storytelling should be reached or integrated someway to a target group or environments in which abstract, hard to understand, hard to reach, hard to think and hard to apply topics are available" (P2)
> "Ben daha çok soyut ve zor olan, anlaşılması zor, ya da ulaşılması zor ya da düşünmesi, uygulanması zor olan konularda kesinlikle dijital hikayenin ortama ya da o hedef kitleye bir şekilde ulaştırılması veya entegre edilmesi gerektiğini düşünüyorum." (P2)]

4.2.2.4. Optimal Target Group for Implementation

Field experts were asked about which target group is the best for implementation or integration of digital storytelling and responses given to this question were provided below in Figure 4.17.

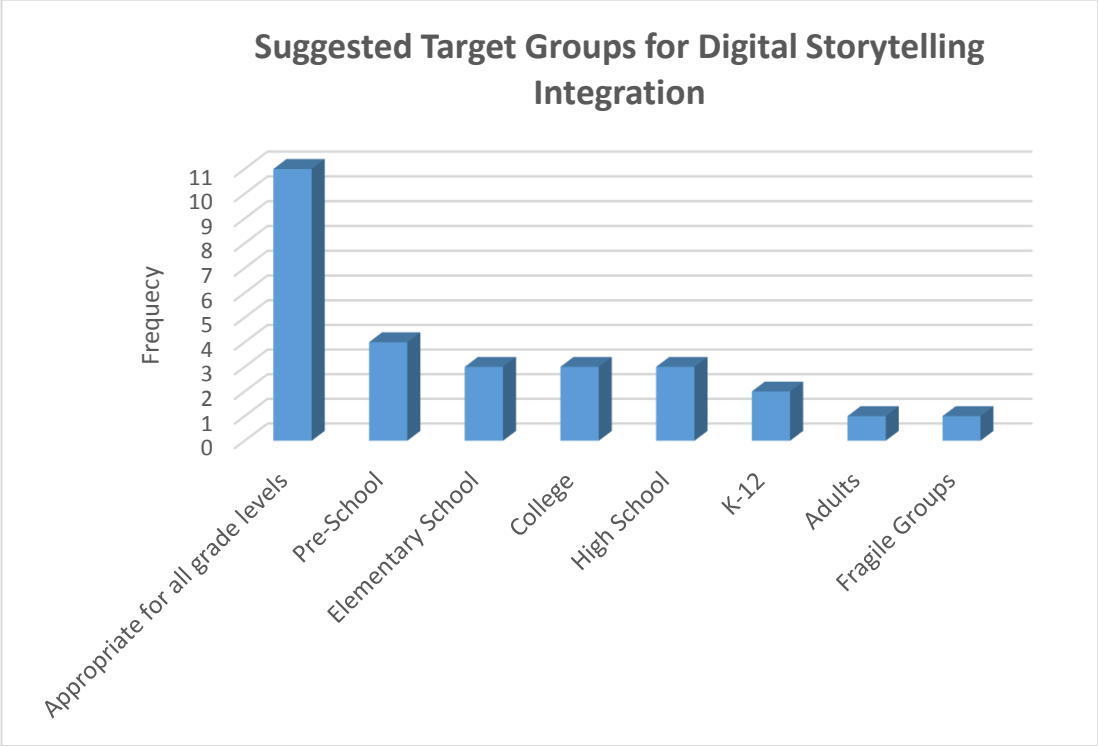

Figure 4.17. Target Group Suggested by Experts to Implement Digital Storytelling

As seen from the *Figure 4.17* above, a great majority of field experts believes that digital storytelling can be used for *all age groups* (11). They also stated that from research perspective, digital storytelling should be investigated for every target group from early childhood to adults since it can give different meaningful result for each specific target group. *Pre-School* (4) students were seen appropriate for digital storytelling implementation by some experts. *Elementary School* (3), *College* (3) and *High School* (3) students were also good for integration of digital storytelling. Some experts stated generally that *K-12 students* (2) might be selected as a target group for digital storytelling implementation. Minority of experts provided that digital storytelling can be integrated into *adult* education (1) and *fragile group* (1) in other words people who are not heard by others such as people being exposed to violence or abuse and refugees. Some important statements of experts are as follows;

["Different meaningful results can be obtained from each target group. Digital storytelling can be used in from pre-school to university and even adult education" (P5)

"Her grupta farklı anlamlı sonuçlar çıkabilir. Dijital hikaye anlatımında bence okul öncesinden üniversiteye yetişkin eğitimine kadar tüm düzeylerde kullanılabilir." (P5)]

"…digital storytelling can be integrated into instruction in many different content areas in multiple grade level. So, with early childhood classrooms with students as young as 4-5 years old under the direction of a teacher all the way up to adult learners even behind college, and graduate school, even older adults a lot of them learn to create digital stories as a way to document significant events in their lives." (P12)
"…dijital hikaye anlatımı öğretime bir çok kademede ve farklı konu alanlarında entegre edilebilir. Yani, öğretmenin yönlendirmesi ile okul öncesi 4-5 yaş grubu öğrencilerinden yetişkin eğitimine kadar hatta üniversite sonrası ve lisansüstü eğitim, ve hatta ileri yaş yetişkinler hayatlarındaki önemli olayları belgelendirmek adına dijital hikaye oluşturmayı öğrenebilir" (P12)

["I mind pre-school and elementary school level. You know why? In those age groups, personality development is so important. That's why I believe in that digital storytelling is so effective for these grade levels. It helps to develop not only knowledge but also personality" (P1)
"Şimdi ben okul öncesi ve ilk öğretimi çok önemsiyorum. Niye biliyor musun? Orda karakter gelişimi de çok önemli ya okulöncesi ve ilköğretimde. O yüzden ben bu hikayelerin çok etkili olduğuna inanıyorum. Sadece bilgi değil, karakter gelişimine de yardım ediyor" (P1)]

4.2.3. Advantages and Disadvantages of Digital Storytelling

Participants were asked about advantages and disadvantages of digital storytelling and its contribution to the related literature. Given responses were categorized and presented as three topics which are namely, (1) Advantages of Digital Storytelling, (2) Disadvantages of Digital Storytelling and (3) Contributions of Digital Storytelling.

4.2.3.1. Advantages of Digital Storytelling

Advantages of digital storytelling were thematized in two main themes as *students' side advantages* and *implementation-based advantages* as shown in Table 4.17 below;

Table 4.17. *Advantages of Digital Storytelling*

Themes	**Sub-Themes**	**Frequency**
Students' side advantages	Meaningful Learning	17
	21st Century Skills	14
	Self-Regulation	9
	Motivation	5
	Learning From Each Other	6
	Developing Social Skills	6
	Promotes Thinking Skills	4
	Enhance Language Skills	3
	Engagement	7
	Development of Attitude toward Content and DST	2
	Promotes Personal Development	2
	Learning Ethical Issues	1
Implementation-based advantages	Ease of Use	5
	Considerations	4
	Student-Centered	4
	Use of Different Purposes	3

Participants provided statements that refer advantages of digital storytelling in terms of **students' side (80)**. Under this main theme, as seen from the Table 4.17 above, experts emphasized on meaningful learning (17), 21st century skills (14), self-regulation (9), motivation (5), learning from each other (6), developing social skills (6), promotes thinking skills (4), enhance language skills (3), engagement (7), development of attitude toward content and digital storytelling, promotes personal development (2), and learning ethical issues (1). *Meaningful Learning* is most frequently referred advantage of digital storytelling. Under this sub-theme, participants

emphasized active learning (3), enabling learning transfer (2), learning by doing (2), achievement (1), providing different perspectives (1), making sense of learning process (1), learning to learn (1), and increasing participation (1). Some remarkable statements were provided below;

> ["I always refer meaningful learning for the advantage [of DST]. Because, you can not teach anything without you make sense of something"
> "Ben avantajı şeye koyuyorum hep, anlamlı öğrenmeye. Çünkü, anlamlaştıramadığın sürece öğretemiyorsun bu bir gerçek. Anlamlı öğrenme." (P1)]

> ["If we look at the digital stories that were prepared by students, the case is here, students' personally involvement into work which we named it as learning by doing model"
> "Öğrencilerin hazırlamış olduğu dijital hikayelere bakarsak burda yaparak, yaşayarak öğrenme modeli dediğimiz yani öğrencinin bizzat işin içine girmesi söz konusu." (P6)]

> ["Even some of them [students] stated with their own words that their grades have increased. 'While I had a difficulty in this course at the beginning, now I realized that I have increased my grades and even my participation to the course thanks to digital storytelling. I have been participating into lesson far less than now' "
> "Hatta bazılarının notlarında kendilerinin ifadeleriyle notlarında yükselme olduğunu söylüyorlar çocuklar. 'Ben hocam bu derste çok zorlanıyorken [ee] dijital hikaye sayesinde notlarımın arttığını gördüm hatta derslere daha fazla katıldığımı hissettim. Daha önce çok daha az katılıyordum' şeklinde" (P2)]

21st century skills were secondly more mentioned issue by participants. Under this sub-theme, experts emphasized ICT skills (4), visual literacy (2), researching skills (2), learning how to use specific technology (1), information literacy (1), and digital literacy (1). Some statements were provided below;

> ["… Of course, since there is a situation in which technology is involved, it [DST] supports skills involving technology use and it also contributes improvement of students' technological skills."
> "…tabii ki teknolojiyi işe koşma durumu olduğu için teknolojiyi içeren birçok beceriyi yine destekleyecektir ve yine teknolojik becerilerinin, öğrencinin gelişmesine katkı sağlayacaktır." (P8)]

["It [DST] allows visual learners to be able to communicate more effective way"
"[DHA] görsel öğrenenlere daha etkili bir iletişim kurma imkanı sunuyor" (P12)]

["It [DST] improves the skill of reaching different resources or information in this context"
"Farklı kaynaklarla işte, şeye bilgiye ulaşma yeteneğini arttırabiliyor bu anlamda" (P2)]

Self-regulation was thirdly more mentioned topic by participants and under this sub-theme, they addressed on self-awareness (3), self-inquiry (2), self-exploration (1), self-development (1), self-understanding (1), and improving self-regulation (1). Some important statements of participants were shown below;

["They [students] states that 'teacher I had never known that I can draw a picture', I'm talking for storyboarding phase, 'but I can draw well' or 'I could not imagine that I can make doubling but I realized that I can do it really, everyone likes it'. Namely, what I mean is that they [students] can perceive, understand or improve their different skills"
"Diyor ki 'ya hocam ben işte daha önce hiç bu kadar resim çizebildiğimi', storyboard aşaması için konuşuyorum, 'bilmiyordum ama güzel çiziyorum' ya da 'ben farklı sesler çıkarıp böyle dublaj yapabileceğimi sanmıyordum ama gerçekten yapıyormuşum herkes çok beğendi diye'. Yani demek istediğim farklı becerilerini öğrenciler algılayabiliyor, anlayabiliyor ya da geliştirebiliyor" (P2)]

["This method [DST] is working for young students whose self-regulation has not developed yet. Namely, it's more effective. Especially, children at preschool level are impressed a lot and learns as well"
"Henüz self-regulasyonu gelişmemiş genç yaştaki öğrencilerde bence çok iyi işliyor bu yöntem.Yani gerçekten çok etkili. Okulöncesinde hele, çocuklar çok etkileniyorlar ya ve öğreniyorlar." (P1)]

Experts were also mentioned *motivation* factor while describing advantages of digital storytelling. Under this sub-theme, experts emphasized creation of a synergy (2), adoption and love process (2), appealing for students (1), incentive for students to do better work (1), and extraordinary experience (1). Below some statements of participant provided;

["It [DST] provides creation of a good synergy they [students] usually refer support of peers or teachers while they explain how to overcome their faced difficulties."
"Yani bu güzel bir sinerjinin de oluşmasını sağlıyor zaten kendileri de hani zorlandıkları kısımları nasıl aştıklarını açıklarken hep arkadaş veya işte öğretmenimizin desteği vesaire gibi ifadeler kullanıyorlar"(P11)]

["the peer component where other students, other people are going to be dealing with the digital story often that makes challenges students who are creating digital story to do better job because they know that peers so other people are going to be dealing with it. So, there is an incentive for them to do better work"
"Dijital hikaye ile uğraşacak olan diğer öğrencilerin veya kişilerin olduğu akran bileşeni dijital hikayeleri daha iyi bir iş için oluşturan öğrencileri zorlamakta çünkü akranlarının veya diğer kişilerin onunla uğraşacaklarını biliyorlar. Bu yüzden, onlar için daha iyi bir iş çıkarmak adına teşvik bulunmakta" (P12)]

Experts also placed stress on *learning from each other* during creation of a digital story through sharing experience (3), peer feedback (2) and collaborative learning (1). Some remarkable statements were provided below;

["Their occupational sharing throughout a digital storytelling workshop held on a specific context, namely there is a sharing [of an experience] during this [DST process] and as a result of this it provides occupational development"
"Kendi mesleki paylaşımları falan hani bir bağlam bazında o atölye çalışmaları oluşturuyoruz. Bir paylaşım olduğu için orda bir mesleki gelişim sağlar" (P5)]

["On the basis, we can say that when students look at what they have written at the end of the process and enhance them with other tools and look at again final version of their work, we have been evaluating them individually, we have been involving certainly this process. We evaluate as a class and students also evaluate them individually and make comments on them. This evaluating process in digital storytelling process is so important. Because, they have a chance to see themselves [evaluation of their work] from others' perspective. They learn to look at themselves from other side and see the point which they haven't seen before"

"En temelde de şunu söyleyelim yazdığı yazıyı bitirip baktığında ve onları başka araçlarla süsleyip en son şekline baktığında her birinin böyle bir sonuçta tekrar onları değerlendiriyorduk o aşamayı mutlaka

> yapıyorduk. Sınıfça hep birlikte değerlendiriyor öğrencilerde değerlendiriyor, yorumlarını yapıyorlar. O değerlendirme aşamasında dijital öyküde olması bence çok önemli. Çünkü başkalarının gözünden de kendini görmüş oluyor. Kendine başka bir yerden bakmış olmayı öğreniyor ve kendi göremediği noktalarını görüyor" (P9)]

Participants underlined *developing social skills* while describing the advantages of digital storytelling. Under this sub-theme, they emphasized communication skills (4), understanding each other (1), and providing social environment (1). Furthermore, they also address *promoting thinking skills* as creative thinking skills (3) and critical thinking skills (1) and *enhancing language skills* through creative writing (2) and language use (1). Some remarkable statements in terms of these themes were provided below.

> ["… I think that digital storytelling is very important for social relationships of students. Because, while they are creating/developing their stories, we see that they communicate with people around themselves whether their families or their friends. It's [DST] so important in terms of social relationship"
> "…öğrencilerin sosyal ilişkileri içinde ben dijital hikayelerin çok önemli olduğunu düşünüyorum. Çünkü öğrenciler hikayelerini oluştururken, yaratırken, kimi zaman etrafıyla [ee] işte gerek kendi arkadaşlarıyla gerek ailesiyle ya da gerek çevresindeki insanlarla da diyaloğa geçtiğini görüyoruz dijital hikayelerini hazırlarken. Sosyal ilişkiler açısından da çok önemli." (P6)]

> ["Avantajları, öğrencinin benim için yaratıcı zeka çok önemli."
> "Its advantages, the important thing according to me is creative intelligence of students" (P9)]

> ["I can say that it improves skills like critical thinking"
> "Eleştirel düşünme, gibi becerilere katkısı olduğunu söyleyebilirim" (P8)]

> ["The most important advantage of digital storytelling, according to me, is that while it improves writing skills, it also turns students into creative perspective and make them to dance with the words in order to re-imagine them. Because we think with words. In this context, I think, it provides important advantages in terms of writing"
> "…bana göre en büyük avantajı yazma becerisini geliştirirken onu yaratıcı bir perspektife doğru döndürüp kelimeler üzerinde onları dans

ettirip onlarla yeniden hayal edebilir. Çünkü biz kelimelerle düşünüyoruz. Bu bağlamda yazma açısından çok önemli avantajlar sağladığını düşünüyorum" (P9)]

In addition to these, field experts mentioned some other advantages of digital storytelling as *engagement* (7), *development of attitude toward content and DST* (2), *promoting personal development* (2), and *learning ethical issues* (1). Some statements with respect to them were provided below;

["Certainly, I can say that it increases students' attitude toward the field/topic they work or digital story itself"
"Şimdi kesinlikle birde şey, hangi alanda çalışılıyorsa hangi konuda çalışıyorsa buna olan tutumunun da öğrencinin hem bu dijital hikayenin kendisine hem de hangi konuda çalışılıyorsa ona ilgili onunla ilgili tutumunun arttığını söyleyebilirim bu anlamda." (P2)]

["It not only helps improving knowledge but also personal development"
"Sadece bilgi değil, karakter gelişimine de yardım ediyor" (P1)]

["For instance, when they search on the internet in terms of finding visuals, they also learn the copyright of their selected visuals."
"Mesela görsel aramada bile internetten aradıklarında etik yani şey kullanıma açık, hani görsellerin onun copyright haklarını da hani öğrenmiş oluyorlar" (P5)]

Participants provided some **implementation-based advantages (16)** of digital storytelling and these were grouped into four sub-themes (see Table 4.17 above) as ease of use (5), considerations (4), student-centered (4) and use for different purposes (3). *Ease of use* is the most frequently referred advantage of digital storytelling in terms of implementation. Under this sub-theme, experts emphasized easy to create and share (2), archiving stories (1), providing secure and closed environment (1), and provides flexible structure (1). Some exemplary statements of participants were provided below;

["Technology is so improved and provides us so many opportunities. We have an important advantage of both making our voice to be heard and sharing them with other people with the help of this opportunities"
"Teknoloji o kadar gelişti, o kadar bize olanaklar sunuyor ki. Bu olanaklarla birlikte insanların sesini duyurabilmeleri konusunda hem

seslerin örgütlenmesi hem de paylaşılması konusunda çok ciddi bir avantajımız var" (P4)

"It [DST] provides an environment through which stories are being told, collected and archived. This is very important advantage"
"bu hikayelerin anlatılması, toparlanması ve arşivlenmesini de sağlayacak bir ortamı da sunuyor bu. Bu da çok ciddi bir avantaj" (P4)]

Participants also mentioned some *considerations* in terms of digital storytelling advantages at the implementation side. Under this sub-theme they emphasized digital storytelling as different type of learning method (2), inclusion class (1), and its timely and reasonably use (1). Within this scope, they approach digital storytelling as an alternative method for going beyond the ordinary, advantageous for inclusion class and more helpful when it's used timely and reasonably. Furthermore, experts referred digital storytelling advantage of being *student-centered* and its advantage of *using for different purposes* as transferring experience to next generations (1), sharing confidential stories (1) and using for therapy (1). Some statements were provided below;

["My own idea [about DST] is that digital storytelling can be easily adapted into student-centered education which is demanded [in educational system] you know"
"Şahsi fikrim benim dijital hikaye anlatımı öğrenci merkezli eğitime ki istenilen de o biliyorsunuz, öğrenci merkezli eğitime gayet adapte edilebilecek seviyede"
"People can use DST a tool for sharing their stories which they cannot share with other people in face-to-face communication"
"İnsanların diğer insanlarla paylaşamadığı, yüz yüze paylaşamadığı hikayelerini bir araç yani dijital hikayelerle paylaştığı bir eylem olarak ortaya çıkıyor." (P6)]

["Another thing which I give importance to is that you can obtain experience of people since personal narratives emerge in digital storytelling workshop. These obtained experiences can be a message for next generations. For instance, it can provide a communication with previous generation"
"Diğer değer verdiğim bir şey ise kişinin kendi anlatıları olduğu için yani burada dijital hikaye anlatımı atölyesinde sanki kişinin deneyimlerini

alabiliyorsun. Bu deneyimler sonraki kuşaklara bir mesaj olabilir. Mesela bir kuşak öncesi iletişim sağlayabilir." (P3)]

4.2.3.2. Disadvantages of Digital Storytelling

Disadvantages of digital storytelling were themtazied in four main themes as *instructor side disadvantages, technological issues, student side disadvantages* and *implementation-based disadvantages* as shown in Table 4.18 below;

Table 4.18. *Disadvantages of Digital Storytelling*

Themes	**Frequency**
Instructor Side Disadvantages	12
Technological Issues	12
Student Side Disadvantages	9
Implementation-based Disadvantages	8

Participants provided some statements about disadvantages of digital storytelling in terms of **instructors' side (12)**. Under this main theme, participants emphasized on *time consuming* (7), *need of an organization* (4), and *challenging for instructors* (1). Some remarkable statements were provided below;

["In terms of disadvantage, it can be said that digital storytelling process is a little bit long process, I mean collecting materials, obtaining visuals and to find demanded resources can be challenging. It [DST] can be disadvantageous in terms of these perspectives."
"Dezavantajı açısından hani süreç hani biraz uzun olması, hani bunların elde edilmesi, görsellerin toplanması istediğinize göre bulabilmek bunlar zorlayıcı olabilir. Bu açılardan hani dezavantajı olabilir." (P5)]

["…it [DST] requires time that not a lot of educators have to expand the what's going on in classroom to include digital storytelling sometimes means they have to, the teachers has to take something else away."
"…birçok eğitimcinin sınıf içinde rutin olanların dışında çıkıp dijital hikaye anlatımını dahil edemediği bir zamana ihtiyaç duymaktadır [DHA] ve bu durum bazen eğitimcilerin bazı şeyleri çıkarmasına neden olmaktadır"

"It [DST] usually takes longer than just you know one day, or one hour to be really successful I think it takes several days maybe even weeks in fact…it lasts for four months which is a long time and much longer than most public schools teachers would have to integrate digital storytelling into their classroom. So, they don't have four months to do it, maybe they do it four days if they're lucky they may have weeks. So, time commitment is the one of the disadvantages I believe is."
"[DHA] genellikle bir gün, bir saat gibi bilinenden daha fazla süre almaktadır. Gerçekten başarılı olmak için bence birkaç gün belki de haftalar almalıdır. 4 ay sürebilir ve bu zaman devlet okullarındaki öğretmenlerin sınıflarına dijital hikaye anlatımını entegre etmek için oldukça uzun bir zaman. Bu yüzden, öğretmenlerin 4 aylık bir zamanı olmayabilir, belki 4 günleri olabilir veya şanslılarsa birkaç haftalık zamanları olabilir. Bana göre zaman sorunu dezavantajlarından biri" (P12)]

["If we mention its [DST] disadvantages, it requires to be implemented truly. How to use of Digital Storytelling should be well-determined according to aimed situations or goals and this process should be managed well"
"Dezavantaj noktasına gelirsek, dezavantajları şu, doğru uygulanması gerekiyor. Amaçlanan şeye göre, amaçlanan duruma göre, hedefe göre, dijital öykülerin nasıl kullanılacağını iyi belirlenmesi ve bu sürecin iyi yönetilmesi gerekiyor." (P8)]

Experts mention some disadvantages of digital storytelling regarding to **technological issues (12)**. Under this theme they emphasized *students' technological knowledge* (6) and *accessing to specific technological facilities* (6). Some statements provided below;

["…for its [DST] disadvantage firstly I can say that technological knowledge is so important and if students' technological knowledge is not good enough, it's hard to involve them into process and obtaining yield from them is even more hard"
"…dezavantaj olarak daha çok hani ilk etapta şey geliyor aklıma teknolojik altyapının çok önemli olduğu, öğrencide o altyapı çok iyi değilse o öğrenciyi hem sürece katmak zaten zor, ondan verim almak çok daha zorlaşıyor." (P2)]

["If we think disadvantages of DST, I can say that one of the most frequently faced problems is, of course we can see this in low grade levels e.g. primary school or at the beginning of the elementary school, that students can sometimes have a difficulty in using technology. I mean they

can sometimes face with problems when they transfer their prepared stories into digital environment by using software like MovieMaker"
"Dezavantajları olarak baktığınız da şöyle söyleyim. En çok yaşanan sorunlardan bir tanesi bilhassa tabii ki alt kademedeki öğrencilerde görebiliyoruz biz bunları, ilkokul ve ortaokulun başlarında. Teknolojiyi kullanım konusunda da bazen zorluk yaşayabiliyorlar. Yani oluşturdukları hikayeleri dijital ortama yani MovieMaker gibi programları kullanarak dijital ortama aktarmada bazen sorun yaşayabiliyorlar" (P6)]

["If we look at its [DST] disadvantages, we can say that technological tools and its unclarity of reaching them in everywhere is a disadvantage. Since there is a difference between children in rural areas and children having various kinds of facilities in urban areas in terms of reaching technological tools, their use of technology differs also"
"Bir dezavantajlarına gelirsek teknolojik araçlar ve bunların her noktada erişimi açık olmamış olması bir dezavantaj. Bir köydeki çocukla şehirde çeşitli imkânlara sahip olan çocuk aynı şartlarda olmadığı için her birinin ulaşımı da aynı noktada kullanılmıyor" (P9)]

Participants addressed on some **students' side disadvantages (9)** as follows; *challenging for students* (6), *peer conflict* (1), *needing various skills* (1), and *concept conflict* (1). Some remarkable statements were provided below;

["For instance, there is a matter of disagreement among students especially in collaborative environments. There might be a problem in task distribution or when one student does not do his/her duty, other student is overloaded.
"Mesela özellikle işbirlikli ortamda öğrencilerin kendi aralarındaki anlaşmazlıkları söz konusu olabiliyor. Görev dağılımlarında sıkıntı olabiliyor. Ya da kendi sorumluluklarını yapmadığında başka bir öğrenciye yük binebiliyor" (P2)]

["When developing the story part, it requires a creativity, I mean writing a story especially for gaining educational goals or teaching a specific topic requires to use language correctly and you try to both reaching educational goals and make the process to be interesting"
"Hikaye kısmını oluştururken tabi ki bir yaratıcılık gerektiriyor yani hikayeyi yazma işi özellikle de bir kazanımı kazandırmak amaçlı bir konuyu öğretmek amaçlı hazırlanan öyküler hani hem dili doğru kullanmayı gerektiriyor, hem hani bir konu kazandırmaya

çalışıyorsunuz, hem de bir taraftan da ilgi çekici olması gerekiyor." (P11)]

Expert mentioned **implementation-based disadvantages (8)** of digital storytelling process. Under this theme they emphasized *need of special evaluation methods* (5), *need of smaller groups to be worked* (2), and *losing its effectiveness by overusing* (1). Some remarkable statements were provided below;

> ["Disadvantage of it [DST] in terms of learning and instruction is that if a digital storytelling workshop was held on learning or teaching something, did it do this? I'm not sure about measuring this by this tool" "Eğitim öğretim açısından dezavantaj, acaba hikaye dijital hikaye atölyesi hakikaten bir şeyi öğrenme öğretme amacıyla yapıldıysa hani bunu gerçekleştirdi mi? Bunu ölçmek bu araçla ne kadar doğru bilemem" (P3)]

> ["What is its [DST] disadvantages? When it's used perpetually and over and over again, it loses its effect on students. Some instructors try to use every topic for digital storytelling. This makes no-sense. I mean digital storytelling is a method which loses its effect when used perpetually." "Dezavantajları ne? Ya, çok kullanıldığında aralıksız ve çok kullanıldığında etkisi kalmıyor öğrenci üstünde. Bazı hocalarda her şeyi dijital hikayenin üstüne koymaya çalışıyor. Ya bu da anlamı değil, yani. Dijital hikaye sürekli kullanıldığında etkisini kaybeden bir yöntem" (P1)]

4.2.3.3. Contributions of Digital Storytelling

Contributions of digital storytelling were themtazied in three main themes namely, *Research Oriented Suggestions*, *Contributions*, and *Implementation-based Issues* as shown in Table 4.19 below.

Table 4.19. *Contributions of Digital Storytelling*

Themes	**Sub-Themes**	**Frequency**
Research Oriented Suggestions	Research Problems to be Investigated (153) Needs (38) Conceptual Problems (3)	194
Contributions	Literature (4) Method (1)	5

Implementation-based Issues	5

Participants provided some statements that refer to contributions of digital storytelling in terms of research studies. These statements merged in main theme of **research oriented suggestions (194)** as seen from the Table 4.19 above. Under this main theme, participants emphasized research problems to be investigated (153), needs (38), and conceptual problems (3). Statements that refer what should be worked or investigated in digital storytelling studies were grouped into *research problems to be investigated* sub-theme and statements in this theme were grouped into 14 sub-themes namely, skill development (51), learning process (16), other research problems (14), learning outcomes (13), Self-regulation (12), collaboration (8), societal issues (8), achievement (7), learning strategies (6), socialization (6), participation (5), attitude (3), engagement (3), and motivation (1). Experts more frequently emphasized *skill development* while giving suggestions about what should be investigated with digital storytelling studies. They believe that 21st century skills (14), thinking skills (11), problem solving skills (10), language skills (10), decision making skills (1), and reflection skills (1) should be investigated under the heading of skill development throughout digital storytelling studies. Some remarkable statements about skill development were provided below;

> ["…in both native and foreign language education, my own idea is that there is a need for conducting studies about skill development. Namely, development of listening, reading, writing and speaking skills and if you look at content of digital stories, it can be easily used method for development of these 4 skills."
> "…gerek anadil eğitiminde ve gerek yabancı dil eğitiminde benim şahsi fikrim becerilerin geliştirilmesi üzerinde çalışmalar yapılması gerekiyor. Yani dinleme, okuma, yazma, konuşma gibi becerilerin geliştirilmesinde ki dijital hikayede içerik olarak baktığınızda aslında bu 4 beceriyi de geliştirmede çok rahatlıkla kullanılabilecek bir yöntem." (P6)]
>
> ["Writing skill is the most important skill from the beginning of primary school, we try to make students obtain this type of skills. These skills can be developed"

"İşte yazma becerisini mesela çok önemli bir beceri aslında ilk okuldan itibaren çocuklara biz bu becerileri kazandırmaya çalışıyoruz. Bunlar geliştirilebilir" (P8)]

["…decision making can be investigated. In digital storytelling workshop, people query themselves, think and it can be helpful to them when they don't decide something by questioning something. I mean skills like decision making and occupational decision making can be investigated according to me"
"…karar verme olabilir. Dijital hikaye anlatımı atölyesinde kişi kendisini sorguluyor, iliştiriyor, düşünüyor ve bir şeyleri sorgulayarak karar veremediği durumlara yardımcı olabiliyor. Yani karar verme, mesleki karar verme … gibi becerilerde bence incelenebilir" (P3)]

In terms of *learning process*, experts elaborate on experience, understanding mental process (memory and mental process analysis), and exploring new content.

["More importance should be given to people's qualitative experience, content-based workshops should be held with reference to people's own personal experience and these experiences should be investigated according to me"
"hani biraz daha hani nitelimsi deneyimlerin, kişilerin kendi yaşantılarından hareketle bağlama odaklı şeylerin atölyelerin hani oluşturulması o şekilde araştırılması … gerektiğini düşünüyorum" (P5)]

Participants' statements about problems to be investigated that can not be grouped under separate topic grouped under *other research problems* sub-theme. Experts emphasized some problems to be investigated as follows; product evaluation (3), process-based questions (2), psychological aspects (1), reception (1), adult education (1), concept conflict (1), emotional dimension (1), inclusive education (1), looking story itself (1), and investigating individual cases (1). Some statements were provided below.

["Research questions should be increased in product evaluation part. When the process is compared to products which are developed at the end of the process, in order to see harmony of these two things (process and product) some research questions can be questioned in terms of product evaluation"
"Ürün değerlendirme kısmında da bence araştırma sorularının biraz daha arttırılması gerekebilir. Ürün odaklı çalışmalarda hani sürecin sonunda oluşan ürünlerle o sürecin kıyaslaması yapıldığında belki hani ikisinin ne

kadar uyumlu ne kadar iyi gittiğini görmek adına ürünlerin değerlendirilmesi konusunda da birtakım araştırma sorularına yönelilebilir." (P2)]

["Even we see that very shy people who can not share their ideas in normal ways in front of the other people can be very social and share their ideas and knowledge in digital platforms. While they can not do this in normal social environment or physical environment, they can do this in social [media] platforms or digital environments. For instance, this type of physiological aspects should be investigated"
"Çok çekingen, normal işte normal bir şekilde insanlar karşısında düşüncelerini anlatamayan bireylerin bile, utangaç bireylerin bile dijital platformlara geldiğinde biz aslında çok fazla [eee] sosyal ya da işte bilgi paylaşabilen, konuşkan insanlar olduğunu görüyoruz dijital platformda. Normal sosyal bir ortamda, normal fiziksel bir ortamda bunu yapamıyorken, sosyal platformlarda ya da dijital ortamlarda bunu yapabiliyorlar. Mesela psikolojik boyutlarıyla bu incelenebilir" (P8)]

Participants also put emphasis on *learning outcomes* while they mention problems to be investigated through digital storytelling studies. Within this scope they refer meaning making (2) or in other words making sense of created/watched digital stories. Furthermore, they advised to manage digital storytelling process as learning-based (2) namely, not just creation of a product but learning something from the process also. According to some of the field experts, a relationship between digital storytelling process and academic achievement or learning outcomes (1) should be investigated also. Besides, learning transfer (1) dimension should also be inspected to see whether students can transfer their learning outcomes to other areas.

["It [DST] can be employed as performance evaluation approach in K-12 or higher level and it can be used to see whether students or learners transfer their knowledge in these activities. There might be a need to investigate this, I think."
"K-12 düzeyinde ve sonraki düzeylerde de bunun aslında bir performans değerlendirme yaklaşımı olarakta benimsenip öğrenenlerden ya da öğrencilerden bu etkinlikleri özellikle bilgilerini transfer edip, edemediklerini görme açısından kullanılabilir ve bunların araştırılması gerekebilir diye düşünüyorum" (P8)]

Participants also emphasized on *self-regulation* and its sub-dimensions as self-efficacy (3), self-inquiry (1), self-awareness (1), intrinsic motivation (1), individual

development (1), self-evaluation (1), self-reflection (1), identity (1) and online presence (1) while they were stating problems that should be investigated in digital storytelling research studies. Furthermore, they stated *collaboration* dimension that should be also inspected. In this dimension, they emphasized collaboration (3), sharing (3) and co-creativity (2) features of digital story creation process. In addition to these, participants mentioned *societal issues* as immigrant integration (2), culture (1), inspection of communal (1) and social aspects (1), different perspectives (1), racing (1) and democracy consciousness (1) that should be investigated in digital storytelling studies.

> ["Not only from academic skill perspective, but also human relationships from different perspectives e.g. sociological dimensions, communal dimensions and effect of digital stories on this should be investigated"
> "sadece akademik beceriler açısından değilde, farklı açılardan da insan ilişkileri işte sosyolojik boyutları, toplumsal boyutları açısından da belki dijital hikayelerin etkilerinin araştırılması gerekebilir" (P8)]

Experts proposed that academic *achievement* (7) should be also investigated in studies. They also referred *learning strategies* (6) as problem-based learning (1), learning to learn (1) and learning by doing (1).

> ["Learning strategies might be also investigated. Because it's so complicated process. Various kinds of variables can reveal. In this sense, students can use different strategies or some strategies that they have not used before in this process.
> "Öğrenme stratejileri üzerinden de belki gidilebilir. Çünkü çok komplike bir süreç. Çok farklı değişkenler ortaya çıkabiliyor. Bu anlamda öğrenci farklı stratejileri kullanabiliyor ya da daha önce kullanmadığı birtakım stratejilerini bu süreçte kullanabiliyor" (P8)]

Field experts also mentioned *socialization* (6) e.g. social development (1), social aspects (1) and social communication skills (1), *participation* (6) as feedback (2), reasons for non-participation (1) and *attitude* (3), *engagement* (3) and *motivation* (1) that should be investigated in digital storytelling studies.

Participants referred some *needs* (38) while providing research oriented suggestions. Within this scope they mentioned need for research studies (16) namely, experimental studies (5), in-depth research studies (3), qualitative studies (2), popularizing studies (2), high quality research (1), and studies examining reasons for non-participation (1).

> ["There is a need for experimental and controlled studies because we can teach more effectively in a short time. I mean, we can teach specific topic with less effort, more simpler material or method. So, we need to understand the effect size, whether it's worth to invest this. I think like this."
> "Daha çok deneysele ihtiyaç var orda kontrollü çalışmaya ihtiyaç var çünkü mesela daha kısa sürede daha etkili öğretilebiliyorda olabiliriz. Yani daha az emekle daha basit materyalle daha basit yöntemle öğretebiliyor olabiliriz, o yöntemi, o konuyu. Onun için o şeyi bir anlamamız lazım ya. Yani bunun effect size'ı ne? Değer mi? Buna yatırım yapmaya değer mi? Ben öyle düşünüyorum."
> "We don't know how much of students' achievement comes from this method and this kind of effect can only be understood with experimental studies, there is no other way for this. You cannot separate with other ways"
> "Hani öğrenci başarısının ne kadarı bu yöntemden geliyor onu bilmiyoruz ve bu tür etki anca deneysel çalışmalarla anlaşılır hocam, başka türlü anlaşılmaz. Başka türlü ayrıştıramazsın." (P1)]

> ["So, that would require I think an experimental study where one group of students explore the topic or content through the traditional classroom process and other students create digital stories and then after both of these were done then the two groups would be explored to see who had better learning achievement."
> "Bence deneysel çalışmalara ihtiyaç var. Bu çalışmalarla bir grup öğrenci bir konuyu geleneksel sınıf süreci ile keşfederken diğer bir grup dijital hikayeler oluşturabilir ve daha sonra bu iki grupta süreci bitirdikten sonra hangi grubun daha başarılı olduğu araştırılabilir" (P12)]

Experts stated some other needs for research studies as topic selection (4) for digital stories e.g. unknown topics or topics that students have a difficulty with, gender comparison (3) studies, studies that investigate which subject matter (2) best suits for digital storytelling, investigating digital storytelling use with new technologies (1), studies identifying critical success factors (1), and inspecting digital storytelling use

with different type of participant groups (1). In addition to needs for research studies, experts also suggested some *conceptual problems* (3) that should be investigated also. One of them is concept conflict (2) which they mean that digital storytelling is misunderstood by some people and some digital videos named as digital story while they are not actually. Another conceptual problem is that there is no any clear discrimination (1) of digital storytelling use in workshop format or normal way and this should be investigated according to some field experts.

> ["We can see many research studies. Some of them made audiovisual video or audio book and named as digital story. I mean, there is a critical conceptual conflict in literature. From a scientific perspective, there is a need for research studies in order to solve these conflicts"
> "Yani birçok çalışma görüyoruz. Resmen sesli video yapmış. Sesli kitap yapmış. Adını dijital hikaye demiş. Yani literatürde ciddi bir kavram yanılması var. Bilimsel açıdan da bu kavram yanılgılarının giderilmesi açısından çalışmalara ihtiyaç var bence." (P3)]

Experts also mentioned *contributions* (5) of digital storytelling in general and literature contributions (4) and method contributions (1) specifically. For instance, they stated that digital storytelling contributes related literature with scientific studies if the logic behind is revealed. Furthermore, some experts claimed that digital storytelling can be considered as a different learning method and this can also contributes to the literature. Besides, some experts mentioned *implementation-based issues* (5) and claimed that contributions of digital storytelling for related literature depend on how it is used, for which topics it is studied, for which aims it is used, for which target group it is used and how it is based on theoretical or conceptual framework.

4.2.4. Research Agenda for Digital Storytelling

Field experts were asked some questions that lead them to reveal their opinions about research agenda for digital storytelling. Within this scope, they were asked about what should be aimed in digital storytelling studies by researchers, what should be the research questions, and which variables or constructs should be investigated in digital

storytelling studies. Given responses to these questions were thematized and provided below with two main titles.

4.2.4.1. Aims for Digital storytelling Studies

Field experts were posed a question of what researchers should aim in digital storytelling studies and responses given to this question were grouped into two main themes as *research-based goals* and *implementation-based goals* that were presented in Table 4.20 below.

Table 4.20. *Aims for Digital Storytelling Studies*

Themes	**Sub-Themes**	**Frequency**
Research-based Goals	Methodological	15
	Research Topic	11
Implementation-based goals	Students' Side Considerations	9
	Process & Product Focus	7
	Integration-based Considerations	3

Field experts provided some statements that are related with research studies, so these type of statements were thematized as **research-based goals (26)**. Under these theme, experts emphasized methodological (15) and research topic (11) considerations. Within the scope of *methodological* considerations, they referred some needs for research studies. For instance, they stated that efficiency (7) of digital storytelling should be aimed to investigate by researchers and effect size is important measure for this.

> ["We need to understand this teaching method's efficiency. This is so important, in other words does it work or not? If it works where?"
> "Şimdi bu öğretim yönteminin etkililiğini anlamamız lazım hocam. Bu çok önemli yani çalışıyor mu çalışmıyor mu? Çalışıyorsa nerde çalışıyor?"
> "I think, there is a need of research studies that separates/investigates how much digital storytelling effects. Rather than asking genera

> questions like ‘How did you like it’, some specific questions should be asked like ‘Has it been effective?’, ‘How much it has been effective’. We need to see effect size.”
> “Acaba dijital hikaye ne kadar etki yaptı’yı araştırıp ayrıştıracak araştırmalara ihtiyaç var diyorum ben. Yani genelgeçer işte “How did you like it?” soruları dışında etkili oldu mu? Ne kadar etkili oldu? Biraz effect size’ı görmemiz lazım.” (P1)]

In addition to efficiency studies, field experts also addressed the need of in-depth research studies (3), experimental studies (3) and qualitative studies (2).

> [“…I think there is a need of investigating something in-depth focus like people’s reflections, experience throughout the digital storytelling workshop process rather than effect of digital storytelling”
> “…yani dijital hikaye anlatımı daha çok etkiden ziyade biraz daha hani o kişilerin yansıma, yaşantıları hani o atölye süreçlerindeki deneyimler, hani o şekilde ele alınarak biraz daha böyle nitel yani derinlemesine odaklı şeylerin araştırılması gerektiğini düşünüyorum.” (P5)]

> [“I think products should be investigated in-depth to see some effects which has not been realized before. Not only its [DST] effects on some skills but also revealed products should be evaluated to make in-depth investigations about knowledge, mindset or emotion structure of people”
> “Ürünler derinlikli incelenip, derinlemesine incelenip belki gözden kaçan işte birtakım etkileri araştırılabilir diye düşünüyorum. Yani sadece birtakım becerilere etkisi değil de ortaya konulan ürünlerinde değerlendirilerek kişilerin bilgi yapısı, düşünce yapısı, duygu yapısı sınanarak derinlikli incelemeler yapılabilir diye düşünüyorum” (P8)]

> [“…there is need of in-depth investigation in this process. It’s needed to observe people in-depth and spend more time with them. This is important according to me”
> “…bu süreçte derinlemesine incelemelere ihtiyaç var. Derinlemesine bir gözlem gerekli, kişilerle daha fazla vakit geçirmek gerekli. Bu önemli bence.”(P3)]

Field experts proposed some *research topics* to be investigated as follows; identifying social success factors (1), inspecting relationship between digital storytelling and academic achievement (1), investigating relationship between digital storytelling and learning outcomes (1), considering psychological aspects (1), improving students’ thinking perspectives (1), using digital storytelling for effective learning (1), creative

thinking (1), reflection (1), acquiring goals for particular discipline (1), development of 21st century skills (1), and inspecting making sense of digital storytelling (1).

Furthermore, experts provided some statements about the aim of digital storytelling use in implementation side and these were thematized as **implementation-based goals (19)**. Under these theme, experts emphasized students' side considerations (9), product and process focus (7), and integration-based considerations (3). In terms of *students' side considerations* they suggested some points that should be aimed by researchers or implementers of digital storytelling in classroom settings. According to some experts, researchers/implementers of digital storytelling should make students explore themselves (4), keep their originality (3), increase their participation (1) and make them feel special (1). On the other hand, in terms of *product and process focus* experts suggested researchers to decide how to operate digital storytelling process (6), whether it will be product-oriented, process-oriented or both.

> ["…I can say that process is important according to me. If only we guide learners truly or provide guidance about how to reach correct information or product throughout the process, we can see that the outcomes are much more different. Therefore, part of process or product oriented is so important"
> "…bizim için benim adıma önemli olan aslında o süreçtir. O süreç kısmında biz öğrenciye doğru yönlendirmeleri yaptığımız takdirde onun doğru bilgiyi ya da doğru ürüne nasıl ulaşılabilecek kısmında doğru rehberliği verdiğimiz takdirde çıktılarının çok daha farklı olduğunu görüyoruz. O yüzden süreç ya da sonuç odaklı, ürün odaklı kısmı çok önemli" (P2)
>
> "Actually, both of them [process and product] should be considered. Namely, the aim should be neither creating a product or make students to live the process per se. Both of them should be evaluated and outcomes of them should be compared. Because some things can not be revealed with other ways"
> "Aslında bu süreci ikisini birlikte düşünmek gerekiyor. Yani sadece ürün oluşturmak değil bence ya da sadece o süreci yaşatmak değil. İkisinin hem değerlendirilmesi, çıktılarının da bu anlamda karşılaştırılması gerekiyor. Çünkü diğer türlü birtakım şeyler ortaya çıkamayabiliyor" (P2)]
>
> ["Researchers should not consider digital storytelling as a tool per se. They should observe the process as well. Because, let's say researchers made an

> interview or observation at the beginning and at the end of the process, this is not enough. You should make observations perpetual. In other words, if one person shows a behavior or a skill, what is the reason behind this?"
> "Araştırmacılar sadece dijital hikayeyi araç olarak ele almamalı. Süreci de çok iyi gözlemlemeli.Süreci de dikkate almalı. Çünkü, [ee] yani başında ve diyelim sonunda görüşmeler yaptın, gözlemler yaptın bu yeterli değil yani. Sen gözlemlerini sürekli ele almalısın. Yani bir kişi bir beceriyi gösteriyorsa veya bir davranışı gösteriyorsa, ya bunun altındaki yatan sebep ne?" (P3)]

On the other hand, in terms of *integration-based considerations* they suggested to think how to integrate digital storytelling into education (1), design student-centered education (1), and to use digital storytelling in interdisciplinary approach (1).

4.2.4.2. Research Questions and Variables for Digital storytelling Studies

Field experts were asked about what should be the research questions and which variables or constructs should be investigated in digital storytelling studies. Responses given to these questions were coded together since participants focused on variables/constructs while thinking of research questions. Results were provided in Table 4.21 below;

As seen from the Table 4.21 below, experts more frequently addressed on *skills* (23) to be queried in digital storytelling studies. Among these skills, they emphasized problem solving skills (7), critical thinking skills (6), ICT skills (4), language skills (3), social communication skills (1), listening skills (1), writing skills (1), comprehension skills (1), and literacy skills (1). Furthermore, field experts emphasized *self-regulation* (6) variable to be investigated in digital storytelling studies. They referred self-efficacy (2), self-awareness (1), self-evaluation (1), self-inquiry (1), and self-reflection (1) in terms of self-regulation. Participants also stated that research questions can change according to context of the study, in other words it depends on research problems of the study, setting of the study (rural/urban area), classroom environment, literature gap, and aim of the study. All of these contextual issues coded as *contextual* (6). They also referred *experience* (5), *achievement* (4), *creativity* (4), *attitudes* (3), *engagement/participation* (3), *inclusive education* (3), *sharing* (3), and

product evaluation (3) to be queried in research questions. According to some experts *process-based questions* (2) should be used in digital storytelling studies. Furthermore, some experts focused on *topic selection* (2) for digital story creation while expressing ideas about what should be the research questions. They implied that topics with which students have difficulty should be selected. They also stated that researchers should focus on *learning strategies* (2) while determining their research questions. On the other hand, according to some of them, research questions should be *learning-based* (2), in other words they should focus on measuring learning dimension through digital storytelling. Besides, some experts addressed on *digital literacy* (2), *motivation* (2), and *social aspects* (2) to be queried in digital storytelling studies. Some other research questions or variables suggested to be queried are collaboration, online presence, investigate the individual case, feedback (giving/receiving), use of technological tools, how to use digital storytelling, problem-based learning, co-creativeness, make sense of digital stories, reasons for non-participation, not to use 'effect', importance of story, emotional dimension, contribution to learning, mental process analysis, adult education, change in behavior, concept conflict, culture, decision making, exploring new content, identity, individual development, learning outcomes, learning transfer, memory, psychological aspects, reception, and visual literacy (*f*=1 for each). Some exemplary statements were provided below;

> ["I think self-efficacy is a really important research question that should be asked of students who create digital stories."
> "Bence öz-yeterlilik gerçekten dijital hikaye oluşturan öğrencilere sorulması gereken önemli bir araştırma sorusu" (P12)]

> ["In addition, stories themselves. Although we associate digital storytelling to digital at the end, story creation phase is also more important. If story creation phase is not completed well, digital part is also affected by this and it does not comes."
> "Birde hikayelerin kendisi. Evet her ne kadar dijital hikaye sonu dijitale bağlıyorsak da hikaye aşaması da çok önemli. Çünkü zaten hikaye aşaması doğru oturmadığı takdirde dijital kısmı gelmiyor." (P2)]

> ["Concept conflict can be investigated for example, and it attracts attention because the attention is not given to concept conflict when digital stories

are created. Since digital stories are product-oriented, teachers or students can create a product that involves more concept conflicts. It [DST] can be used to determine concept conflicts also."
"Kavram yanılgılarına bakılabilir mesela o da çok ilgi çekici çünkü hazırlarken dikkat edilmiyor ama dijital öykülerin çok bence hani bir ürüne yönelik olduğu için kavram yanılgılarını da çok güzel aslında içeren bir ürün oluşturabiliyor öğretmen adayları ya da öğrenciler. Hani kavram yanılgılarını belirlemede de hani bir şey olarak kullanılabilir" (P11)]

Table 4.21. *Research Questions and Variables for Digital Storytelling Studies*

Research Questions	**Frequency**
skills	23
contextual	6
self-regulation	6
experience	5
achievement	4
creativity	4
attitudes	3
engagement/participation	3
inclusive education	3
product evaluation	3
sharing	3
digital literacy	2
learning based	2
learning strategies	2
motivation	2
process-based questions	2
social aspects	2
topic selection for DST	2
adult education	1
change in behavior	1
co-creativeness	1
collaboration	1
concept conflict	1
contribution to learning	1
culture	1
decision making	1
emotional dimension	1
exploring new content	1
feedback (giving/receiving)	1
how to use DST	1

identity	1
importance of story	1
individual development	1
investigate the individual case	1
learning outcomes	1
learning transfer	1
make sense of DST	1
memory	1
mental process analysis	1
not to use 'effect'	1
online presence	1
problem-based learning	1
psychological aspects	1
reasons for non participation	1
reception	1
use of technological tools	1
visual literacy	1

Findings related to research questions and variables/constructs needed to be investigated in digital storytelling research studies were also presented in Figure 4.18 below.

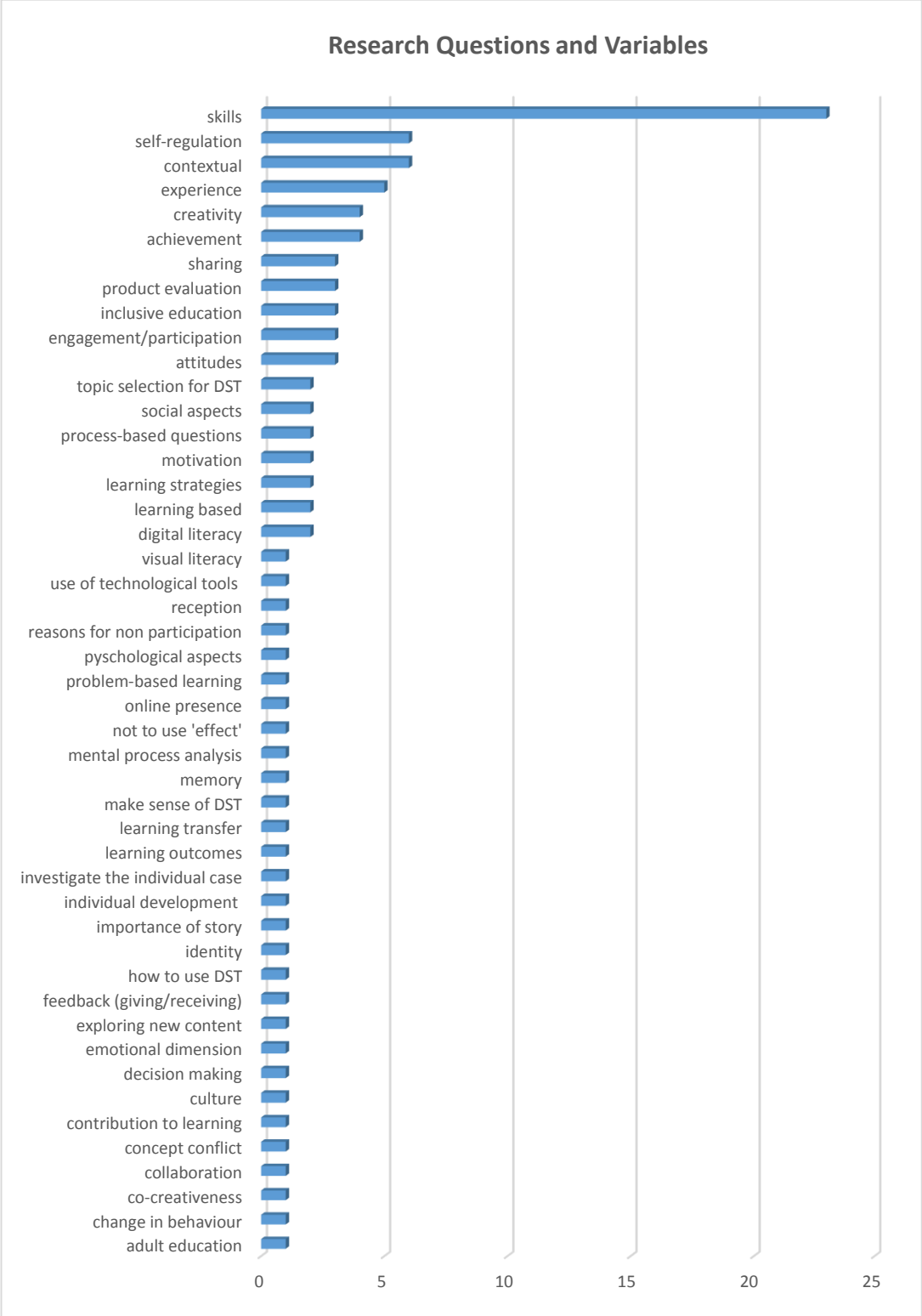

Figure 4.18. Research Questions and Variables for Digital Storytelling Studies

4.2.5. Research Paradigm for Digital Storytelling

Field experts asked about which research methodologies and data collection methods can be used in digital storytelling studies. Responses to these questions were coded and thematized separately as research methodology and data collections methods.

4.2.5.1. Research Methodology for Digital storytelling Studies

Participants' suggestions for research methodology preference in digital storytelling studies were grouped into 4 main themes as *qualitative*, *quantitative*, *mixed* and *developmental*. Results were provided in Table 4.22 below.

As seen from Table 4.22 below, participants more frequently suggested *experimental research methodology* (13) for digital storytelling studies. Secondly more suggested research methodology is *mixed-method* (10). Furthermore, they suggested to use *case study* (8) and *ethnography* (8) as a research methodology for digital storytelling studies. In addition to these, *phenomenology* (4), *action research* (3) and *meta-analysis* (2) were also suggested by some field experts to use in digital storytelling studies. Some other research methodologies that should be preferred by researchers for digital storytelling studies are *narrative inquiry*, *discourse analysis*, *grounded theory*, *delphi*, *survey* and *developmental research* (*f*=1 for each). On the other hand, some field experts did not provide any suggestions for research methodology and claimed that research methodology can be change according to research questions of the study. Therefore, according to them, it's hard to suggest any research methodology without defining/examining research questions of the study. All of these statements were coded as *determined by research questions* (7).

Table 4.22. *Research Methods for Digital Storytelling Studies*

Type	Methodology	Frequency
Qualitative	Case Study	8
	Ethnography	8
	Phenomenology	4
	Action Research	3
	Narrative Inquiry	1

	Discourse Analysis	1
	Grounded Theory	1
	Delphi	1
Quantitative	Experimental	13
	Meta-Analysis	2
	Survey	1
Mixed	Mixed-Method	10
Developmental	Developmental Research	1

Findings in terms of research methodology that can be used in digital storytelling studies were also presented in Figure 4.19 below.

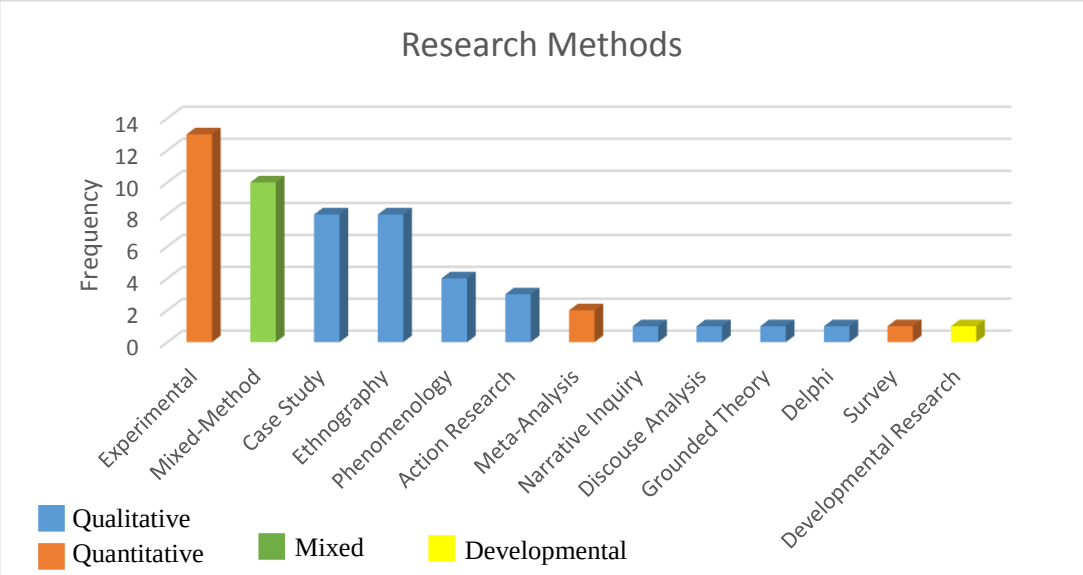

Figure 4.19. Research Methods for Digital Storytelling Studies

4.2.5.2. Data Collection Methods for Digital storytelling Studies

Participants' suggestions for data collection method use in digital storytelling studies were grouped into 2 main themes as qualitative and quantitative. Results were provided in Table 4.23 below.

As seen from Table 4.23 below, field experts more frequently suggested *interview* (11) and *observation* (8) method for data collection in digital storytelling studies. Secondly

more suggested methods for data collection were *achievement test* (7) and *scales* (6). Furthermore, some experts also suggested to collect data by using *focus group discussions* (3) and *questionnaire* (2). Other suggested data collection methods were *field notes*, *student diaries*, *video records*, *individual portfolios*, *reports* and *evaluation rubrics* (*f*=1 for each). In addition to all of these, according to some experts, selection of data collection methods *depends on the research questions* (8).

Table 4.23. *Data Collection Methods for Digital Storytelling Studies*

Type	**Methods**	**Frequency**
Qualitative	Interview	11
	Observation	8
	Focus Group Discussions	3
	Field Notes	1
	Student Diaries	1
	Video Records	1
	Individual Portfolios	1
	Reports	1
Quantitative	Achievement Test	7
	Scales	6
	Questionnaire	2
	Evaluation Rubrics	1

Information about data collection method that can be used in digital storytelling studies was also presented in Figure 4.20 below.

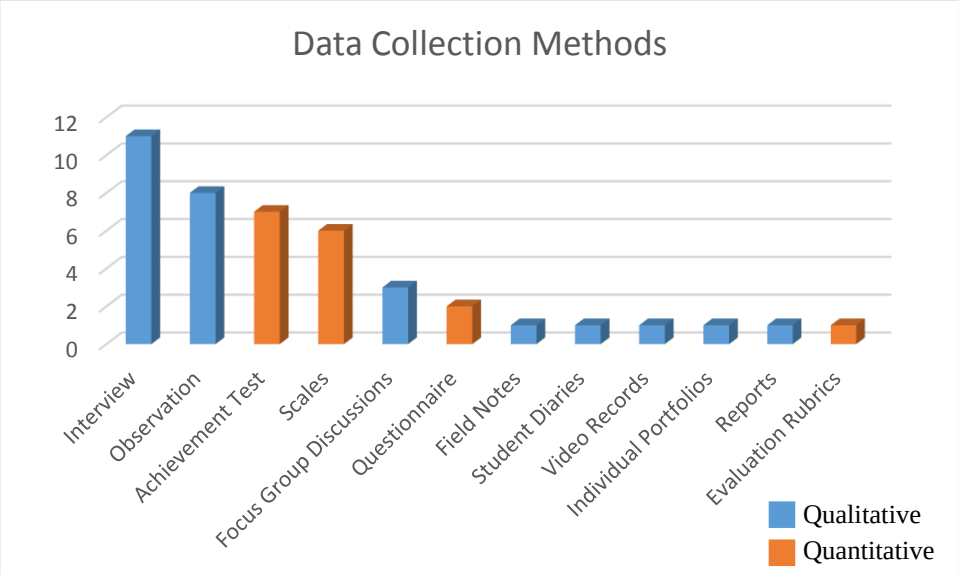

Figure 4.20. Data Collection Methods for Digital Storytelling Studies

4.2.6. Theoretical and/or Conceptual Bases for Digital Storytelling

Opinions of filed experts about theoretical and conceptual bases for digital storytelling studies obtained by posing some questions. In this context, they were asked about which theories can guide digital storytelling studies, whether 7 steps that were determined by Center for Digital Storytelling are considered by researchers and their importance, importance of digital storytelling creation phases/steps defined by Robin, and their opinion about what should be considered while implementing/integrating digital storytelling. Findings obtained from participants' responses to all of these questions were presented here with 4 sub-headings namely, Theoretical Foundations for Digital Storytelling Studies, Importance of 7-steps for Digital Storytelling Studies, Importance of 4-step Approach for Creation of a Digital Story and Additional Points for Digital Storytelling Process.

4.2.6.1. Theoretical Foundations for Digital storytelling Studies

Participants were asked about which theories can best fit digital storytelling studies for guiding. Responses given to this question were analyzed and result were provided in

6 main themes namely, Constructivism/Constructionism, Instructional Approaches and Models, Media and Communication Theories, Pedagogical Theories, Cognitivism and Adult Learning Theory as provided in Table 4.24 below.

Table 4.24 below shows that filed experts mostly focused on **constructivism/constructionism (35)** while proposing theoretical bases for digital storytelling studies. Among constructivism, they emphasized constructivism (22), social constructivism (7), situated cognition (3), constructionism (2) and experiential learning theory (1). They also suggest to use **instructional approaches and models (12)** for digital storytelling studies which are namely, collaborative learning (5), project-based learning (2), active learning (2), T-Pack (1), life-long learning (1), and student-centered instruction (1). Furthermore, some field experts focused more on **media and communicational theories (7)** as media theory (2), new literacy theory (1), narrative studies (1), uses and gratifications theory (1), diffusion of innovation theory (1) and new media studies (1). Besides, some of them stated **cognitivism (6)** as a theoretical base for digital storytelling studies. **Pedagogical theories (3)** were also proposed by some experts namely pedagogical principles (1), critical pedagogy (1), and feminist pedagogy (1). In addition to these, **adult learning theory (1)** was also proposed as theoretical base. It's worth the state here that some experts did not provided any specific theory suggestions for the base of digital storytelling studies, instead, they stated that determining theoretical base for digital storytelling studies depends on the target group and the topic selected for the study, aim of the study, statement of the problem, and perspective of researcher. All of these statements grouped under the theme of **contextual (5)** that was presented in Table 4.24 below. Some remarkable statements were also provided below.

> ["Constructivist. Constructivist theories and collaborative learning theories or approaches can be used and these theories are in center of digital story, digital storytelling because students creates themselves. They are trying to reach information with their own ways. I think, the process of digital storytelling should be managed by integrating these theories especially collaborative learning and constructivist approach"

"Yapılandırmacı. Bir defa yapılandırmacı ve işbirlikli kuramlar öğrenme yaklaşımları kullanarak ki zaten dijital hikayenin, hikayelemenin merkezinde o var, çünkü öğrenci kendisi oluşturuyor. Kendisi bilgiye ulaşmanın yollarını deniyor. Bence bu özellikle işbirlikli ve [ee] yapılandırmacı eğitim yaklaşımının, bu kuramların bu sürece dahil edilip, sürecin bu şekilde yürütülmesini düşünüyorum ben" (P2)]

["…when constructivism or student-centered approach is discussed, when students reveal their uniqueness or the process of constructing knowledge emerges, we can see that digital storytelling best fits them"
"…yapılandırmacılık tartışıldığında, işte öğrenci merkezli anlayış tartışıldığında, öğrencinin özgünlüğünü ortaya koyması, bilgisini yapılandırması süreci ortaya çıktığında işte dijital hikayelerin bunun için aslında biçilmez bir kaftan olduğunu görüyoruz" (P8)]

"…storytelling itself, if instructor states that he/she has students created digital story in classroom environment, students need to create a story about given topic individually or in a group work. In that process, they need to find or create visuals for the story. After that, they need to make their stories digital by integrating their found visuals and their captured voices. This process is the process in which students are active themselves, therefore, it [DST] can be associated with constructivism."
"…öykülemenin kendisi eğer öğrenciye hazırlattım diyorsa [eğitmen] sınıf ortamında, öğrencinin tek başına ya da grup halinde kendine verilen konuyla ilgili bir öykü oluşturması gerekiyor. O süreç içerisinde oluşturduğu öykü işte görseller oluşturmasıydı, görseller bulması gerekiyor. Daha sonrada kendi sesleriyle ve buldukları görsellerle onu dijitalleştirmesi gerekiyor. Bu süreç tamamen öğrencinin kendisinin aktif olduğu bir süreç olduğu için hani daha çok yapılandırmacılıkla hani nitelendirilebilir." (P11)]

Table 4.24. *Theoretical Foundations for Digital Storytelling Studies*

Theme	**Sub-themes**	**Frequency**
Constructivism/Constructionism	Constructivism	22
	Social Constructivism	7
	Situated Cognition	3
	Constructionism	2
	Experiential Learning Theory	1
Instructional Approaches and Models	Collaborative Learning	5
	Project-based learning	2
	Active Learning	2
	T-PACK	1
	Life-long Learning	1

	Student-centered Instruction	1
Media and Communicational Theories	Media Theory	2
	New Literacy Theory	1
	Narrative Studies	1
	Uses and Gratifications Theory	1
	Diffusion of Innovation Theory	1
	New Media Studies	1
Cognitivism		6
Pedagogical Theories	Pedagogical Principles	1
	Critical Pedagogy	1
	Feminist Pedagogy	1
Adult Learning Theory		1
Contextual		5

4.2.6.2. Importance of 7-elements for Digital Storytelling Studies

Participants were posed a question of whether 7-elements defined by Center for Digital Storytelling (CDS) were considered by researchers of digital storytelling studies and their importance. Findings obtained from the analysis of given responses to this question were categorized into 4 themes namely essentials, ignorance of 7-elements, implementational suggestions, and implementation of 7 elements and provided in Table 4.25 below.

As seen from the Table 4.25 below, field experts stated that 7-elements for digital storytelling is **essential (22)** for digital storytelling studies. According to them, these elements are cornerstone for digital storytelling process. Some field experts emphasized specific elements among them namely, *storyboard* (2), *economy* (2), *dramatic question* (2), *story circle* (1), and *emotion* (1). Some remarkable statements about essentiality of these elements were provided below;

> ["I can say that in order to manage these [DST] studies, in other words, creation of digital stories whether they are created by students or instructors, whoever creates them, they need to follow these steps in order to keep entirety.
> "Şöyle söyleyim bu çalışmaların bir bütün içerisinde yürütülmesi için yani dijital hikayelerin üretiminde gerek öğrencilerin ya da gerek öğretmenlerin

her kim üretiyorsa bunu o bütünlüğü sağlayabilmeleri için bence çok önemli bu adımların takibi" (P6)]

["I think that these elements should be considered in each digital story creation. Because, you can see that digital stories which involves these elements are really meaningful"
"Her dijital öyküde bu unsurlara dikkat edilmesi gerektiğini ben düşünüyorum. Çünkü gerçekten bu elementleri taşıyan dijital öykülerin anlamlı olduğunu görüyorsunuz zaten" (P11)]

Field experts also stated their opinions about the **ignorance of 7 elements (7)** in digital storytelling studies by researchers. Great majority of field experts stated that these elements were ignored (7) by researchers in digital storytelling studies. On the other hand one expert stated that these elements were mentioned theoretically but they are not implemented practically in digital storytelling studies. Some exemplary statements provided below;

["I don't think that these 7 elements are known or followed by developers"
"Ben o 7 özelliğin çok da developer'lar tarafından bilindiğini ya da takip edildiğini zannetmiyorum. (P1)]

["Although researcher states that these elements should be considered, we can see that these elements are not considered in implementation process. They can skip them in implementation process although they stated them in literature part. Unfortunately, we cannot see these elements in all research studies."
"Yani şöyle kişi çalışmasında bu unsurları dikkate alın desede uygulama sürecinde çok dikkate almadığını görüyoruz genelde. Yani uygulama sürecinde biraz bunu atlıyorlar evet tamam literatürde alanyazında veriyorlar genelde ama maalesef ki bu unsurları tüm çalışmalarda göremiyoruz yani."(P3)]

Field experts also provided some **implemantational suggestions (9)** regarding to these 7-elements. They emphasized mainly on *providing flexibility* (7) among these 7-elements. In other words, they claimed that digital story creators should move forward or backward among these 7-elements and they don't need to follow these elements in order. For instance, according to them, students can change the story by turning back to this phase even if they moved to another step. On the other hand, according to some experts, there is a *need for training* (2) of digital story creators before they start to

develop their digital stories. Furthermore, some experts stated that there is a *need for procedural guidance* (2) for these elements, in other words, these elements should be explained in detail in order to be comprehended by students. One field expert stated that goals should be determined before starting creation of a digital story and students should ask themselves what they try to achieve with that digital story. Furthermore, some field experts provided their opinions about **implementation of these 7 elements (3)** and stated that these *7 elements are considered* (3) by researchers of digital storytelling studies. Some statements were provided below;

> ["In my examined studies whether they are articles or dissertations, I have seen that these 7 steps were considered. In other words, I have seen that these steps were considered one by one and researchers try to conduct a research study according to these steps"
> "Benim incelediğim çalışmalara makale çalışmaları olsun, tez çalışmaları olsun, bu 7 aşamaya çok dikkat edildiğini gördüm ben. Yani o basamakların tek tek ele alındığını ve o basamaklara göre çalışma yapılmaya çalışıldığını gördüm (P6)]
>
> "I can see that these elements are considered in general manner because if you look at the process of a creation of a story … they are implemented. Since, if the aim is to tell something in a story, if we consider this as an aim, there is no possible way to tell a story without thinking of these 7-elements."
> "Genel manada alınıyor olarak görüyorum çünkü sonuçta işte bir hikayenin oluşturulma sürecine baktığınızda … uygulanıyor yani. Çünkü eğer hikayede amaç bir şeyleri anlatmaksa ki bu amaç olarak değerlendirdiğimizde burdaki 7 kıstası genel manada dikkate almadan hikaye anlatmakta çok mümkün değil" (P10)]

Table 4.25. *7-steps for Digital Storytelling Studies*

Theme	**Sub-themes**	**Frequency**
Essentials	Storyboard	2
	Economy	2
	Dramatic Question	2
	Story Circle	1
	Emotion	1
Ignorance of 7 steps	Ignorance of 7 steps	7
	theoretically yes but practically no	1
Implementational Suggestions	Providing Flexibility	4

	Need Training	2
	Needs for Procedural Guidance	2
	Determining Goals for DST Creation	1
Implementation of 7 steps	7steps are considered	3

4.2.6.3. Importance of 4-step Approach for Creation of a Digital Story

Participants were asked about the importance and contributions of 4-step approach defined by Robin for creation of a digital story. Their responses were grouped into 3 themes namely as benefits, essentials for digital story creation, and suggestions which were presented in Table 4.26 below.

Table 4.26 below shows that field experts frequently mentions its **benefits (12)** and they emphasized mostly on *good guideline* (9), *working* (2), and *easing development process* (1). They claimed that this 4-step approach is required to be followed in order to make digital storytelling process proceed healthy and make development process easy. Some remarkable statements were provided below.

> ["Digital storytelling workshop proceeds in a pre-determined order. Therefore, it's important to follow a specific steps. Deciding what to tell in digital story, defining topic, organizing what to tell in story circle, selecting visual that will be used in digital story, doing a voice capturing and writing it, so we see that all of these steps are related to each other.
> "dijital hikaye anlatımı atölyesi belirli bir sırada yürüyen bir şey. O nedenle bir aşamaya doğru, aşamalandırmanın takip edilmesi önemli. İşte ilk önce dijital hikayede neyin anlatılacağına karar vermen, topic belirlemen, hikaye çemberinde konuşacağını bilmen hani bunlarla başlayan işte senin dijital hikayende kullanacağın görselini seçmen, ses kaydını yapman bunu yazıya dökmen. Aslında bu aşamaların hepsinin birbiri ile alakalı olduğunu görüyoruz" (P3)]
>
> ["…following the steps is more important. Steps starting from storyboarding to sharing process, sharing the stories are although described with different names, everyone used same steps at the end."
> "…aşamaların takibi çok önemli yani storyboard'la başlayıp paylaşım sürecine kadar giden yani hikayelerin paylaşım sürecine kadar giden aşamalar her ne kadar farklı adlandırılsa da aşağı yukarı herkes aynı aşamalardan geçmiş oluyor zaten" (P6)]

> ["When the process proceeds step-by-step, students know what to do clearly. Instructors know what to do and you are controlled from the beginning."
> "Bu adım adım gittiği zaman öğrenciler daha net ne yapacaklarını biliyorlar. Öğretmen ne yapacağını biliyor ve … baştan kontrollü oluyorsunuz." (P11)]

Furthermore, field experts stated that this 4-step approach is **essential for digital story creation (8)** and they specifically put emphasis on some of it steps as voiceover session (1), sharing with peers (1), and importance of topic selection (1). Within the scope of this theme, experts stated that following of these steps are required and each step possesses its importance. On the other hand, some experts provided **suggestions (5)** regarding to these steps and claimed that these steps *need to be developed* (4) for making implementers to comprehend them better and digital story creators should have an opportunity of *flexible use of these steps* (1). Some statements are below.

> ["I think that steps are needed to be developed because for example let's say voiceover. Voiceover session defines the most explicit steps fundamentally. It's important in this context but it's needed to be separated into sub-factors, sub-structures and there is a need for detailed explanation for them…within this context according to me they [4-steps] needs to be separated into sub-steps and to be detailed. If specific structure revealed as a result of this detailing process, instructors can see the process clearly during implementation and as a result of this it can provide easiness."
> "Aşamaların geliştirilmesi gerektiğini düşünüyorum ben çünkü mesela seslendirme diyelim. Seslendirme aşaması temeldeki en belirgin aşamaları belirlemiş bu bağlamda önemli ama bunlarda alt yapıları, alt faktörlere ayrılıp onların da teferruatlı bir şekilde gösterilmiş olması gerekiyor…bu bağlamda bence onlar [4 aşama] alt basamaklara ayrılıp detaylandırılmalı ve o detaylandırmayla bir yapı ortaya konulursa uygulama aşamasında öğretmenlerde süreci daha net göreceği için daha kolaylıklar sağlayabilir" (P9)]

Furthermore, according to some field experts, decision of following 4-step approach during creation of a digital story depends on the **context (4)** and they might not fit to context of some specific digital storytelling workshops. Using these steps is definitely depends on the researchers' perspective and how they ground their research.

Table 4.26. *4-step Approach for Digital Story Creation*

Theme	Sub-themes	Frequency
Benefits	Good Guideline	9
	Working	2
	Easing Development Process	1
Essentials for Digital Story Creation	Voiceover Session	1
	Sharing with Peers	1
	Importance of Topic Selection	1
Suggestions	Needs to be Developed	4
	Flexible Use of Steps	1
Contextual		4

4.2.6.4. Additional Points for Digital Storytelling Process

Field experts were asked about whether they can propose or add additional points that should be considered in digital storytelling process apart from 7 elements of CDS and 4-step approach by Robin. Their responses were grouped in to 3 main themes namely, process-oriented considerations, instructors' side considerations and technological considerations as presented in Table 4.27 below.

As seen from the Table 4.27, field experts proposed some **process-oriented considerations (21)**. In this context they suggested researchers/implementers of digital storytelling to give *importance on story not digital* (5) part of the process and *importance on storyboard* (1) because they think that digitalizing the story is not as important as creating a story, even it's possible to tell a story with a single picture according to them. An exemplary statement is below.

> ["It does not matter how good a student is with technology, and how pretty they can make a story look you know on the computer, if it's not a significant well-told, well-constructed story, it doesn't matter what it looks like or sounds like."
> "Öğrencinin teknoloji konusunda iyi olup olmadığı, hikayeyi teknolojiyi kullanarak nasıl güzel yapabildiği önemli değil, eğer hikaye önemli ölçüde iyi anlatılmazsa, iyi bir yapıya oturtulmazsa hikayenin nasıl göründüğü neye benzediği bir önem teşkil etmez." (P12)]

Some experts claimed that there is *no need for storyboard* (2) in some context especially for younger students by reason of time consuming and exhausting. Beside, some experts put emphasis on again *flexibility of transition among steps* (2), *respectively use of steps* (1), *following steps* (1), and *importance of 7-steps* (2) while they were providing their opinion about additional considerations.

> ["During implementation, importance should be given to order of the steps. However, there is no need to be too strict also. Person can be able to move back and add/delete something in his/her story or let's say he/she has selected visual for his/her story, in the next phases there should not be a strict idea that prohibits him/her to use a different visual from his/her selected visual at the beginning. There should be a process in which people can move backward if they want. There need to be a process that proceeds in order but at the same time it should also make people to move backward when they need"
> "Uygulama yaparken de bunun [adımların] sırasına dikkat edilmeli bence. Ama şöyleki, hani çokta katı olunmamalı. İşte kişi sonra geriye dönüp yazdığı hikayede bir şeyi ekleyip çıkarabilmeli veya kişi görseli seçti daha sonraki aşamada hani bu seçtiği görselden başka görsel kullanmasın gibi katı düşünce olmamalı. Hani geri dönen de bir süreç olmalı. Sırayla ilerleyebilen ama gerektiği zaman geriye dönebilen bir yapı olmalı." (P3)]

Yet another additional suggestion for digital storytelling process for the researchers/implementer of digital storytelling is to *give importance to co-creativeness* (2) and *interactions among people* (1) during the whole process.

> ["Co-creativeness. We trigger them to ask themselves rather than to ask us. What visual shoul I put here? What should fit here? We enable them to interact with themselves."
> "Birlikte üretim. Bizden çok birbirlerine sormalarını tetikliyoruz biz. Ya buraya hangi görseli koyayım? Buraya ne olur? Birbirleri ile etkileşime girmelerini sağlıyoruz." (P13)]

Furthermore, some experts put emphasis on *making people externalize their narratives* (1), *reflecting emotions with voiceover* (1), *encouraging participants* (1), and *copyright issue* (1). Some statements were provided below.

> ["According to me, one of the most important points is voiceover of the story by reflecting the emotions. Providing voiceover with your emotions has great effect on transferring your life to there [story]"

> "Bana göre en önemli noktalardan bir tanesi gerçekten duygularını da yansıtarak seslendirebilmek olayı. Çünkü oradaki senin duygularınla birlikte o seslendirmeyi verebilmenin etkisi yüksek yaşantını gerçekten oraya aktarabilmek" (P10)]

Field experts also provided **instructors' side considerations (15)**. In this context they suggested that there is a *need for in-service training* (4) of instructors who integrate digital storytelling into their lessons.

> ["According to my own idea, digital storytelling need to be explained with both theoretical explanations and showing examples. After that, workshops should be held on according to determined schedule with students or teachers whoever it's worked. In other words, there is a need for giving an educational seminar and after this seminar people can switch to teach their digital storytelling process easily."
> "Bunun [DHA] gerek kuramsal yani teorik anlatımı gerekirse örneklerle gösterilmesi gerekiyor benim şahsi fikrim. Daha sonradan da öğrencilerle veyahut işte öğretmenlerle çalışılacaksa da öğretmenlerle belirli bir program dahilinde bunların bir workshopları yapılması lazım. Yani bir eğitim semineri yapılması gerekiyor ki o eğitim seminerinden sonra bireylerin artık rahatlıkla kendi dijital hikayelerini öğretme aşamasına geçmeleri gerekiyor." (P6)]

Furthermore, some field experts stated *important role of facilitators* (2) as *giving importance to experience not topic* (1), *having a clear mind* (1), *being ready for every condition* (1), *considering class context* (1) and *student properties* (1), and *not to intervene students in process* (1).

> ["… In digital storytelling approach there is no way to say that this topic will be told or stories will be told in a length which I want. There is a need of an intention to listen to experience because people are going to tell their lives to you, especially adults"
> "…hikaye anlatalım yaklaşımını ben yani konu bu olsun, bu kadar olsun, benim istediğim kadarı anlatılsın diye bir şey yok. Deneyim ve o deneyimi dinlemeye dair bir niyet gerekiyor. Çünkü insanlar sana hayatlarını açacaklar. Özellikle yetişkinler." (P13)]

> ["One of the most considerable things that should be paid attention during implementing digital storytelling process in practical or in a research is to consider students properties and class context. In other words, situation of a class to which you will implement digital storytelling and student properties should be considered by researchers or instructors, I think."

> "Dijital hikayeleme sürecini uygularken pratik anlamda ya da araştırırken en çok dikkat edilmesi gereken şeylerden birinin öğrenci özellikleri ve context olduğunu düşünüyorum yani sınıfın durumu. Yani o yöntemi uygulayacağınız sınıfın durumu ve öğrenci özelliklerinin özellikle dikkat edilmesi hem araştırmacı için hem de öğretmen için hani bakılması dikkat edilmesi gereken bir unsur olduğunu düşünüyorum" (P11)]

Yet another additional points suggested by some experts to researchers/instructors is to comprehend *philosophical background* (1) of digital storytelling and *media theory* (1). According to one expert *experience of facilitators* (1) is also important to healthy implementation of digital storytelling process. In the context of **technological considerations (2)**, field expert suggested to *improve technological infrastructure* (1) and realizing the *importance of technology* (1).

Table 4.27. *Additional Points for Digital Storytelling Process*

Theme	**Sub-themes**	**Frequency**
Process-Oriented Considerations	importance of story not digital	5
	no need for storyboard	2
	flexibility of transitions among steps	2
	importance of 7 steps	2
	give importance to co-creativeness	2
	copyright issue	1
	respectively use of steps	1
	reflecting emotions with voiceover	1
	interactions among people	1
	encourage participants	1
	importance of storyboard	1
	following steps	1
	make people externalize their narratives	1
Instructors' Side Considerations	need for in-service training	4
	important role of facilitators	2
	media theory	1
	philosophical background	1
	not to intervene students in process	1
	student properties	1
	class context	1
	experience of facilitators	1
	being ready for every condition	1
	having a clear mind	1

	give importance to experience not topic	1
Technological Considerations	improve technological infrastructure	1
	importance of technology	1

Findings of additional points suggested by field experts during implementation of digital storytelling process were also presented in Figure 4.21 below. Blue bars show process-oriented considerations, orange ones show instructors' side considerations and green ones show technological considerations.

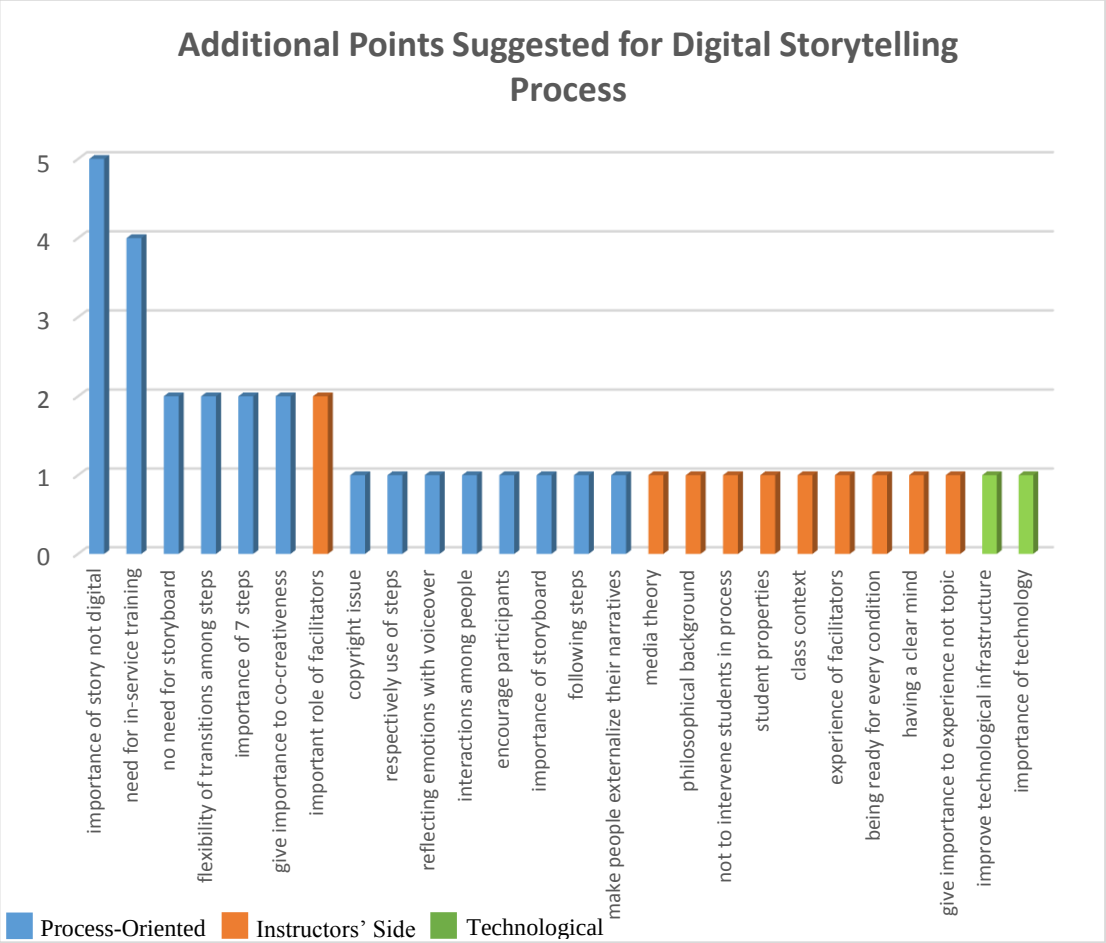

Figure 4.21. Additional Points for Digital Storytelling Process

4.2.7. Future Expectations/Implications of Digital Storytelling

Field experts were asked about how digital storytelling is effected by technological developments and the future of the digital storytelling. Responses were analyzed and presented here with 2 sub-headings namely, Effect of Technological Developments on Digital Storytelling and Future Expectations of Digital Storytelling.

4.2.7.1. Effect of Technological Developments on Digital Storytelling

Experts were posed a question of how digital storytelling is effected by technological developments. Findings obtained from the analysis of responses to this question grouped into 2 main themes namely, facilitation and technological diversity as provided in Table 4.28 below.

Table 4.28 below shows that according to field experts technological developments provide some **facilitations (27)**. In the context of facilitations, field experts claimed that *technology provides opportunities* (9) for digital storytelling.

> ["Now, people can create their stories and share them on Facebook, Instagram or YouTube. Therefore, digital storytelling approach is a part of life, I think. I interpret like this. Because, we are familiar with so many technologies and reveal many products related to us or related to things we know and now there are platforms through which we can share them with people all over the world."
> "Şu an insanlar kendi hikayelerini oluşturup ne bileyim bir instagram da bir faceebook'ta bile paylaşabiliyorlar, bir youtube'da paylaşabiliyorlar. Dolayısıyla aslında dijital hikaye anlatımı ya da dijital öyküleme yaklaşımı hayatın bir parçası gibi bence, ben öyle değerlendiriyorum. Çünkü çok fazla dijital materyalle haşır neşiriz ve kendimizle ilgili ya da kendi bildiklerimizle ilgili çok fazla ürün ortaya koyup bunu dünyadaki birçok insanla paylaşabileceğimiz platformlar var şuan için." (P8)]

Furthermore, some field experts stated that *technology lessens developmental load* (8) for digital story creation.

> ["In the past, video editing programs were available and they were increasing developmental load. They were not complex but loaded. That developmental load decreased so much now, this provide following advantage. Instructors have a time for design of the story through which

> they can be creative rather than spending more time for developmental issues. Advantage of technology is this."
> "Eskiden daha böyle video editing programları biraz daha yükü fazlaydı. Zor değildi ama yükü fazlaydı. O yük şimdi çok azaldı bu da şöyle bir avantaj sağlıyor. Hocalar, şeyle vakit geçireceklerine development'ta çok vakit harcayacaklarına design'da hikayenin design'ında daha yaratıcı olabilecekleri daha çok zamana kavuştular diye düşünüyorum ben. Teknolojinin avantajı o oldu bence." (P1)]

> ["In the past, we were managing the process by teaching professional tools or programs to people for editing a photo but now they can do it with online free editors/tools. Actually, it [technology] eases the process."
> "Eskiden işte bir fotoğrafı işlemeye dair olan birtakım şeyleri daha profesyonel programları öğreterek insanlara yaptırırken şimdi online free editörlerle yaptırıyorsun. Aslında kolaylaşıyor." (P13)]

Yet another claim made by some field experts is that technology make *digital storytelling process popular* (4). According to them technology or digital part of the story attract attention of people.

> ["Digital story is starting to be more attractive comparing to normal story. Perhaps the term of digital at the beginning in other words, it draws people from the community it stands. Digital storytelling becomes more popular with the development of technology."
> "Dijital hikaye hani normal hikayeye göre sanki biraz daha ilgi çekici olmaya başlıyor. Başındaki belki dijitalden dolayı yani bulunduğu toplumu içerisine çekiyor. Biraz daha popüler hale getiriyor teknolojinin gelişmesi ile birlikte." (P3)]

According to some field experts it's *easy to access technology* (4) by the help of technological developments.

> ["A major issue now is that anyone can find technology that will allow them to create digital story very easily. And so, the technology that's needed is more accessible, less expansive and in some cases, the some other tools are free and they're available to too many more people."
> "Şu an ana konu herkesin kolaylıkla dijital hikayelerini oluşturmalarını sağalayacak teknolojileri bulabilmesi. Gerekli olan teknoloji kolay ulaşılabilir, daha az pahalı ve bazı durumlarda bazı araçlar ücretsiz ve birçok kişinin ulaşımına açık" (P12)]

Some participants claimed that digital storytelling takes new form with the *new technology adoption* (2).

> [I think that people experience stories which will be created by living. What I mean is that for example, while you are presenting your story with the virtual reality environment, when you say that a girl walks on the street, suddenly virtual reality environment will come out and you will see virtual appearing of a girl walking on the street or you will see the situation which you will describe in your story"
> "Ben ilerde hani yaşantı ile oluşturduğunuz öykülerin hani deneyimleneceğini düşünüyorum. Ne demek istiyorum örneğin sanal gerçeklik ortamında işte siz hikayeyi bize sunarken örnek veriyorum bir kız çocuğu yolda yürürken diyor birden bir ortam çıkacak işte bir kız çocuğunu işte yolda yürürken oluşturulan görüntüyü göreceksiniz ya da işte sizin tarif ettiğiniz ortamı göreceksiniz." (P11)]

Furthermore, field experts also mentioned **technological diversity (25)** while describing the effect of technological developments on digital storytelling process. Under this main theme they emphasized *mobile technologies* (8), *convenience of technology* (6), *online tools* (5), *social media* (4) and *diversity among tools* (1). Some remarkable statements were provided below.

> ["Each person having a smart phone or a tablet can create their digital story in several minutes. Why? Because these tools involve camera, voice capture system and application for creating a digital story"
> "Yani her birey şuan bir akıllı telefonu olan her birey ya da bir tableti olan her birey dakikalar içerisinde dijital hikayesini kendi dijital hikayesini oluşturabiliyor. Yani neden çünkü bu cihazlarda kamera var ses kayıt sistemi var bu cihazlarda dijital hikaye oluşturacak uygulamalar mevcut."
>
> "…if you have internet connection you can share your story with not only 3 or 5 people, but also thousands, millions of people over social media platforms like YouTube. There is no limited audience for watching your created digital story now. You can reach them to vast audience and in a several days thousands perhaps millions of people can watch your digital story"
> "…internet bağlantınız varsa bunu aynı anda 3 kişi 5 kişi değil, binlerce, milyonlarca insana ulaştırmanız mümkün Youtube gibi ya da sosyal medya platformları üzerinden. Oluşturduğunuz dijital hikayenin sınırlı bir izleyicisi artık yok. Çok geniş kitlelere bunu ulaştırabiliyorsunuz ve birkaç gün içerisinde binlerce belki milyonlarca kişi sizin hikayenizi izleyebilir hale geliyor." (P8)]

["Technology changes so much, virtual reality environments, wearable technologies, sensing and living the environment etc. I think that why not the digital story merged with these technological changes in the future." "Teknoloji çok değişiyor işte ne bileyim sanal gerçeklik ortamları oluyor ondan sonra hani giyilebilir teknolojilerle işte o ortamı hissetme, yaşama durumları vesaireleri yani hani teknolojinin bu moduyla hikayeleme neden birleştirilmesin diye düşünüyorum ilerde çok ilerde." (P11)]

Table 4.28. Effect of *Technological Developments*

Theme	Sub-themes	Frequency
Facilitation	Technology Provides Opportunities	9
	Technology Lessens Developmental Load	8
	Technology Makes DST Popular	4
	Easy to Access Technology	4
	New Technology Adoption	2
Technological Diversity	Mobile Technologies	8
	Convenience of Technology	6
	Online Tools	5
	Social Media	4
	Diversity Among Tools	1

4.2.7.2. Future Expectations of Digital Storytelling

Field experts lastly asked about how popularity of digital storytelling is and how the future of digital storytelling will be. Therefore, their opinions were obtained for not only present condition of digital storytelling but also future prediction or expectation of digital storytelling. Responses were analyzed and presented in 4 main themes namely, future research/implementation guess, increase in popularity, not well-known enough and needs which were shown in Table 4.29 below.

Table 4.29 below shows that field experts provided some **future research/implementation guess (17)** for digital storytelling. In this context they emphasized that *digital storytelling will continue to be used* (6), *the distinction between what is digital storytelling is or what is not will be more clear* (3), digital storytelling will *be used in different areas* (2) and *grade levels* (1), *technological barriers will have reduced* (1) for implementation/integration of digital storytelling, it

will *be used/worked in different disciplines* (1) and *with different tools* (1), it will *be inspected with different aspects* (1) and its future *depends on the design of the study* (1). Some remarkable statements were provided below.

> ["Storytelling exists from the beginning of the humankind. Therefore it will exist only if humankind will exist. So, it may come out with different name different than digital storytelling in the future. It may change by depending on technology but storytelling will exist perpetually according to me."
> "Yani öykü anlatımı, hikaye anlatımı insanoğlu var olduğu günden beri var. Dolayısıyla insanoğlu var olduğu sürece de olacaktır. Dolayısıyla gelecekte de bu dijital hikayeleme olmaz da başka bir hikayeleme biçimi olarak karşınıza çıkabilir. Teknolojiye bağlı olarak yine değişebilir ama sürekli hikaye anlatımı var olacaktır diye ben düşünüyorum" (P8)]

> ["For all the time it's not matter whether it is storytelling or digital storytelling, with different technologies, their role on educational goals achievement will never change."
> "Her zaman için düz hikaye yöntemi de olsa, dijital öyküleme, hikayeleme yöntemi de olsa farklı teknolojilerle birlikte bunların eğitimle bizim kazanımlarımızı kazandırmadaki rolü hiçbir zaman değişmeyecek." (P11)]

> ["I think that hopefully in the future it will be maybe, it will be easier to tell what a digital story is and what isn't."
> "Bence gelecekte öyle umut ediyorum ki dijital hikaye anlatımının ne olup ne olmadığını anlatmak kolay olacak." (P12)]

> ["I think that it will project to different areas. In the beginning it was being used in communication field. Now, we have started to use it in education field. In the future, I think it will be used in different areas and will improve."
> "Farklı alanlara da yansıyacağını düşünüyorum. İletişim alanında ilk başta kullanılıyordu. Şimdi eğitim alanında kullanmaya başladık. Daha sonrasında farklı farklı alanlarda kullanılacağını ve gelişeceğini düşünüyorum." (P3)]

Furthermore, field experts also emphasized on **increase in popularity (10)** of digital storytelling. According to them digital storytelling *will become popular* (10) with the help of diffusion of technology and online sharing opportunities. Some statements were provided below.

> ["I think it [DST] will be more popular in the future. YouTube makes the biggest contribution on this. Currently, this new generation's tendency of

using YouTube is too high. Therefore, digital stories become more popular since tendency of using YouTube is too high. And in the future, I'm sure that instructors will use digital stories more. I feel like this."
"Bence gelecekte daha fazla yer bulacak. Bunda da en büyük katkıyı YouTube yapıyor. Şimdi bu yeni nesilin YouTube'u kullanmaya olan eğilimi çok yüksek. Öyle de olunca, YouTube'u kullanma eğilimi çok yüksek olunca dijital hikayeler kendine daha fazla yer buluyor ya. Ve ilerde de öğretmenler eminim daha fazla kullanacaklar dijital hikayeleri. Ben öyle hissediyorum." (P1)]

["I think digital story will become more popular in the future and people both students or non-students will create their own stories bravely and share them easily in their own web-page or in channels/blogs they created. Besides, I believe that digital storytelling will diffused easily in almost each grade level of education."
"Gelecekte ben dijital hikayenin daha da çok yaygın olacağını, insanların gerek öğrencilerin gerekse dışardaki insanların kendi hikayelerini daha cesurca daha rahat kendi sayfalarında ya da oluşturacakları bir kanalda rahatlıkla paylaşacaklarını ve eğitimin hemen hemen her kademesine çok rahatlıkla yayılacağına inanıyorum ben." (P6)]

On the other hand, according to some field experts digital storytelling is still **not well-known enough (7).** They claim that it should be more popularized especially in education. The reason for non-popularity is that it's only used in scientific research according to them. Some exemplary statements provided below.

["Is it [DST] well-known? Perhaps in terms of its specific features, criteria or principles it may not be well-known. It seems like that digital storytelling compressed in research studies."
"Çok biliniyor mu? belki spesifik bir özellikleri açısından, belki bir takım kriterler ve ilkeler açısından çok bilinmiyor olabilir. Yani bir araştırma, araştırmalara sıkışmış bir şey gibi duruyor" (P8)]

["No, it's [DST] not popular. I think not, why not? Because it's not a part of teacher education programs. Digital storytelling is not told as an instructional method to teacher candidates in pre-service teacher education programs. It's more of an issue of instructional technology courses. Actually, there should be a chapter for this method. Chapter for instructional method."
"Yok değil. Şimdi bence değil, niye değil? Çünkü bu öğretmen eğitimi programlarının bir parçası değil. Ya sen, pre-service'te öğretmen eğitirken, dijital hikaye bir öğretim yöntemi olarak anlatılmıyor ki insanlara. Ya da gösterilmiyor ki. Daha çok bu öğretim teknolojisi derslerinin konusu.

Aslında bu yöntemin konusu olması lazım. Öğretim yönteminin konusu." (P1)]

Lastly, field experts provided some **needs (5)** regarding to future of digital storytelling. According to them, digital storytelling should be integrated more in education in general and in pre-service teacher education specially.

["…It's [DST] popularity should be increased somehow. Therefore, I'm proponent of its integration to the K-12 education somehow whether unit-based or lesson-based or integrating pre-prepared materials for this purpose into lesson. For example, at the end of specific unit or lesson pre-prepared digital stories can be given to students or shown to them"
"…popülerliğini kesinlikle bir şekilde artırması gerekiyor. O yüzden aslında bir şekilde dijital hikayenin ben K-12 eğitimine de entegre edilmesi, ya da ünite bazında ya da ne bileyim dersler bazında kullanıldığında bu anlamda farklı materyallerde hazırlanıp, hazır materyallerinde derse bir şekilde entegre edilmesi taraftarıyım mesela, atıyorum belli bir ünitenin belli bir konunun sonunda daha önce hazırlanmış şeyler, dijital hikayeler sınıf ortamında öğrencilere verilebilir, gösterilebilir." (P2)]

["…actually technology enters into class but how will we combine this entering technology into class with instructional methods and approaches? Digital storytelling can just ensure this"
"…aslında teknoloji şuan sınıfa giriyor ama bu sınıfa giren teknolojiyi yöntemle, metodla, yaklaşımla nasıl birleştireceğiz? İşte dijital hikayeleme yaklaşımı bunu sağlayabilir." (P8)]

Table 4.29. *Present and Future Condition of Digital Storytelling*

Theme	**Sub-themes**	**Frequency**
Future Research/Implementation Guess	WillCcontinue to be Used	6
	the Distinction Between What is DST or What is not DST	3
	to be Used in Different Areas	2
	Technological Barriers Will Have Reduced	1
	to be Used in Different Grade Levels	1
	Depending on Design of the Study	1
	to be Worked in Different Disciplines	1
	to be Worked With Different Tools	1
	to be Inspected With Different Aspects	1
Increase in Popularity	Will Become Popular	16

Not well-known enough		13
Needs	Need for More DST Integration	3
	Integration to Pre-Service Teacher Education	2

4.3. Summary of the Findings

This section gives summary of the findings obtained from both parts of the study and compares them one by one. These key findings can be seen in Figure 4.22 (meta-synthesis part) and Figure 4.23 (field experts) below (Table 4.1 and Table 4.13 above respectively). In terms of *theoretical base*, it's revealed that scholars of analyzed digital storytelling research studies used constructivism, multiliteracies pedagogy and new literacy theory more frequently as a guide for their study. Whereas, field experts frequently suggested to use constructivism, cognitivism and collaborative learning as theoretical base for digital storytelling research studies. If these findings obtained from publications and field experts compared, it's seen that constructivism is the only overlapping theory between them. Field experts proposed to use cognitivism and collaborative learning differently from scholars of analyzed publications as a guiding theoretical bases for digital storytelling studies.

In terms of *purpose of studies*, analyzed digital storytelling publications revealed out that scholars more frequently aimed to investigate achievement change, ICT use and language use in digital storytelling studies. Whereas, field experts suggested researchers to conduct study that measures efficiency of digital storytelling in learning environments, conduct experimental studies and make in-depth investigation of whole digital storytelling process. These results showed that field experts focused on the way of conducting digital storytelling studies instead of proposing measurement of some constructs or variables comparing to findings of first part of the study.

Regarding to *research problems* of studies, it's found that scholars of digital storytelling publications more frequently use achievement, opinions and ICT use while defining research problems. Whereas, field experts proposed to use skills, self-

regulation and experience for defining research problems for digital storytelling studies. If these findings compared, it's seen that overlapping construct used for defining research problems is ICT use since it's a kind of skill which was suggested by field experts. On the other hand, field experts suggested to define research problems that investigate self-regulation and experience of students.

In terms of *research methodology*, it's revealed out that quasi experimental and mixed-method are more frequently used research methodologies in analyzed digital storytelling publications. In addition, it's crucial to state that some research studies did not clearly report research methodology used for the study. This is a deficiency that should be considered by future researchers while conducting digital storytelling studies. Whereas, field experts frequently proposed to select experimental, mixed-method, and ethnography for research methodology in digital storytelling studies. When these findings are compared, it's seen that overlapping research methodologies are experimental and mixed-method. As well as these methodologies can be considered by future researchers, ethnography which is proposed by field experts differently from publications can be conducted for directing digital storytelling studies.

Regarding to *subjects* involved in digital storytelling studies, it's found that grade 6-8, grade 1-5 and grade 9-12 are more frequently preferred target groups in analyzed publications. Whereas, field experts frequently suggested to involve all age groups, pre-school age and grade 6-8 for digital storytelling studies. When these findings are compared, it's seen that overlapping target group selection is grade 6-8. Field experts focused much on using digital storytelling in all age groups and specifically pre-school grade level.

For *data collection* methods, it's revealed out that interview, scales and learner artifacts are more frequently used instruments in digital storytelling publications. Whereas, field experts frequently suggested to use interview, observation and achievement test for data collection in digital storytelling studies. These findings showed that overlapping data collection method is an interview between opinions of

field experts and findings of analyzed digital storytelling publications. On the other hand, field experts suggested to use observation and achievement tests for data collection methods differently from scholars of publications.

Inferential statistics, thematic coding/analysis and descriptive statistics/analysis are more frequently *data analysis* methods by scholars of analyzed digital storytelling publications. Analysis of *findings* section of digital storytelling publications revealed out that digital storytelling is effective for increasing achievement, empowering technical/ICT skills and improving motivation. *Conceptual frameworks* or *bases* used by analyzed digital storytelling studies were Lambert's (2010) 7 elements for digital storytelling, Robin's (2008) 4-step approach for creating effective digital story and Kearney's (2011) 4 phases for digital story creation.

In terms of *subject areas*, field experts frequently suggested to integrate digital storytelling into science courses, language education and social science courses. Regarding *field* for implementation of digital storytelling, field experts frequently proposed to integrate digital storytelling into every field and specially communication and health. It's needed to state the difference between subject areas and fields here. Subject area corresponds domain of knowledge in education field, whereas field corresponds an implementation area such as health, communication, arts, and military. Field experts stated that *technological developments* provides opportunities for students, lessens developmental load and facilitates use of mobile technologies for creation of digital storytelling. Last but not least, field experts provided their opinions about *the future of digital storytelling* and stated that digital storytelling will become popular, is not well-known enough yet, and continues to be sued in future.

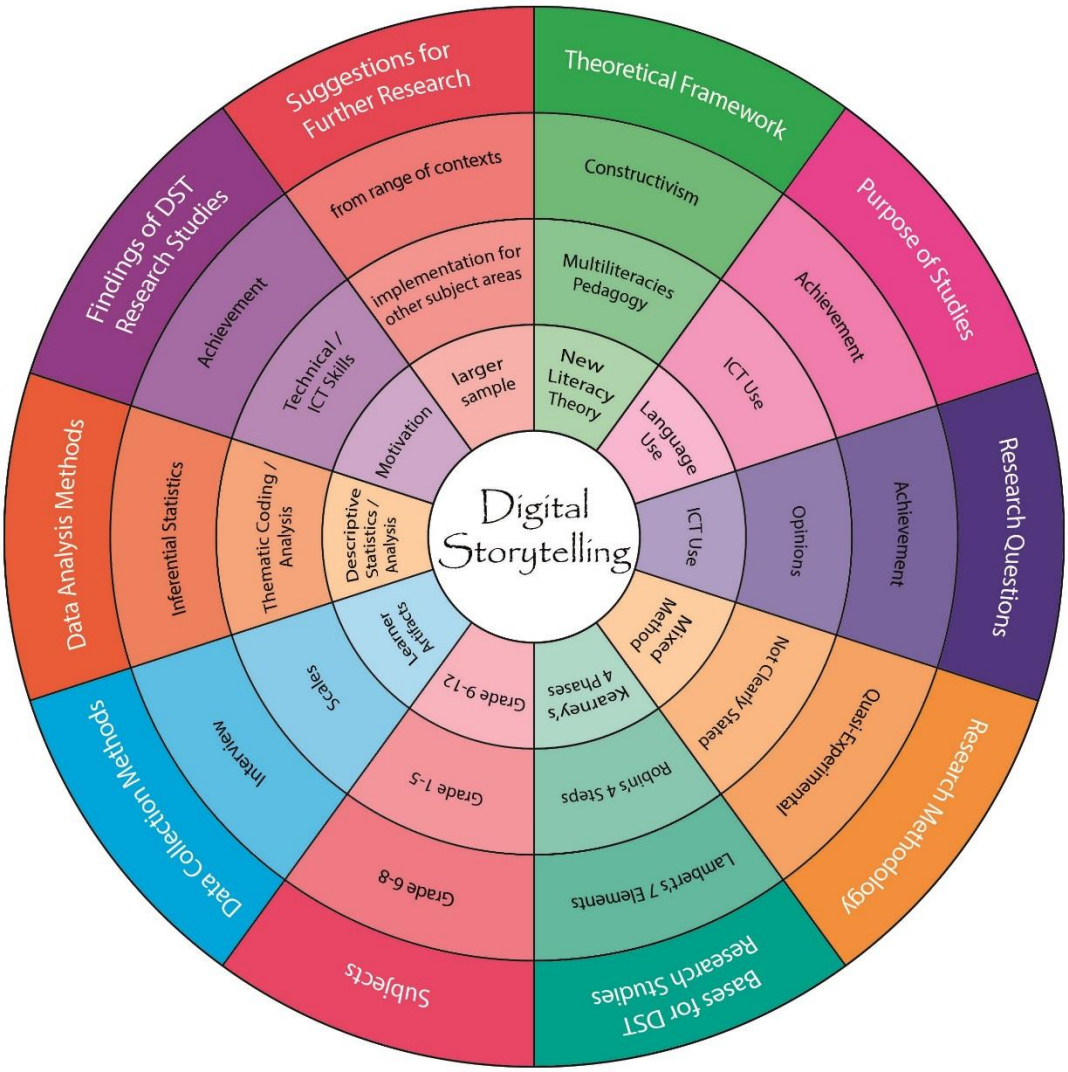

Figure 4.22. Summary of the Findings Revealed from Meta-synthesis of Digital Storytelling Research Studies

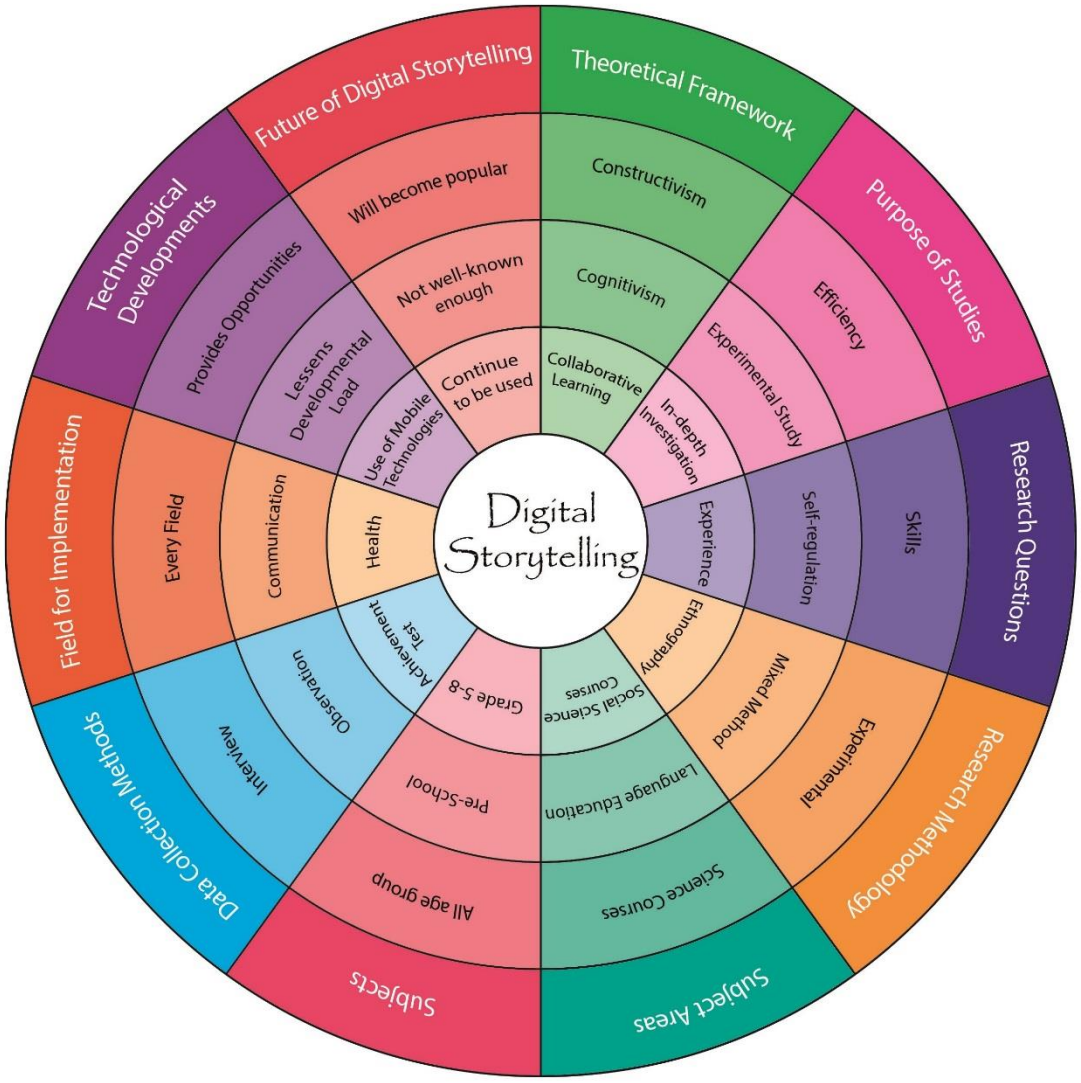

Figure 4.23. Summary of the Findings Revealed from Expert Interviews

CHAPTER 5

DISCUSSION AND CONLUSION

In this chapter, the discussion and conclusion of the findings on the both meta-synthesis and expert opinions sections were provided comparatively in the light of main themes extracted from the data analysis first, and then implications for practice and further research were provided.

5.1. Discussion of the Findings

5.1.1. Definition of Digital Storytelling

Digital storytelling was defined by field experts by emphasizing its various features as being around a theme, being told in a pattern, co-creative production, uniqueness of stories, reflecting emotions and ideas, personally narrating of stories, sharing enabler structure and etc. In addition to these features, they put emphasis on some issues that makes digital storytelling more valuable such as prioritizing personal voice and narratives rather than use of technologies for digitalizing stories. Herein, the importance of story comes out which was remarked by some field experts. According to some of field experts, the word ‘digital’ should not make a difference for the way of telling any kind of story since the storytelling is in the core of the process. The researcher agrees with this claim which puts emphasis on the creation of a story or the act of storytelling rather than equipping it with technological aids. According to the researcher, as storytelling is the ancient way of telling experiences for humankind, it should continue to stay in the center of digital storytelling process as well. This means that enthusiasm of using digital tools or technologies should not get ahead of the act of storytelling and its core requirements (e.g. storyboarding, characters and personal voice). In other words, allocating enough time for creation of a story must be

considered by implementers of digital storytelling. It's undeniable fact that technological facilities not only eases the development process but also provides opportunity of reflecting emotions and transmitting the story to a large amount of audiences. However, all of these technological opportunities should not sidetrack the telling a story.

Another important point worth to state here is that digital storytelling should be conceptualized as a process or a method rather than a tool. According to some field experts, it's wrong to conceptualize digital storytelling as a tool since technology is not in the center rather it's a way of forming storytelling with an aesthetical appearance. However, in some of the analyzed digital storytelling studies it's defined as a tool or a vehicle (Baki, & Feyzioğlu, 2017; Pieterse, & Quilling, 2018; Ozturk, & Tunc, 2017; Nam, 2016) which are wrong terms to define digital storytelling process according to field experts and the researcher as well. Therefore, digital storytelling should be considered as a process or a method instead of a tool. In addition, it can also be stated that technology comes into play at the end of a story creation. Firstly, story should be revealed out by performing its core requirements and then digitalizing procedure should be employed. According to researcher who critically analyzed publications within the scope of the study and expert interviews, digital storytelling can be defined as a process through which storytellers experience the act of storytelling within some rules, express their emotions and ideas, learn various things during whole process (story script writing, narrating and visualizing) and reveal out a user-generated short digital video (3-5 minutes long) by using multiple modes of technology (image, music, voice record and photos).

5.1.2. Theoretical Base for Digital Storytelling Studies

Findings obtained from the analysis of theoretical bases used in digital storytelling studies revealed that scholars more frequently used *constructivism* as a theoretical base in their studies. This result also coincides with the expert opinions as they more frequently suggested to use constructivism as a theoretical base for digital storytelling

research studies. The reason for this might be digital storytelling process itself since storytellers construct their own knowledge through researching, telling, and creating a digital story. This rationale verifies Svinicki's (2010) definition of constructivsm which is "…the learner "constructs" his or her understanding of the environment from his or her interactions with it rather than the environment creating new stimulus-response connections" (p.74). Being parallel with the process of learning through interacting with environment during creation of a digital story, Hung, Hwang, and Huang (2012) also remarked knowledge construction and interaction by stating that "knowledge is actively constructed in by individual minds and formed by interaction with the environment" (p.370). Main idea lies behind the constructivism which is individual construction of knowledge through interacting with the environment is labeled or briefly stated by (Phillips, 1995) as "human the creators versus nature the instructor" (p. 7). As is also understood from this expression, learners are knowledge creators and the environment they are exposed to is instructor and this statement overlaps with the nature of digital story creation process as storytellers construct/create their individual knowledge through interacting with the environment within each phase of the process. Furthermore, students can also construct their own knowledge by comprehending related concepts in the course of writing a script or narration in digital storytelling process by making some research and obtaining information from various sources such as using information technologies, visiting libraries, or just interviewing with people holding information about their story content like in the study conducted by Silseth (2013). This process is parallel to claim made by Duffy et al. (2012) about important characteristic of constructivism which is learners' building their own interpretation of the world depending on experience and interaction and generating a new understanding through the collection of knowledge from various sources (as cited in; Smeda, Dakich, & Sharda, 2014, p.5). Learning through creation of a story in a constructivist environment is also emphasized by Behmer (2005) as "storytelling is a process where students personalize what they learn and construct their own meaning and knowledge from the stories they hear and tell" (p.4). Due to all

of these reasons and characteristics, as seen from the related publications and opinions of field experts, constructivism can be used as a theoretical base for digital storytelling research studies or its implementation in classroom settings.

Under constructivism, scholars used some theories/approaches namely as social constructivism, student-centered learning approach, situated cognition theory, situated learning theory, symbolic instructionism, cognitive apprenticeship, community of learners/practice, constructionism, inquiry-based learning, active learning, reflective-thinking and self-directed learning. When these constructivist theories/approaches were compared to findings of expert opinions, it's seen that some of these theories also overlap with the suggestions of experts. Overlapping constructivist theories/approaches are *social constructivism, situated cognition*, *student-centered learning*, and *constructionism*.

The reason for proposing *social constructivism* under the roof of constructivism might be that digital storytelling is a social process through which learners construct knowledge by interacting with others as well. According to Lave and Wenger (1991) learning is an integral and inextricable aspect of social practice. Besides, students learn through the support/guidance of others (e.g. more experienced peers) to achieve something which they cannot do by themselves (Rogoff, 2003; Vygotsky, 1978 as cited in; Fokides, 2016). Throughout the process of digital story creation students share their ideas and knowledge about from selection of materials (images, photos, titles and etc.) to using specific technologies (digital storytelling creation software, video cameras, software for drawing an image or making a voice capture). This sharing behavior of students leads peer learning which occurs naturally during peer interactions especially when they encounter different ideas from their own and through peer conflict (Piaget, 1997 as cited in; Fokides, 2016). Furthermore, at the end of the process they share/showcase their digital stories with their peers and receive/give feedback from/to them in an interactional environment. According to Maier and Fisher (2007) students prone to reflect on or state their positions not only on an issue of

themselves but also those of their peers by observing the decision process behind their peers' choice. Therefore, interactions among students during or end of the digital storytelling process make them construct their knowledge together as a product of socialization. For this reason, social constructivism might be used as a theoretical base under the roof of constructivism in digital storytelling research studies.

On the other hand, the reason for use/suggestion of *student-centered learning* (i.e. self-directed learning) approach might be that students manage their learning process and make their own decisions throughout creation of a digital story. Definition of self-directed learning says that "self-directed learning is a process in which individuals take the initiative with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating outcomes" (Knowles, 1975, p.2). Digital storytelling process provides completely this environment stated in Knowles's (1975) definition of self-directed learning by enabling learners to manage process with their own way and decisions. For instance, they make decisions about images/photos to add into their digital stories or about how to voiceover story script, title of the story, textual length of the story etc. Therefore, both related publications and field experts indicate student-centered learning or in other saying self-directed learning as a base for digital storytelling just because the property of self-management of whole process through which students determine their own needs and interest (Silen & Uhlin, 2008).

Among constructivist theories/approaches, *constructionism* might have been suggested/used for the reason of creating a product/artifact (a digital story) termed by Seymour Papert, founder of constructionism, as "public entities" (Kretchmar, 2015) at the end of the process which is the key point that discriminates constructionism from constructivism although they are in the same roof and have some similarities. Furthermore, Kafai and Resnick (1996) remark learning through creation of individualized products by stating "constructionism suggest that learners are

particularly likely to make new ideas when they are actively engaged in making some type of artifact – be it a robot, a poem, a sand castle, or a computer program – which they can reflect upon and share with others" (p.1). Digital storytelling as seen from the related publications and directions of the field experts is a process of learning through actively creating a personal product. Therefore, constructionism can be used as a theoretical base for digital storytelling process/research as storytellers have their digital product at the end.

Situated cognition or in other saying situated learning (involving cognitive apprenticeship) was both used by scholars and suggested by field experts as a theoretical base and the underlying reason for this might be main principle of the theory which upholds learning as a situated practice by being in a part a product or activity (Brown, Collins, & Duguid, 1989; Lave, & Wenger,1991). According to Stein (1998), "learning is essentially a matter of creating meaning from the real activities of daily living" and the term situated means involving other learners, the environment, and the activities to create meaning (para. 2). Digital storytelling process is an activity of creating a product and storytellers learns throughout this process with the involvement of other learners as well, due to this reason it matches with situated cognition theory.

Unlike analyzed digital storytelling publications, field experts also suggested to use *experiential learning theory* as a theoretical base for digital storytelling studies under the roof of constructivism. According to Kolb (1984), "learning is the process whereby knowledge is created through the transformation of experience" (p. 38). Since students or storytellers concretely experienced the digital story creation process individually and share their experiences with their peers, they transform experience which is the fundamental principle for knowledge creation in learning process defined by Kolb (1984). Thus, experiential learning theory can also be used for the base of digital storytelling studies.

In addition to constructivist theories/approaches, scholars of analyzed digital storytelling studies used more frequently multi-literacy pedagogy and new literacy theory for conducting their research. This result also coincides with the expert opinions in some way as some of experts proposed to use *new literacy theory* as a theoretical base. The reason for proposing of a new literacy theory as a theoretical base for digital storytelling studies might be that digital storytelling process involves multiple literacies as information literacy, technology literacy etc. instead of solely based on print literacy. Papadopoulou & Vlachos (2014) remark foundation of new literacy by making a comparison with traditional literacy as "Traditionally, the literacy model is that of 'one medium, one mode, and one language' defined from a print-based world, a world of two dimensions: print and images. However, literacy definition has undergone a dramatic change brought by the rapid advancements in the world and especially the technological development." (p.239). From this statement, it's understood that advancements in technological developments and as a result of this, use of ICTs in daily lives changed the nature of literacy and new literacy types emerged. Leo et al. (2004) emphasize this change by stating that "new literacies go beyond foundational literacies to include new reading, writing, viewing and communication skills required by the many new ICTs that continue to appear in our lives" (as cited in; Papadopoulou & Vlachos, 2014, p.240). Digital storytelling provides students with opportunity of using different kind of technologies and media, hence it can be directly associated with new literacy theory as analysis of related digital storytelling publications and field experts opinions indicate the same.

Furthermore, field experts suggested some instructional theories or approaches that form the base of digital storytelling studies and guide future digital storytelling studies namely as, *collaborative learning, project-based learning, active learning, T-PACK, life-long learning, cognitivism,* and *adult learning theory*. If all of these newly suggested theoretical bases by field experts are considered one by one, *collaborative learning*, the first one, might be rooted in Lev Vygotsky's concept of learning called zone of proximal development (Aloisi & Scana, 2016) and defined as "…a pedagogy

that has its center the assumption that people make meaning together and that the process enriches and enlarges them" (Matthews, 1996, p.101). Digital storytelling process if implemented as a co-creation of peers especially, is a collaborative learning process per-se. Therefore, collaborative learning approach can be used in digital storytelling implementation/integration process.

On the other hand, *project-based learning* can also be considered as a theoretical base for digital storytelling process since the process ends with a creation of a digital product by individuals or groups within the scope of working on a project over a period of time. In project-based learning students learn through solving significant problems which requires them to produce tangible artifacts showcasing their developing expertise (Blumenfeld et al., 1991; as cited in Vogler et al., 2018). Furthermore, in project-based learning, learners are provided with requirements of desired end product (e.g. creating a digital story) and learning is guided by correcting problems or issues encountered during this process with the guidance of instructors or coaches who provide expert guidance, feedback and suggestions for achieving the final product in better way (Savery, 2006). By thinking all of these statements provided by scholars, it can be claimed that students can learn through solving instant problems they faced during creation of a digital story by taking expert guidance from their instructors or facilitators and this process ends with a creation of tangible artifact, a digital story. Therefore, as field experts suggested, project based learning might be theoretical base for digital storytelling process.

Active learning is defined briefly as anything that "involves students in doing things and thinking about the things they are doing" (Bonwell & Eison, 1991, p. 19). Digital storytelling process provides active learning environment by directly involvement of students in searching relevant information for story content, selecting appropriate images for a story, thinking how to write a story script or make voiceover for a story (e.g. toning script). In other words, digital storytelling process enables students engage in things and think about these things while they are engaging just stated in Bonwell

& Eison's (1991) definition. Therefore, active learning can be preferred as a theoretical base for implementation or integration of digital storytelling.

T-PACK or *Technological, Pedagogical Content Knowledge* is early claimed theoretical base for digital storytelling by Robin (2008), founder of educational use of digital storytelling, and defined by Thompson & Mishra (2007) as "the three kinds of knowledge (Technology, Pedagogy and Content) that we believe are essential building blocks for intelligent technology integration.…These three knowledge domains should not be taken in isolation, but rather that they form an integrated whole, a "Total PACKage" as it were, for helping teachers take advantage of technology to improve student learning" (p. 38). Digital storytelling process provides environment in which students engage in use of technological devices for creation of their digital story, obtaining content knowledge by searching relevant sources for their digital story and completing digital storytelling process in pre-defined pedagogical strategies (individual, peer or group work). Therefore, digital storytelling process encapsulates T-PACK model in use and this model can be selected as a theoretical base for digital storytelling research studies or integration/implementation of digital storytelling in classroom settings.

Life-long learning theory defends that learning should not be limited to time and place to acquire knowledge (school settings) and to apply the acquired knowledge (workplace) instead, it occurs in everywhere and every time as a result of our interactions with other people or the world around us (Fischer, 2000). Therefore, as is evident from its name learning is a process which occurs during a whole life of the individuals. If it's assumed that this learning process managed by the learners, it can be said that this approach is closely related to self-directed learning as well. According to Smeda et al. (2014), enabling students actively engaged in learning process makes them self-directed, lifelong learners in the long run (p.6). By thinking of self-managed learning process and students' instant learning process while doing a search by using various sources in different places (e.g. library for obtaining relevant knowledge for

story or taking photo for the story content outside of the school), it can be claimed that digital storytelling process supports the use of life-long learning theory as a theoretical base.

Cognitivism focuses on how to remember, store, and retrieve information (Smeda et al., 2014) and defines learning as "involving the acquisition or reorganization of the cognitive structures through which humans process and store information" (Good and Brophy, 1990, p.187). For the cognitivists, learning can be explained by inspecting what's going on inside of the brain, consequently, learning is closely related to intelligence and memory which continue developing from birth to adulthood (Khan, 2012). In digital story creation, learning is constantly occurs from the beginning of writing a story script to developing a digital story by using technological aids. Therefore, cognitivism can also be taken as a theoretical base for digital storytelling process.

Lastly, *adult learning theory*, also known as theory of andragogy proposed by Knowles (1970) distinguishes the ways adults learn from the ones children learn and assume that learning process of adults mostly driven by their internal motivation rather than requiring external motivators (Merriam, 2017). Digital storytelling can be implemented/used in target group of adults, for example employees' creation of digital stories about their workplace experience. Therefore, adult learning theory can be considered as theoretical base for this type of digital storytelling implementations.

In addition to instructional theories/approaches, field experts also provided media/communication theories for the base of future digital storytelling research studies as *media theory, narrative studies, uses and gratification theory, diffusion and innovation theory,* and *new media studies*. Furthermore, *critical pedagogy* and *feminist pedagogy* were also suggested by field experts as pedagogical theories for the base of future digital storytelling studies. Therefore, in the light of field experts' suggestions about theoretical bases, future researchers can design their digital storytelling research studies by depending on these suggested theories/approaches.

According to the researcher, by considering suggestions of field experts and meta-synthesis findings, it can be claimed that digital storytelling mainly coincides with the constructivism (self-creation of knowledge), social constructivism (socially learning environment) and constructionism (revealing out a self-created product) as a theoretical base. However, according to the researcher, it can also be associated with the theory of student-centered learning (self-management of process), active learning (actively involvement in process) and project-based learning (developing a project) as well. Unlike analyzed digital storytelling publications and suggestions of field experts, the researcher of the study thinks that *emotional intelligence theory* can also be used in digital storytelling studies since digital storytelling is a process of reflecting and revealing out emotions. Emotional intelligence "concerns the ability to carry out accurate reasoning about emotions and the ability to use emotions and emotional knowledge to enhance thought" (Mayer et al., 2008, p. 511). Feelings are both guiding and directing element of the process and staying actively during whole process at the same time. Therefore, ignoring or insulating emotions during digital storytelling process is impossible and unacceptable. Emotions are evoked during various phases of digital storytelling process such as voiceover session, hearing stories of others and sharing own story with peers. By considering all of the above mentioned rationales, emotional intelligence theory can be used as a theoretical base for digital storytelling studies.

5.1.3. Purpose of Digital Storytelling Studies

When digital storytelling studies were deeply analyzed, it's revealed out that researchers more frequently aimed to investigate the changes in academic achievement of students, their ICT use, language skills, motivation, learning identity, attitude, and collaboration in research studies. While these findings were compared to findings obtained from the expert opinions, it's seen that the overlapping research aims are inspecting *academic achievement, learning outcomes, creativity/creative thinking,* and *21st century skills development* through digital storytelling studies. The reason for

focusing on academic achievement and learning outcomes while defining research aims might be that students or storytellers learn through digital storytelling process. In the literature, there are some studies inspecting academic achievement with respect to digital storytelling, however, most of them focused on language learning such as writing, reading or listening (Batsila & Tsihouridis, 2016; Campbell, 2012; Papadopoulou & Vlachos, 2014; Sarica & Usluel, 2016; Yamaç & Ulusoy, 2016; Yang & Wu, 2012). Only minority of research studies focused on academic achievement in a subject area different than language education such as Kotluk & Kocakaya (2017) inspect academic achievement in Physics course during creation of digital story. Therefore, by considering this and suggestion of field experts, academic achievement can be inspected in other subject areas in addition to language education. On the other hand, since digital story creation process involves 21st century skills use and provides environment for students to show their creativity, both experts and researchers of analyzed studies emphasized on 21st century skills use and creativity while defining research purposes. In the literature, Bogard & Mcmackin (2012) inspects students literacy skills on 21st century writing workshop, however, there is a need for conducting more research studies about 21st century skills.

Unlike research aims revealed from the digital storytelling publications, experts proposed to inspect learners' *social success factors*, *psychological aspects* of digital storytelling process and *making sense of digital storytelling process*. Since the process of digital story creation is a versatile activity, it involves sharing personal experience, sharing ideas with peers, interacting with peers or instructor, reflecting emotions, giving or receiving feedback and co-creation of a product. Therefore, this versatility should be considered by future researchers and it can be used for starting point for the purpose of digital storytelling research studies. In this context, one of the possible purposes of study might be inspecting *psychological side* of the digital story creation process by focusing on what students feel when they share ideas with their peers, what they feel during a whole process from starting to write their story scripts to receiving feedback from their peers at the end of the process. Since students share their personal

experience or sometimes a story they could have not tell somebody else till that time (a story kept in their heart) or a love story which is a milestone in their life, researchers should also focus on how sharing these types of stories effected them or in other words, what they feel just after they shared their stories in digital platform with their class-mates. Briefly, future researchers should focus on inspecting *psychological dimension* of digital storytelling process by revealing out feelings, emotions, reflections and ideas just like as in the study of Liu, Huang, and Xu (2018) which inspects emotional experience of students by focusing on anxiety of speaking foreign language during digital story creation process as an individual vs. group work.

In addition to psychological dimension, researchers should also aimed to investigate *communicational dimension* of the process by conducting discourse analysis, conversation analysis or interaction analysis. Since communication is in the nature of humankind, storytellers also communicate throughout the digital storytelling process with numerous ways by sharing ideas or giving feedback for example. Consequently, communication during a whole process is undeniable fact and for this reason researchers should investigate it with multi-dimensionally. As an example for investigation of communicational dimension, a study conducted for inspecting whether digital storytelling process close the gap between two generations, primary schools children and elderly people can be given (Mouchtari, Meimaris, Gouscos, & Sfyroera, 2015). So, this type of research studies can be conducted in the future for investigating communicational dimension of digital storytelling through empowering interaction/communication or closing the gap between two generations.

Yet another dimension of the process that should be focused by the future researchers is the *co-creativity* which is started to be inspected by scholars recently such as the study of Schmoelz (2018) which investigates enabling co-creativity through digital storytelling process. Developing of a digital story is a co-creative process somehow and this co-creative feature of the process might be used by educational stakeholders in order to design effective instruction for inclusive education through which students

having different nationality learn together. Like the study conducted by Oakley et al. (2018) to inspect cultural exchange between students from different nations through digital storytelling or the study conducted by Stacy & Aguilar (2018) to inspect intergenerational information exchange during co-creation of a digital story, even multi-dimensional study might be designed to inspect different aspects of co-creation process of digital stories in the context of inclusive education or inter-cultural and inter-generational interactions. In addition to all of these, it can be claimed that digital storytelling studies can aim to investigate dimensions of digital storytelling that were not inspected up to know so much such as emotions evoked during the process, the effect of emotions in learning process, how to co-create meanings, challenges faced with in both students' and instructors' side during the process, changes that digital storytelling process makes on learners' or instructors' life and perspective about the act of storytelling. It is also important to state that digital storytelling studies should go beyond the investigation of language acquisition and aim to investigate acquisition of other skills such as communication skills, social skills, researching skills and sharing skills.

5.1.4. Research Problems for Digital Storytelling Studies

Analysis of research problem section of digital storytelling studies revealed out that major issues inspected by scholars are achievement, opinions, ICT use, motivation, attitude, literacy skills, engagement, learning outcomes, and etc. While these inspected issues were compared to experts' suggestions for research problems, it's seen that experts also suggested some similar issues to be inspected in digital storytelling studies. These overlapping issues/topics to be used for defining research problems are *achievement, ICT use, attitude, literacy skills, engagement, product quality, communication skills, collaboration, co-creativity, emotional dimension/experience, online presence,* and *problem solving skills*. It's seen from the findings of both sections that both scholars and field experts focused on skill use, academic achievement, collaboration and engagement while defining research problems for the study. Since

digital storytelling is a process in which numerous skills, especially language and technological skills, are enacted, that's why both scholars of analyzed research studies and field experts focused on skill use. With respect to skill use, unlike scholars of related digital storytelling publications, field experts suggested to define research problems for inspecting *language skills* in future studies. Language skills are composed of four domains as reading, writing, listening and speaking. In the first part of the study (deep analysis of digital storytelling studies), it's seen that scholars mostly focused on reading skills (Batsila & Tsihouridis, 2016; K. P. Liu, Tai, & Liu, 2018; Yang & Wu, 2012) and writing skills (Baki & Feyzioglu, 2017; Batsila & Tsihouridis, 2016; Campbell, 2012; Damavandi, Hassaskhah, & Zafarghandi, 2018; Papadopoulou & Vlachos, 2014; Rubino, Barberis, & Malnati, 2018; Sarica & Usluel, 2016; Yamaç & Ulusoy, 2016) with respect to language skills. Only few studies focused on speaking skills (Bashirnezhad & Yousefi, 2017) and listening skills (Tahriri, Tous, & MovahedFar, 2015). Therefore, it's crucial to focus on listening and speaking skills regarding to language skills while defining research problems for future studies.

Collaboration, co-creativity and communication skills are both used/suggested by scholars of analyzed research studies and field experts. The reason for this is the social structure of digital storytelling process through which students communicate with each other, collaboratively or co-creatively create some elements of digital story or the whole digital story. Therefore, communication and socialization are inevitable elements of digital storytelling process and these constructs should be inspected with different dimensions in future digital storytelling research studies just like in the study which investigates effects of digital storytelling on teamwork and communication skills of high school students (Özturk & Tunç, 2017) and the study which focuses on group talk and collaboration among students (Anderson & Weninger, 2012).

Furthermore, field experts suggested to define research problems through which *sharing, learning strategies, giving/receiving feedback,* and *self-efficacy* are inspected differently from analyzed digital storytelling publications. *Sharing* knowledge or an

experience is fundamental element of digital storytelling process through which students get chance of telling their stories about overcoming anxiety, depression, living with eating disorders, taking transformative trip and dealing with death for example (Yearta, Helf, & Harris, 2018). Furthermore, students can better understand one another and the world by sharing and listening to stories (Cunningham, 2015; Lambert, 2013; Rief, 2016; as cited in Yearta, Helf, & Harris, 2018). Therefore, sharing is the construct that should be inspected in digital storytelling research studies.

Learning strategies is also essential in educational use of digital storytelling and according to Barrett (2005), four student-centered learning strategies are converged and facilitated throughout digital storytelling process as student engagement, reflection for deeper learning, project-based learning and the effective integration of technology into instruction (as cited in Wang & Zhan, 2010, p. 77). In addition, multimodality of digital storytelling process enable students to use their various learning styles such as visual, audio-visual or just audial (Bandi-Rao & Sepp, 2014). Therefore, the experience of learners with different learning styles/strategies might be investigated in digital storytelling studies.

Feedback is inspected differently in digital storytelling literature as receiving participants' feedback about the use of digital storytelling activity in classroom settings or a specific software designed for creation of a digital story. However, as field experts suggested, students' receiving feedback from their instructors/facilitators or giving feedback to their peers throughout the digital story creation process is also worth to be investigated by future researchers. *Self-efficacy* is also a construct that can be investigated multidimensionally in digital storytelling studies such as students' self-efficacy toward learning (Baki & Feyzioglu, 2017; Kotluk & Kocakaya, 2017; Yang & Wu, 2012), self-efficacy toward writing (Yamaç & Ulusoy, 2016), self-efficacy toward technology use or teachers' self-efficacy toward teaching (Pappamihiel, Ousley-Exum, & Ritzhaupt, 2017). Field experts also suggested to focus on whole process and define *process-based research problems*. Within this scope, the evaluation

of whole digital storytelling process from teachers' or students' point of view can be done by future researchers.

Last but not least, field experts suggested to inspect the *reasons for non-participation* of some students into digital storytelling process. Non-participation of students to the process of digital story creation might be multidimensional as it may occur as a result of psychological reasons or lack of technological knowledge or other reasons such as challenges in organizing and writing story and cultural barriers for sharing personal narratives or experiences (Boase 2008; as cited in Robin, 2016). Therefore, the reasons for unwillingness to participate into digital storytelling process should be investigated deeply in further studies. In addition to all of these, according to the researcher, some other aspects that does not come to light should also be inspected by future researchers as *feelings*, *inclusiveness*, *reflections*, *perceptions*, *receptions*, *disagreement among peers*, and *concept conflicts*. In addition to all of these, it can be stated that if language skill acquisition is demanded to be worked, speaking and listening skills should be investigated as these are rarely investigated constructs according to the findings of meta-synthesis part.

5.1.5. Research Methodology for Digital Storytelling Studies

Findings of analysis of digital storytelling studies in terms of research methodology revealed that scholars preferred to use quasi-experimental, mixed method, case study, action research, experimental, ethnography, and narrative inquiry research methodology while designing their studies. Expert interview findings showed that research methodologies suggested by field experts overlapped with some of these methodologies to a large extent as they also proposed to use *experimental, mixed-method, ethnography, action research* and *narrative inquiry*. The reason for use of this research methodologies in analyzed digital storytelling studies and suggestion of field experts at the same time can be explained one by one. For *experimental study*, the reason for using/suggesting might be its opportunity for observing measurable

effects of an intervention (digital storytelling) since these types of studies rely completely on the detection of effects on an intervention (Whalley, 2006).

For *mixed-method study*, the reason for using/suggesting might be comprehensively inspecting or in-depth understanding of issues (Johnson, Onwuegbuzie, & Turner, 2007) related to digital storytelling implementation by using both quantitative and qualitative data collection/analysis methods within the same study (Shorten & Smith, 2017).

For *the ethnography study*, possible reason for using/suggesting might be to see first-hand how storytellers/students interact with technology in their natural environment by direct observation of researcher. Angrosino (2007) defines ethnography as "the art and science of describing a human group – its institutions, interpersonal behaviors, material productions and beliefs" (p. 14). Discriminating property of ethnographic research from other research types is direct observation of people being studied in their natural settings. In digital storytelling process, ethnographic researchers can directly observe students during creation of a digital story for various aims such as observing interactions among them or interactions with specific technologies used for digital story creation. Therefore, ethnographic research can be conducted for digital storytelling process as both analyzed research studies and field expert pointed out.

Action research is another research methodology remarked by field experts and scholars of analyzed digital storytelling research studies for the possible reason of making research by practitioners themselves (e.g. teachers) rather than a professional researcher which makes action research distinctive among other research methodologies (McNiff & Whitehead, 2006). Another distinctive property of action research is being an active researcher rather than a spectator researcher who does not take part in situation being investigated (McNiff & Whitehead, 2006). Because of these distinctive properties, digital storytelling process can be investigated by using action research methodology as suggested by field experts and used in analyzed research studies.

Narrative inquiry is a research method through which human experience is understood and investigated (Clandinin, 2013 as cited in; Haydon, Browne, & van der Riet, 2018) in narrative forms. Digital storytelling process provide storytellers with sharing their personal experiences in narrative form, hence it serves the rationale behind the narrative inquiry research methodology.

Unlike research methodologies preferred by scholars in the analyzed research studies, field experts provided some other research methodologies to be used in digital storytelling studies as *Delphi method, grounded theory, phenomenology, discourse analysis, meta-analysis, survey* and *developmental research*. *Delphi method*, also known as Delphi study, is employed for "facilitating structured group communication in order to gather a consensus of expert opinions in the face of complex problems, expensive endeavors, and uncertain outcomes" (Grime & Wright, 2016, p.1). According to Grime and Wright (2016), the rationale or principle lies behind the Delphi method is "more minds are better than a single mind" (p.1). Delphi method was traditionally used as a forecasting technique by involving a panel of experts specialized in a particular subject area to make a prediction based on their expertise (Olshfski & Joseph, 1991). Unlike its traditional use for forecasting, Delphi method is also used for reaching consensus about specific issues by anonymously taking opinions of field experts through posting surveys by several times (rounds) and employed in education field as well (Al-araibi, Mahrin, & Yusoff, 2019; Blieck et al., 2019; Shortt, Webster, Keegan, Egan, & Brian, 2019). Like these educational studies conducted by various scholars, Delphi method or Delphi study can also be employed in the field of digital storytelling since there is a need for reaching consensus about such as the meaning of digital storytelling, using step-wise approaches for digital storytelling process, its efficiency in educational settings and even students' technology literacy by involving field experts specialized in digital storytelling.

Grounded theory can be used as both data collection/analysis method or a research methodology per se and serves a purpose of investigating actualities in the real world

without depending on preconceived hypothesis (Allen, 2006). Grounded theory is employed for developing a theoretical account which provides discussion of the topic under investigation in general terms and is grounded in the data collected which phrased by Glaser and Strauss (1967, p.1) as "the discovery of theory from data" (Martin & Turner, 1986). Therefore, Grounded theory can be employed for theory generation or just analyzing the data collected throughout the study, for instance, analyzing the student-created digital stories (Wake, 2012).

Phenomenology is a research methodology which seeks to understand how meaning is created through embodied perception by analyzing the lived experiences of individuals with the issue being researched (Groenewald, 2004; Starks & Trinidad, 2007). Since the experience is core element of digital storytelling process, phenomenological research can be employed for deep analyzing of lived experiences of students or individuals in this process like in the study which investigates moral sense making through digital storytelling (Elmes & King, 2012).

Discourse analysis is the art of observing the human use of language in both written and spoken form (Starks & Trinidad, 2007). Although discourse analysis seems to be used mostly by linguists, it can also be used by researchers of digital storytelling studies to investigate communicational or social structure of digital storytelling process.

Meta-analysis is defined as "the statistical analysis of a large collection of analysis results from individual studies for the purpose of integrating the findings" (Gene Glass, 1976, p. 3). In other words, it's a method of integrating results of primary studies to provide comprehensive judgment about a particular topic (Durlak, 2003). Meta-analysis depends upon a statistical analysis of reported effect sizes of collected experimental studies to calculate overall effect (Lipsey & Wilson, 2001). In case of a collection of qualitative studies, a qualitative version of meta-analysis termed as qualitative meta-analysis or meta-synthesis can be employed to "provide a concise and comprehensive picture of findings across qualitative studies that investigate the same

general research topic" (Timulak, 2009, p.591). By depending of the type of collected research studies, both meta-analysis and meta-synthesis can be employed in the field of digital storytelling.

Survey method, or survey research is defined as "a method of descriptive research used for collecting primary data based on verbal or written communication with a representative sample of individuals or respondents from the target population" (Mathiyazhagan & Nandan, 2010, p. 34). In digital storytelling studies, survey methodology can be used for obtaining views or perception of both teachers and students about the use of digital storytelling in classroom settings.

Developmental research defined as "the systematic study of designing, developing and evaluating instructional programs, processes and products that must meet the criteria of internal consistency and effectiveness" (Seels & Richey, 1994, p. 127). Developmental research stresses on learning as a result of designing unique instructional interventions (Richey & Klein, 2005). Therefore, developmental research enable researchers design, develop and evaluate instructional products or interventions iteratively and leads them learn throughout this process. This methodology can be used in digital storytelling studies for designing, developing and evaluating specific digital story creation platforms/environments or instructional design principles for integration of digital storytelling.

Furthermore, in addition to suggestions for use of specific research methodologies, experts remarked qualitative, in-depth research studies and need of efficiency studies as well. Since the process of a digital story creation involves use of different kinds of skills, learning outcomes, and learning strategies and brings personal experience into the forefront, the process should be investigated and observed deeply by designing a study that not only analyzes process and product but also reveals personal experience. Therefore, in-depth qualitative studies using such as phenomenological research design can be used in the field of digital storytelling as mentioned above. Besides, as used by some of scholars (not too much) and suggested by field experts, experimental

research design can also be used in order to see exact effect of digital storytelling on specific things by measuring effect size. By this way, it's possible to figure out whether digital storytelling is effective on something or not or if it is effective on something to what extent it's effective. Briefly, there emerges the need of employing above mentioned research methodologies in order to make contributions to the digital storytelling literature in education.

As a result, it can be stated that digital storytelling is a process and needs to be investigated deeply. Therefore, in order to investigate the process as a whole *mixed-method* design can be employed. According to researcher, as field experts emphasized as well, *experimental studies* need to be conducted to see overall or exact effect of digital storytelling on specific issues and to saturate experimental studies in the field of educational use of digital storytelling in order for employing secondary analysis called as "analysis of analyses" (Glass, 1976) or in other names *meta-analysis*. In addition to these methodologies, *phenomenological research study* or *narrative inquiry* methodology can be conducted to reveal out the lived experience of individuals since the experience whether gained or shared throughout the process is the core of the digital storytelling process. In order to capture emotional sharing and intimacy, *in-depth qualitative studies* can also be conducted since revealing emotions is a must for digital storytelling process and is worth to be investigated.

5.1.6. Bases for Digital Storytelling Research Studies

In the literature, there are many bases or step-by-step approaches guiding creation of a digital story or some elements that digital stories should involve; however, the most cited and well-known ones are 7 elements developed by Lambert (2010) within the Center for Digital Storytelling (CDS) and 4-step approach for a creation of digital story (Robin, 2008). Analysis of digital storytelling studies confirmed this as scholars preferred to use/cite Lambert's (2010) 7 elements of a digital story, and Robin's (2008) 4-step approach for creation of a digital story. In the light of this, field experts were asked about importance of these bases and whether they are considered in digital

storytelling studies by researchers. Findings of expert interviews revealed that although all of the interviewed field experts emphasized importance of these 7 elements, they did not reach consensus regarding to use of these elements in digital storytelling studies. While some of them claimed that these elements are used in digital storytelling studies to a large extent, some of them stated that they are not used and considered by researchers in digital storytelling studies. In terms of 4-step approach, field experts consider that these steps should be used as they are good guideline for effective creation of a digital story and make easier of development process. Therefore, comparison of findings of both sections (meta-synthesis and expert interviews) shows that scholars might have had same perspective with the field experts in terms of importance of these 7 elements and 4-steps for creation of digital story and that's why they preferred to use these bases in their studies. According to the researcher, these two conceptual frameworks/bases are utmost importance for digital storytelling process since one of them defines the elements that digital story should involve and other one defines what should be done through creation of a digital story step by step in detail. Therefore, these frameworks should be definitely considered by future researchers while designing their digital storytelling research studies. When the related literature was reviewed, it's seen that these frameworks were not considered by scholars too much. Research studies mentioning one of these frameworks are not so much in terms of quantity. In reviewed publications, it's seen that scholars have not stated use of these frameworks in their research studies. Therefore, it becomes important to state these frameworks if used in research studies in order to guide readers better. Yet another issue that should be considered by future researchers with utmost importance is to not only mention these conceptual bases in literature review section of their studies but also use them for being as a guide in implementation phase of study i.e. making students create their digital stories by following these steps or involving these elements.

5.1.7. Subjects for Digital Storytelling Studies

Analysis of target group selected in digital storytelling studies showed that researchers mostly focused on *grades 6-8* in K-12 education level while conducting research study. This result does not coincide with the findings obtained from expert interviews since they more frequently suggested to work on *all age groups* and *pre-school grade level* specifically. The reason lies behind suggesting pre-school level might be that field experts may have considered possibility of using digital storytelling for very early ages of students and some psychological aspects such as high emotional readiness level for this age group. According to Robin (2016), younger students are more prone to comprehend technological issues and more interested in activities that reflect on computer screen. Furthermore, today, younger people especially preschoolers are more technologically savvy than their parents as they were born to technological era and routinely exposed to computers, electronic games, digital music players and mobile phones in their daily lives (Smeda et al., 2014). Digital storytelling may support making learning more relevant and meaningful for the students of this age group and encourage their creativity as well as give them a voice to share their ideas and emotions in a story form (Robin, 2016, p.19). Developmental properties of this age group defined in Piaget's preoperational stage of intellectual (cognitive) development during which children start to think abstractly and their memory and imagination develop (Ojose, 2008). In addition, preschoolers construct knowledge of their world by the help of stories they hear and participate into (O'Byrne, Stone, & White, 2018). Besides, as some field experts stated too, students at this age group have not developed self-regulation skills yet, indicating that they are not capable of following directions or resisting distractions (Williams, 2018). Self-regulation is a general term which includes regulation of attention, behavior and emotions (Williams, 2018). These components can be empowered by the involvement of storytelling as Papagiorgis (1983) stated that telling a story promotes the strong emotional participation of listeners as a result of matching themselves with the characters of the story (as cited in

Fokides, 2016). Therefore, stories have an important position in pre-school children and should be used in this age group.

The optimal way for using digital storytelling in pre-school education level might be integration of digital storytelling by dividing into parts rather than showing it as a whole since students at this education level are too young to manage whole process at a time. For example, they can practice how to tell a story and draw pictures that correspond the story during a whole term then finding image, voiceover session, and creating a digital story in another term. Yet another, important issues for this age group is that they are not able to write their stories since they do not know how to write text yet and they may not use computers to create their digital stories by using special software. For this age group, facilitators should do these directed by pre-school learners. In other words, facilitators or instructors should be the hand of this age group like in the study conducted by Fokides (2016).

Although, scholars more frequently focused on grade 6-8 level, according to the researcher, primary *school* level is also applicable for integration of digital storytelling. Unlike pre-school education level, this target group can design and develop their own digital stories with the guidance of instructors. This age group has also high emotional readiness level which means that they are more prone to reflect their emotions. Furthermore, if it's considered that today's children are more technology savvy and meet with technology especially mobile phones and tablets at very early ages, they may enjoy dealing with digital storytelling and more profited from using it as a learning activity. Briefly, pre-school and primary school education level can be preferred to integrate digital storytelling in addition to secondary school level (grade 6-8) which was preferred more by scholars of analyzed research publications.

5.1.8. Data Collection for Digital Storytelling Studies

Researchers of analyzed research studies mostly preferred interview method for data collection. Possible reason for this might be supporting quantitative findings or

obtaining in-depth information. This result coincide with the findings obtained expert opinions as they also more frequently suggested *interview* method for data collection. In addition to interviewing, findings of meta-synthesis part showed that researchers used different kinds of data collection methods namely, scales, learner artifacts, achievement tests, field notes, observations, questionnaire, rubrics, audio and video recordings, survey and reflection journals. Some of these data collection methods overlap with the expert interview findings since field experts also suggested to use *observation, field notes, student diaries (reflection journal), video records, achievement tests, scales, questionnaires,* and *rubrics* for data collection. Observation, filed notes and video records may provide process-based data such as interactions among students and interaction with technological devices. Student diaries and rubrics may provide data for evaluation of student artifacts. Achievement test, scales and questionnaires provides data for measurement of achievement change, or other metrics such as perception, attitude and motivation. Unlike scholars of research publications, field experts suggested to use *individual portfolios* and *reports* for collecting data in digital storytelling studies. In addition to all of these data collection methods, according to the researcher, *essays* which are kept daily and provide detailed explanation of the process from the viewpoint of students can be employed since much more knowledge can be obtained if it's collected from actual source.

5.1.9. Findings of Digital storytelling Studies

Findings of analyzed digital storytelling research studies showed that digital storytelling has positive effect mainly on academic achievement, ICT skills, motivation, engagement, collaboration, learning identity, self-control, attitude, self-confidence, communication skills, thinking skills, problem solving skills, multimodal skills, representation skills, and literacy skills. On the other hand, field experts also suggested some variables or research problems to be examined in digital storytelling studies as mainly skill development (21^{st} century skills, thinking skills etc.), learning process, learning outcomes, self-regulation, collaboration, societal issues,

achievement, learning strategies, socialization, participation, attitude, engagement and motivation. When the findings of digital storytelling studies were compared to expert opinions about research problems/variables to be examined in digital storytelling studies, it's revealed that some of them overlapped. These overlapped variables/constructs are *academic achievement, ICT skills, motivation, engagement, collaboration, attitude, product evaluation/quality, communication skills, thinking skills, experience, memory, social inclusion, gender effect, problem solving skills, reflection skills, sharing, literacy skills, online presence, self-awareness, co-creativity, learning outcomes,* and *learning strategies*. This shows that experts provided some variables that were investigated in literature somehow. One of the reasons for this might be that since field experts have a handle of related literature already, they may proposed similar variables/constructs to investigate by being impressed of the related literature. Yet another reason might be that they may consider these similar variables to be examined further. On the other hand, field experts also set light to which variables/constructs should be investigated unlike ones examined already. The variables/constructs that were not investigated so much and needed to be investigated in digital storytelling studies are namely *decision making skills, mental process, psychological aspects, reception, adult education, concept conflict, emotional dimension, inclusive education, story evaluation, meaning making, learning transfer, self-efficacy, self-inquiry, self-evaluation, self-reflection, immigrant integration, culture, racing, democracy consciousness, problem-based learning, learning to learn, learning by doing, social development*, and *catalysis*. Researchers can get these advises and investigates proposed variables/constructs in future digital storytelling studies. In addition to these investigated or suggested variables mentioned above, according to the researcher, some psychological factors might be inspected such as *anxiety* toward using technology or presenting the created digital story, *unwillingness* to participate into process, *disagreement* among peers and change in *emotional states* of students. Furthermore, some *cultural diversities* might be inspected by involvement of inter-national students into process.

5.1.10. Further Research Suggestions for Digital Storytelling Studies

Analysis of further research sections of digital storytelling studies showed that scholars provided suggestions in three categories as research, participant selection and implementation of digital storytelling. Most suggested issues in terms of *research studies* are integration of digital storytelling on different subject areas, need of long-term, follow-up, comparative and experimental studies, need for investigating collaborative learning, intrinsic-extrinsic motivation, gender differences, speaking skills, listening skills and learning outcomes. Similarly field experts remarked need of *experimental studies*, integrating *digital storytelling on different subject areas or disciplines*, investigating *gender differences, collaborative learning* and *intrinsic-extrinsic motivation*. These issues can be considered in future research studies.

For *the implementation of digital storytelling* scholars of analyzed digital storytelling publications suggested to use more specific instructional strategies, focus on multi-modal learning, work as peers or a group, use collaborative digital story creation platforms or mobile digital story creation platforms, scaffold students during creation of digital story, design instruction which improves self-evaluation skills of students and implement digital storytelling on secondary education level. When these suggestions given by scholars compared to suggestion of field experts in terms of implementation of digital storytelling, only similarity was revealed as field experts also suggested to give importance to co-creativeness and interactions among peers which overlaps with the scholars' suggestion of *working as a peer or a group*. Unlike suggestions given by scholars, field experts suggested to *encourage students* to externalize their narratives, *consider student properties* and *class context*, *make students explore themselves*, *keep students' originality* and *make them feel special* in terms of implementation of digital storytelling. Furthermore, field experts remarked that following certain steps or frameworks during a creation of digital story is also important but flexibility might be shown among these steps (e.g. changing the order of some steps or eliminating some of them if needed in certain situations). According

to field experts, it's also important to make learners (or storytellers) tell their stories in a pattern and context by relating with their own real life in order to increase permanence and memorability. All of these suggestions can be considered by instructional designers, educational stakeholders and researchers while integrating/implementing digital storytelling in education.

In terms of *participant selection*, scholars of digital storytelling publications proposed to take participation of subjects from range of contexts, keep subject sample as large, and involve participants from different grade levels and participants having different learning styles/strategies. When these participant-based suggestions of scholars was compared to the ones field expert suggested, it's revealed that they also suggested some similar things with scholars namely as involving *participants from different grade levels*, participation of *subjects from range of contexts*, and involving *participants having different learning styles/strategies*. These suggestions may guide future researchers in terms of defining participant group.

5.1.11. Subject Areas and Fields for Integration of Digital Storytelling

Meta-synthesis of digital storytelling research studies revealed that scholars of analyzed studies mainly focused on language education while conducting their digital storytelling studies. Only minority of them focused on a subject area or field different than language education as follows; Physics (Kotluk & Kocakaya, 2017), Mathematics (Karaoglan Yilmaz, Özdemir, & Yasar, 2018; Özpinar, Gökçe, & Yenmez, 2017), Social Studies (Sarıtepeci, 2017; Turan & Seker, 2018), Arts (Alrutz, 2015; Özturk & Tunç, 2017), Science (Hung et al., 2012a; Kocaman-karoglu, 2016; Kulla-Abbott & Polman, 2008; Nam, 2016), ICT use (Chia-Wen, Pei-Di, & Rong-An, 2015; Sarıtepeci & Durak, 2016), Health (Mnisi, 2015), History (Silseth, 2013).On the other hand, field experts proposed wide range of subject areas and fields for the integration of digital storytelling into education or for conducting research studies. Major suggested subject areas are *science courses* (e.g. math and physics), *literature*, *social science courses* (e.g. history and psychology), *health and sport courses*, *art courses* (e.g. music),

special education, pre-service teacher education and *geriatric education*. In addition to these subject areas, field experts also proposed fields for implementation of digital storytelling namely as *education, communication, health, architecture, aviation, women studies, sports* and *social services*. Therefore, above mentioned subject areas and fields can be used by future researchers, instructional designers, educational policies or stakeholders for implementation/integration of digital storytelling. According to researcher, since digital storytelling provides a structure of telling personal experience, it can also be used in the fields that requires transferring experience from experts to novices such as cooking, handcrafting, cultural studies, nursing, midwifery, clinical practice, nutrition and dietetics and the fields in which experiences shared by storytelling. Furthermore, digital storytelling can also be integrated in museums or in the field of archeology for providing oral history of the ancient terms or colonies, historical places or objects and community.

5.1.12. Future of Digital Storytelling

Field expert provided some directions for the future of digital storytelling in various dimensions. For the technological dimension, they proposed that technological developments will provide so many opportunities and make digital story creation easier than before. According to them, technology will make digital storytelling more popular and accessibility of technological tools will be easier. Furthermore, technological developments make possible of creating digital stories by using different technologies such as virtual reality or augmented reality and by this way their effect or impression on people will become much more since experiences are transferred via living. Field experts provided some prediction's about the future of digital storytelling as well. According to them, digital storytelling will continue to be used without losing its prevalence since storytelling is in the core. Furthermore, digital storytelling will be understood better and the distinction between what digital storytelling is and what is not will become so clear. Besides, integration of digital storytelling will be easier by the help of reduction of technological barriers (accessibility). Yet another prediction

made by field experts is that digital storytelling will be used/integrated on different areas, disciplines and grade levels. In terms of popularity, field experts stated that popularity of digital storytelling will continue to rise with the help of easy accessed technologies and online tools. In addition to all of these, according to the researcher, it can be claimed that digital storytelling is not well-known enough among educators and other professions. Therefore, the popularity of this teaching and learning method might be increased by taking governmental policies across the country. It's no doubt that technology especially web 2.0 tools might have a great effect on popularizing this method over time, however, the importance of story or storytelling should not be ignored and keep in mind all the time.

Table 5.1 below shows the summary of discussions made on findings from both meta-synthesis and expert opinions sections in the light of main themes and the support of related literature.

Table 5.1. *Summary of Discussions*

	Meta-Synthesis	**Experts**	**Literature**
Theoretical-Base for DST studies	*Constructivism*, *social constructivism*, multi-literacies pedagogy	*Constructivism*, *social constructivism*, collaborative learning	Self-construction of knowledge through interacting with environment (Svinicki, 2010; Phillips, 1995; Duffy et. al., 2012; Smeda et. al., 2014; Behmer, 2005). Learning is an integral and inextricable aspect of social practice (Lave, & Wenger, 1991) and students learn through the support/guidance of others to achieve something which they cannot do by themselves (Rogoff, 2003; Vygotsky, 1978 as cited in; Fokides, 2016).

Purpose of DST Studies	Investigating of *achievement*, ICT use and language skills	Investigating of *achievement*, social success factors, psychological dimension	
Research Problems for DST studies	Achievement, opinions, ICT use	Skills, self-regulation, experience	
Research Methodology	*Experimental, Mixed-method*, Case Study	*Experimental, Mixed-method*, Ethnography	observing measurable effects of an intervention (Whalley, 2006), in-depth investigation of process (Johnson, Onwuegbuzie, & Turner, 2007; Shorthen, & Smith, 2017), directly observing individuals in natural settings to describe interpersonal behaviors, material productions and beliefs (Angrosino, 2007)
Conceptual Base for DST studies	Lambert's (2010) 7 elements of DST, Robin's (2008) 4 step approach for DST creation	Both are essential and good guideline for digital storytelling process	
Subject Group	Grades 6-8	Pre-school level	Digital storytelling may support making learning more relevant and meaningful for the students of pre-school age group and encourage their creativity as well as give them a voice to share their ideas and emotions in a story form (Robin, 2016, p.19). Pre-school age group characteristics are defined by Piaget's preoperational stage of intellectual (cognitive)

			development during which children start to think abstractly and their memory and imagination develop (Ojose, 2008). In addition, preschoolers construct knowledge of their world by the help of stories they hear and participate into (O'Byrne, Stone, & White, 2018).
Data Collection Methods	*Interview*, scales, learner artifacts, *achievement tests*	*Interview*, observation, *achievement tests*	
Findings of DST studies / Problems to be investigated	DST is effective for academic achievement, self-skills, motivation, ICT skills	Skills, experience, collaboration	

5.2. Implications for Practice

Implicational considerations for practice are multifaceted since different stakeholders can benefit from integration of digital storytelling. Therefore, implications for practice were stated here by considering various perspectives as pre-service education, educational policy makers, instructional designers, curriculum designers, technology integration and design.

From *the pre-service teacher education* perspective, it can be said that digital storytelling should be integrated into all pre-service teacher education programs as an instructional design course topic. By this way, teacher candidates can benefit from taking this course as they learn what digital storytelling is, how it can be integrated K-12 education level, what kind of digital stories can be developed/created in related

subject areas, what kind of principles and theoretical bases guide digital storytelling process, issues that should be considered during implementation of digital storytelling in classroom settings, what kind of advantages digital storytelling possess in terms of teaching and learning and etc. Furthermore, pre-service teachers can also be guided to practice about creating their own digital stories in the context of undergraduate course and they can be assigned a project through which they practice integration of digital storytelling into K-12 education level within the scope of school experience course. Within this scope, pre-service teachers can be guided to implement digital storytelling by using different kinds of theoretical bases such as constructivism, social constructivism, collaborative learning, situated learning and etc. in order to comprehend the difference among them. Thus, pre-service teachers get the chance of deeply learn about digital storytelling and practice individually by both creating personal digital story and implementing it into K-12 education. In addition, it can be stated that pre-school education (or early childhood education) program in pre-service teacher education programs may benefit more from the integration of digital storytelling in their related curriculum since pre-school children are prone to use technological devices and need to develop their self-regulation skills as mentioned in section 5.7 above. Furthermore, according to researcher, digital storytelling may be integrated into curriculum of science-related pre-service teacher education programs such as chemistry education, mathematics education, physics education and science education. All of these mentioned pre-service teacher education programs may benefit from digital storytelling since the analysis of related literature and opinions of field experts remarks that digital storytelling needs to be applied in science and math courses and to be popularized among instructors of these courses. Therefore, the curriculum of these pre-service teacher education programs may be enhanced with the integration of digital storytelling.

From *the educational policy makers* perspective, in-service trainings can be designed for teachers and school administrations in order to encourage/instruct them to integrate digital storytelling in educational settings with the purpose of benefiting from its

various advantages stated by experts and make it more popular among teachers and students. Furthermore, policies about the integration of digital storytelling can be made at curriculum of education about benefits, advantages and effects of digital storytelling in terms of teaching and learning and its necessity to integration into K-12 education level. By this way, minister of education can be aware of digital storytelling and its various benefits and consequently he/she pursues a policy of popularizing the use of digital storytelling in educational settings throughout the country. Since some of the field experts remarked the lack of appropriate technologies for creation of digital stories in schools, yet another implication from the educational policy makers perspective at ministerial level might be making a decision or taking considerable steps of setting up computer labs in schools or improving those already in use so as to meet requirements for digital story creation by procurement of high-performance technologies and tools (video cameras, high quality microphones, licensed video editing and voice capturing software). In addition to all of above mentioned issues, it can be stated that technological equality should be provided among the whole country. In other words, each student from each school should reach equal technological devices or facilities among the whole country. This is the best possible way for making all students to create their own digital stories and popularizing the use of digital storytelling in education.

From *the instructional designers* perspective, courses can be designed for all grade levels from pre-schools to high school level in order to teach students how to create a digital story, what should they care about while creating their digital stories (especially 7 fundamental elements that digital stories must involve and 4-step approach for digital story creation), ethical considerations (e.g. copyright of pictures found on internet), technological trainings (how to use/manage special software for video editing and voice capturing or drawing of their own image). Furthermore, as findings of this study indicates too, constructivism, collaborative learning and cognitivism can be used as a theoretical bases by instructional designers to design a course section for digital storytelling implementation. According to the researcher, there is a need for detailed

description of digital storytelling process especially its components and the knowledge of how to handle it section by section (how to write a story script, how to make storyboarding, how to voiceover a story and etc.). This detailed description of the whole process might be provided through a complete online or face-to-face course designs, workshops, seminars and webinars.

From *the curriculum designers* perspective, some considerations related to subject area and grade level can be taken into as field experts proposed that digital storytelling can be used in every subject areas and fields as well as all grade levels. This study involves valuable findings revealed out from digital storytelling research studies at K-12 education level, however, field experts have an idea of not limiting these type of studies at K-12 level and they claimed that digital storytelling can be used by all age groups from early childhood to adult and even geriatrics. Within this scope, curriculum can be designed or developed according to requirements of each age group. According to researcher**,** in terms of curriculum design perspective, digital storytelling should be integrated into instructional design or method courses of pre-service teacher education programs since the researcher and some of the field experts interviewed consider that digital storytelling is a method or a process not a tool. Therefore, curriculum designers should consider to integrate this process into instructional design or instructional method courses otherwise if it is integrated into instructional material development courses, it can be interpreted as just a material and limited to dimension of material development. As mentioned before in related sections, digital storytelling is not just a production of digital material, it needs some requirements and procedures, sharing of emotions and ideas and belongs some other features discriminating it from being material development.

From *the technology integration* perspective enablers or barriers for integrating digital storytelling in K-12 education level might be defined and the ways of eliminating those barriers might be specified. In addition, the best way for integrating digital storytelling in each grade level should be specified within the scope of technology integration. For

instance, the ways for integrating digital storytelling into pre-school education level might be considered since the age of this grade level is too young to handle computer use for creating a digital story. Furthermore, in order to lessen barriers hold by in-service teachers for integrating digital storytelling into instructional settings, teacher education programs can be designed by providing in-service teacher trainings for example.

From *the design* perspective, as field experts stated that too, mobile digital storytelling creation platforms can be designed for easing development process by providing mobility to storytellers. Furthermore, some design solutions considered for specific grade levels (e.g. simplified designs for pre-school children) or groups (e.g. special designs for children having dyslexia or autism). In addition to these, designers can develop a learning management system or an educational software that teaches students how to create an effective digital story step-by-step (or modular structure) by providing fundamental principles and practical examples.

5.3. Implications for Future Research

This study inspected digital storytelling research studies conducted in the field of education in last 18 years and obtained opinions of field experts to direct future research and revealed invaluable findings, directions and suggestions for future digital storytelling research studies. However, the scope of this study is limited to K-12 education level. Therefore, future research studies may inspect overall use of digital storytelling in higher education level, adult education or geriatrics. Furthermore, if the field of educational use of digital storytelling reaches sufficient experimental research studies, quantitative meta-analysis which calculates overall effect of digital storytelling on specific things for example academic achievement or technology use might be conducted to see whether digital storytelling makes changes on something clearly. Besides, comparative studies might be also designed to see which educational level benefits best from the digital storytelling implementation.

On the other hand, it's crucial to state here that an important deficiency noticed after analyzing digital storytelling publications within the scope of this study is poor reporting of research problems and methodologies. Even, some studies were eliminated from involvement in deep analysis procedure since their research problems and methodologies were not clearly defined and reported. Therefore, in the future, there is a strong need of digital storytelling studies that clearly defines research problems and methodology since these sections are heart of the research studies. Yet another deficiency realized during the analysis of selected digital storytelling publications is non-use of conceptual frameworks that shape and guide digital storytelling implementation. Therefore, the use of these conceptual frameworks especially Lambert's (2010) 7 elements of a digital story and Robin's (2008) 4-step approach for a creation of effective digital story is crucial in digital storytelling studies. In the future studies, researchers should consider these frameworks and they should not only state them in literature or methodology part of their study but also use them for creation of a digital story.

Furthermore, findings of this study indicates that there is a need of research studies inspecting collaborative or cognitive dimension of digital storytelling process. Therefore, future researchers should consider this indication. In addition, in-depth investigation of digital storytelling process is another indicated issue for future research studies. In terms of research methodology, need of ethnographical studies and experimental studies that measures efficiency were indicated by field experts for future researchers. In terms of research problems, future researchers should inspect skill use, self-regulation and experience of students or storytellers. Findings of the study indicated that digital storytelling can be implemented for all age groups but it should be investigated for especially pre-school level. Therefore, future researchers should focus on pre-school level or early childhood while designing a digital storytelling study. Beside all of aforementioned issues, each sections/headings mentioned above provides wide range of suggestions for future research implications.

REFERENCES

Ackermann, E. (2001). Piaget's Constructivism, Papert's Constructionism : What's the difference ? *Constructivism: Uses and Perspectives in Education*, 1–11.

Ahn, E., & Kang, H. (2018). Introduction to Systematic Review and Meta-Analysis: A Health Care Perspective. *Korean Journal of Anesthesiology*, *71*(2), 1–38.

Al-araibi, A. A. M., Mahrin, M. N. bin, & Yusoff, R. C. M. (2019). Technological aspect factors of E-learning readiness in higher education institutions: Delphi technique. *Education and Information Technologies*, *24*(1), 567–590.

Alcantud-Diaz, M. (2013). Fighting the Myths and Misconceptions on Evil Stepmothers: Long Life Learning by Means of Digital Storytelling. *E-Teals: An E-Journal of Teacher Education & Applied Language Studies*, *4*(4), 1–18.

Alesandrini, K., & Larson, L. (2002). Teachers Bridge to Constructivism. *The Clearing House*, *75*(3), 118–121.

Allen, G. (2006). A critique of using grounded theory as a research method. *Electronic Journal of Business Research Methods*, *2*(1), 1–10.

Aloisi, G., & Scana, M. (2016). Social Networks and Collaborative Learning. *Euopean Journal of Open Education and E-Learning Studies*, *1*(1), 51–57.

Alrutz, M. (2015). Digital Storytelling and Youth: Toward Critically Engaged Praxis. *Youth Theatre Journal*, *29*(1), 1–14.

Anderson, K. T., & Weninger, C. (2012). Tracing ideologies of learning in group talk and their impediments to collaboration. *Linguistics and Education*, *23*(3), 350–360.

Angay-Crowder, T., Choi, J., & Yi, Y. (2013). Putting Multiliteracies into Practice:

Digital Storytelling for Multilingual Adolescents in a Summer Program. *TESL Canada Journal*, *30*(2), 36–45.

Angrosino, M. (2007). *Qualitative Research kit: Doing ethnographic and observational research*. London, SAGE Publications.

Anu, L., Jorma, E., & Sinikka, P. (2014). The case of design-oriented pedagogy: What students' digital video stories say about emerging learning ecosystems. *Education and Information Technologies*, *19*(3), 583–601.

Baim, S. A. (2015). Digital Storytelling: Conveying the Essence of a Face-to-Face Lecture in an Online Learning Environment. *The Journal of Effective Teaching*, *15*(1), 47–58.

Baki, Y., & Feyzioglu, N. (2017). The Effects of Digital Stories on The Writing Skills of 6th Grade Students. *International Online Journal of Educational Sciences*, *9*(3), 686–704.

Bandi-Rao, S., & Sepp, M. (2014). Designing a Digital Story Assignment for Basic Writers Using the TPCK Framework. *Journal of Basic Writing*, *33*(1), 103–123.

Bashirnezhad, H., & Yousefi, A. (2017). Digital Storytelling Listening Influence on Iranian Intermediate EFL Learners' Pronunciation. *Revista QUID*, (Special Issue), 1702–1707.

Bass, R., & Linkon, S. L. (2008). On the evidence of theory: Close reading as a disciplinary model for writing about teaching and learning. *Arts and Humanities in Higher Education*, *7*(3), 245–261.

Batsila, M., & Tsihouridis, C. (2016). " Once upon a Time there was …" A Digital World for Junior High School Learners. *International Journal of Emerging Technologies in Learning (iJET)*, *11*(3), 42–50.

Becker, K., & Freberg, K. (2014). Medical student storytelling on an institutional blog:

a case study analysis. *Medical Teacher*, *36*(5), 415–21.

Behmer, S. (2005). Literature Review Digital storytelling: Examining the process with middle school students. In C. Crawford, R. Carlsen, I. Gibson, K. McFerrin, J. Price, R. Weber, & D. A. Willis (Eds.), *Proceedings of the Society for Information Technology & Teacher Education International Conference* (pp. 822-827). Chesapeake, VA: AACE.

Bjørgen, A. M. (2010). Boundary crossing and learning identities – digital storytelling in primary schools. *Seminar.net. International Journal of Media, Technology & Lifelong Learning*, *6*(2), 161–178.

Blas, N. Di, Garzotto, F., Paolini, P., & Sabiescu, A. (2009). Digital Storytelling as a Whole-Class Learning Activity : Lessons from a Three-Years Project. In *International Conference on Interactive Digital Storytelling* (pp. 14–25).

Blieck, Y., Ooghe, I., Zhu, C., Depryck, K., Struyven, K., Pynoo, B., & Van Laer, H. (2019). Consensus among stakeholders about success factors and indicators for quality of online and blended learning in adult education: a Delphi study. *Studies in Continuing Education*, *41*(1), 36–60.

Blithe, S. J., Carrera, W., & Medaille, A. (2015). Stories of Service-Learning: Guidelines for Increasing Student Engagement With Digital Storytelling. *Journal of Library Innovation*, *6*(1), 60–74.

Blumenfeld, P. C., Soloway, E., Marx, R. W., Krajcik, J. S., Guzdial, M., & Palinscar, A. (1991). Theor Framework. *Educational Psychologist*, *26*(3), 369–398.

Bogard, J. M., & Mcmackin, M. C. (2012). Combining Traditional and NEw Literacies in a 21st-Century Writing Workshop. *The Reading Teacher*, *65*(5), 313–324.

Bonwell, C., & Eison, J. (1991). Active Learning: Creating Excitement in the Classroom AEHE-ERIC Higher Education Report No. 1. Washington, D.C.:

Jossey-Bass.

Bowman, N. A. (2012). Effect Sizes and Statistical Methods for Meta-Analysis in Higher Education. *Research in Higher Education*, *53*(3), 375–382.

Bratitsis, T., & Ziannas, P. (2015). From Early Childhood to Special Education: Interactive Digital Storytelling as a Coaching Approach for Fostering Social Empathy. *Procedia Computer Science*, *67*(Dsai), 231–240.

Braun, V., & Clarke, V. (2006).Using Thematic Analysis in Psychology. *Qualitative Research in Psychology*, 3:77-101.

Brown, J., Bryan, J., & Brown, T. (2005). Twenty-First Century Literacy and Technology in K-8 Classrooms. *Innovate Journal of Online Education*, *1*(3), 5.

Brown, J. S., Collins, A., & Duguid, P. (1989). Situated cognition and the culture of learning. *Educational Researcher*, *18*(1), 32–42.

Bull, G., & Kajder, S. (2004). Digital Storytelling. *Learning and Leading with Technology*, *32*(4), 46–49.

Cabrejas Peñuelas, A. B. (2013). The use of glogs in the English language classroom. *@Tic. Revista D'Innovació Educativa*, *0*(10), 68–74.

Campbell, T. A. (2012). Digital storytelling in an elementary classroom : Going beyond entertainment. In *International Conference on Education and Educational Psychology* (Vol. 69, pp. 385–393).

Castaneda, M. E. (2013). Digital storytelling: Buiding 21st century literacy in the foreign language classroom. *The NECTFL Review*, *January*(71), 55–65.

Castañeda, M. E. (2013). "I am proud that I did it and it's a piece of me": Digital Storytelling in the Foreign Language Classroom. *CALICO Journal*.

Chia-Wen, T., Pei-Di, S., & Rong-An, L. (2015). Exploring the Effects of Student-

Centered Project-Based Learning with Initiation on Students ' Computing Skills : A Quasi-Experimental Study of Digital Storytelling. *International Journal of Information and Communication Technology Education*, *11*(1), 27–43.

Christiansen, A. (2011). Storytelling and professional learning: A phenomenographic study of students' experience of patient digital stories in nurse education. *Nurse Education Today*, *31*(3), 289–293.

Chung, S.-K. (2006). Digital storytelling in integrated arts education. *The International Journal of Arts Education*, *4*(1), 33–50.

Clarke, R., & Adam, A. (2012). Digital storytelling in Australia: Academic perspectives and reflections. *Arts and Humanities in Higher Education*, *11*(1–2), 157–176.

Cole, G., Street, K., & Felt, L. J. (2012). Storytelling in the Digital Age: Engaging Learners for Cognitive and Affective Gains, *8*.

Combs, M., & Beach, J. D. (1994). Stories and storytelling: Personalizing the social Studies. *The Reading Teacher*, *47*(6), 464–471.

Condy, J., Chigona, A., Gachago, D., & Ivala, E. (2012). Pre-Service Students' Perceptions and Experiences of Digital Storytelling in Diverse Classrooms. *Turkish Online Journal of Educational Technology*, *11*(3), 278–285.

Connelly, F. M., & Clandinin, D. J. (1990). Stories of Experience and Narrative Inquiry. *Educational Researcher*, *19*(5), 2.

Cooper, H., Hedges, L., & Valentine, J. (2009). *The handbook of research synthesis and meta-analysis*.

Crăciun, D., Crăciun, P., & Bunoiu, M. (2016). Digital storytelling as a creative teaching method in Romanian science education. *9Th International Physics …*, *310001*.

Cushing, D. F., & Love, E. W. (2013). Developing cultural responsiveness in environmental design students through digital storytelling and photovoice. *Journal of Learning Design Cushing & Love Special Issue: Design Education*, *6*(3), 63–75.

Damavandi, Z. M., Hassaskhah, J., & Zafarghandi, A. M. (2018). The Effects of Computer Assisted Mediating Prompts on EFL Learners' Writing Ability. *International Journal of Education and Literacy Studies*, *6*(1), 64–71.

Daniels, K. (2013). Exploring the impact of critical reflection through the use of service-learning and digital storytelling. *Journal on School Educational Technology*, *9*(1), 1–10.

Duman, B., & Göcen, G. (2015). The effect of the digital storytelling method on pre-service teachers' creative writing skills. *Anthropologist*, *20*(1–2), 215–222.

Duveskog, M., Tedre, M., Sedano, C. I., & Sutinen, E. (2012). Life planning by digital storytelling in a primary school in rural Tanzania. *Educational Technology and Society*, *15*(4), 225–237.

Eck, J. (2006). *An Analysis of the Effectiveness of Storytelling with Adult Learners in Supervisory Management* (Unpublished Master's Thesis). University of Wisconsin-Stout.

Elmes, M., & King, K. (2012). Moral Sensemaking Through Digital Storytelling. *Journal of Business Ethics Education*, *9*(1), 259–280.

Ennis, R. H. (1993). Critical thinking assessment. *Theory Into Practice*.

Finfgeld, D. L. (2003). Metasynthesis: The state of the art - so far. *Qualitative Health Research*, *13*(7), 893–904.

Fischer, G. (2000). Lifelong Learning - More than training. *Journal of Interactive Learning Research*, *11*(3/4), 265–294.

Fisher, W. R. (1987). *Human communication as narration: toward a philosophy of reason, value, and action*. *Studies in rhetoriccommunication* (Vol. 10).

Fokides, E. (2016). Using Digital Storytelling to Help First-Grade Students Adjustment to School. *Contemporary Educational Technology*, *7*(3), 190–205.

Fries-Gather, J. (2010). Digital Storytelling Promotes Writing Across Content Areas. *Ohio Journal of English Language Arts*, *50*(1), 9–13.

Gachago, D., Condy, J., Ivala, E., & Chigona, A. (2014). "All stories bring hope because stories bring awareness": students' perceptions of digital storytelling for social justice education. *South African Journal of Education*, *34*(4), 12.

Gaeta, M., Loia, V., Mangione, G. R., Orciuoli, F., Ritrovato, P., & Salerno, S. (2014). A methodology and an authoring tool for creating Complex Learning Objects to support interactive storytelling. *Computers in Human Behavior*, *31*(1), 620–637.

Glass, G. V. (1976). Primary , Secondary , and Meta-Analysis of Research ', *5*(10), 3–8.

Glass, G. V., McGaw, B., & Smith, M. L. (1981). *Meta-analysis in Social Research*. London, SAGE Publications.

Good, T. L., & Brophy, J. E. (1990). *Educational psychology: A realistic approach (4th ed.)*. New York, NY, US: Longman/Addison Wesley Longman

Gregori-Signes, C., & Pennock-Speck, B. (2012). Digital storytelling as a genre of mediatized self-representations: An introduction. *Digital Education Review*, *22*(1).

Grime, M. M., & Wright, G. (2016). Delphi Method. *Wiley StatsRef: Statistics Reference Online*, (May 2019), 1–6.

Groenewald, T. (2004). A Phenomenological Research Design Illustrated.

International Journal of Qualitative Methods, *3*(1), 42–55.

Group, N. L. (New London Group) (1996). A pedagogy of multiliteracies: Designing social futures. *Harvard Educational Review*, *66*(1), 60.

Guajardo, M., Oliver, J. A., Rodriguez, G., Valadez, M. M., Cantu, Y., & Guajardo, F. (2011). Reframing the Praxis of School Leadership Preparation through Digital Storytelling. *Journal of Research on Leadership Education*, *6*(5), 145–161.

Gyabak, K., & Godina, H. (2011). Digital storytelling in Bhutan: A qualitative examination of new media tools used to bridge the digital divide in a rural community school. *Computers and Education*, *57*(4), 2236–2243.

Hafner, C. A., & Miller, L. (2011). Fostering Learner Autonomy in English for Science : a Collaborative Digital Video Project in a Technological Learning Environment 1, *15*(3), 68–86.

Halvorsen, K. T. (1994). *The reporting format*. In H. Cooper and L. V. Hedges (Eds.), The handbook of research synthesis (pp. 425–437). New York: Russell Sage Foundation.

Hamilton, M., & Weiss, M. (1990). *Children Tell Stories: A Teaching Guide*. R.C. Owen Publishers.

Haydon, G., Browne, G., & van der Riet, P. (2018). Narrative inquiry as a research methodology exploring person centred care in nursing. *Collegian*, *25*(1), 125–129.

Heo, M. (2009). Digital storytelling: An empirical study of the impact of digital storytelling on pre-service teachers' self-efficacy and dispositions towards educational technology. *Journal of Multimedia and Hypermedia*, *18*(4), 405–428.

Hibbing Anne Nielsen, & Rankin-Erickson, J. L. (2003). A picture is worth a thousand words: Using visual images to improve comprehension for middle school

struggling readers. *The Reading Teacher*, *56*(8), 758–770.

Hug, T. (2012). Storytelling - EDU: Educational - Digital - Unlimited? *Seminar.net. International Journal of Media, Technology & Lifelong Learning*, *8*(1).

Hung, C.-M., Hwang, G.-J., & Huang, I. (2012a). A Project-based Digital Storytelling Approach for Improving Students' Learning Motivation, Problem-Solving Competence and Learning Achievement. *Educational Technology & Society*, *15*(4), 368–379.

Hung, C.-M., Hwang, G.-J., & Huang, I. (2012b). A Project-based Digital Storytelling Approach for Improving Students' Learning Motivation, Problem-Solving Competence and Learning Achievement. *Journal of Educational Technology and Society*, *15*(4), 368–379.

Hur, J. W., & Suh, S. (2012). Making Learning Active with Interactive Whiteboards, Podcasts, and Digital Storytelling in ELL Classrooms. *Computers in the Schools*, *29*(November), 320–338.

Javadi, M., & Zarea, K. (2016). Understanding Thematic Analysis and its Pitfall. *Journal of Client Care*, *1*(1), 34-40.

Johnson, R. B., Onwuegbuzie, A. J., & Turner, L. A. (2007). Toward a Definition of Mixed Methods Research. *Journal of Mixed Methods Research*, *1*(2), 112–133.

Kafai, Y., & Resnick, M. (1996). Constructionism in practice: Designing, thinking, and learning in a digital world. Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

Karaoglan Yilmaz, F. G., Özdemir, B. G., & Yasar, Z. (2018). Using digital stories to reduce misconceptions and mistakes about fractions: an action study. *International Journal of Mathematical Education in Science and Technology*, *49*(6), 867–898.

Kelchtermans, G. (2009). Who I am in how I teach is the message : self-understanding,

vulnerability and reflection. *Teachers and Teaching: Theory and Practice*, *15*(2), 257–272.

Kervin, L., & Mantei, J. (2016). Digital storytelling : Capturing children ' s participation in preschool activities. *Issues in Educational Research*, *26*(2), 225–241.

Khan, J. S. (2012). Concept Mapping; Rationale of LEarning Theories. *Professional Medical Journal*, *19*(5), 588–596.

Kimura, M. (2012). Digital storytelling and oral fluency in an English reading class at a Japanese University. *International Journal of Computer Assisted Language Learning and Teaching (IJCALLT)*, *2*(1), 1-17.

Knowles, M. (1975). *Self-Directed Learning: A Guide for Learners and Teachers*. Chicago, IL: Follett Publishing Company.

Kocaman-karoglu, A. (2016). Personal voices in higher education : A digital storytelling experience for pre-service teachers, 1153–1168.

Kolb, D. A. (1984). Experiential Learning: Experience as the Source of Learning and Development. Englewood Cliffs, NJ: Prentice Hall.

Kolodner, J. L. (1992). An introduction to case-based reasoning. *Artificial Intelligence Review*, *6*(1), 3–34.

Konstantopoulos, S. (2016). 11. meta-analysis. In *Handbook of Quantitative Methods for Educational Research* (pp. 231–246).

Kotluk, N., & Kocakaya, S. (2017). The Effect of Creating Digital Storytelling on Secondary School Students' Academic Achievement, Self Efficacy Perceptions and Attitudes Toward Physics. *International Journal of Research in Education and Science (IJRES)*, *3*(1), 218–227.

Kramp, M. K. (2004). Exploring Life and Experience through Narrative Inquiry. In de Marris, K., & Lapan, S. (Eds.), *Foundations of Research: Methods of Inquiry in Education and the Social Sciences*, pp. 103-122. Lawrence Erlbaum, NJ.

Kretchmar, J. (2015). *Seymour Papert and Constructionism*. Research Starters: Education (Online Edition).

Kulla-Abbott, T., & Polman, J. L. (2008). Engaging student voice and fulfilling curriculum goals with digital stories. *Technology, Humanities, Education, & Narrative*, (5), 38–60.

Lambert, J. (2010). *Digital storytelling cookbook. Education for primary care an official publication of the Association of Course Organisers National Association of GP Tutors World Organisation of Family Doctors* (Vol. 20).

Lave, J., & Wenger, E. (1991) Situated Learning: Legitimate Peripheral Participation. Cambridge: Cambridge University Press.

Liu, K. P., Tai, S. J. D., & Liu, C. C. (2018). Enhancing language learning through creation: the effect of digital storytelling on student learning motivation and performance in a school English course. *Educational Technology Research and Development*, *66*(4), 913–935.

Liu, M. C., Huang, Y. M., & Xu, Y. H. (2018). Effects of individual versus group work on learner autonomy and emotion in digital storytelling. *Educational Technology Research and Development*, *66*(4), 1009–1028.

Maguire, M., & Delahunt, B. (2017). Doing a Thematic Analysis: A Practical, Step-by-Step Guide for Learning and Teaching Scholars. *All Ireland Journal of Teaching and Learning in Higher Education (AISHE-J)*, *8*(3), 3351-3364.

Maier, R. B., & Fisher, M. (2007). Strategies for Digital Storytelling via Tabletop Video: Building Decision Making Skills in Middle School Students in

Marginalized Communities. *Journal of Educational Technology Systems*, *35*(2), 175–192.

Martin, P. Y., & Turner, B. A. (1986). Grounded Theory and Organizational Research. *The Journal of Applied Behavioral Science*, *22*(2), 141–157.

Mathiyazhagan, T., & Nandan, D. (2010). *Survey research method*. Media Mimansa.

Matthews, R.S. (1996). Collaborative learning: Creating knowledge with students. In R.J. Menges, M. Weimer, Associates (Eds.), *Teaching on solid ground: Using scholarship to improve practice* (pp. 101-124). San Francisco: Jossey-Bass.

Mayer, J. D., Roberts, R. D., & Barsades, S. G. (2008). Human abilities: emotional intelligence. *Annual Review of Psychology, 59*, 507 – 536.

Mccarthey, S. J. (2004). Bakhtin ' s Dialogism in a Preschooler ' s Talk. *Literacy Teaching and Learning*, *8*(2), 27–62.

McNiff, J., & Whitehead, J. (2006). *Action Research Living Theory*. London, SAGE Publications.

Merriam, S. B. (2017). Adult Learning Theory : Evolution and Future Directions. *Journal of Lifelong Learning*, *26*, 21–37.

Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record*, *108*(6), 1017–1054.

Mnisi, T. (2015). Digital storytelling : Creating participatory space , addressing stigma , and enabling agency. *Perspectives in Education*, *33*(4), 92–107.

Moen, T. (2006). Reflections on the Narrative Research Approach. *International Journal of Qualitative Methodology, 5*(4), 56-69.

Mouchtari, E., Meimaris, M., Gouscos, D., & Sfyroera, M. (2015). Learning and

intergenerational communication through digital storytelling in the first grades of primary school: Yesteryear Jobs. *Cultural Science Journal*, *8*(2), 63.

Nam, C. W. (2016). The effects of digital storytelling on student achievement , social presence , and attitude in online collaborative learning environments. *Interactive Learning Environments*, *0*(0), 1–16.

Normann, A. (2011). *Digital Storytelling in Second Language Learning: A Qualitative Study on Students' Reflections on Potentials for Learning* (Unpublished Master's Thesis). Norwegian University of Science and Technology.

Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic Analysis: Striving to Meet the Trustworthiness Criteria. *International Journal of Qualitative Methods*, 16: 1-13.

O'Byrne, W. I., Stone, R., & White, M. (2018). Digital storytelling in early childhood: Student illustrations shaping social interactions. *Frontiers in Psychology*, *9*(1800), 1–14.

Oakley, G., Pegrum, M., Xiong, X. B., Lim, C. P., & Yan, H. (2018). An online Chinese-Australian language and cultural exchange through digital storytelling. *Language, Culture and Curriculum*, *31*(2), 128–149.

Ohler, J. (2005). The World of Digital Radio. *Educational Leadership*, *63*(4), 44–47. http://doi.org/10.1109/38.156020

Ojose, B. (2008). Applying Piaget's Theory of Cognitive Development to Mathematics Instruction. *The Mathematics Educator*, *18*(1), 26–30.

Olshfski, D., & Joseph, A. (1991). Assessing Training Needs of Executives Using the Delphi Technique. *Public Productivity and Management Review*, *14*(3), 297–301.

Oppermann, M. (2008). Digital Storytelling and American Studies Critical trajectories

from the emotional to the epistemological. *Arts and Humanities in Higher Education*, *7*(2), 171–187.

Özpinar, İ., Gökçe, S., & Yenmez, A. A. (2017). Effects of Digital Storytelling in Mathematics Instruction on Academic Achievement and Examination of Teacher-Student Opinions on the Process. *Journal of Education and Training Studies*, *5*(10), 137.

Özturk, A., & Tunç, Ö. A. (2017). The effect of digital stroytelling project on fine arts high school students' teamwork skills. *Journal of Educational and Instructional Studies in the World*, *7*(4), 58–68.

Pang, Francis; Drummond, Michael; Song, F. (1999). The Use of Meta-Analysis in Economic Evaluation. *Centre for Health Economics, University of York, UK; NHS Centre for Reviews and Disseminations, University of York, UK*, 1–29.

Papadopoulou, S., & Vlachos, K. (2014). Using digital storytelling to develop foundational and new literacies. *Research Papers in Language Teaching and Learning*, *5*(1), 235–258.

Papert, S. (1993). *The children's machine: Rethinking school in the age of computer*. New York: Basic Books.

Pappamihiel, N. E., Ousley-Exum, D., & Ritzhaupt, A. (2017). The impact of digital stories on preservice teacher beliefs about English language learners. *Teaching and Teacher Education*, *67*, 171–178.

Pardo, B. S. (2014). Digital storytelling: A case study of the creation, and narration of a story by EFL learners. *Digital Education Review*, (26), 74–84.

Petticrew, M., & Roberts, H. (2006). *Systematic reviews in the social sciences*: *A practical Guide*. Malden, MA: Blackwell Publishing.

Phillips, D. C. (1995). The Good, the Bad, and the Ugly: The Many Faces of

Constructivism. *Educational Researcher*, *24*(7), 5–12.

Rahimi, M., & Yadollahi, S. (2017). Effects of offline vs . online digital storytelling on the development of EFL learners ' literacy skills. *Cogent Education*, *2*(1), 1–13.

Raven, J., & O'Donnell, K. (2010). Using digital storytelling to build a sense of national identity amongst Emirati students. *Education, Business and Society: Contemporary Middle Eastern Issues*, *3*(3), 201–217.

Richey, R. C., & Klein, J. D. (2005). Developmental research methods: Creating knowledge from instructional design and development practice. *Journal of Computing in Higher Education*, *16*(2), 23–38.

Robin, B. (2006). The educational uses of digital storytelling. *... for Information Technology & Teacher Education ...*, 709–716.

Robin, B. R. (2008). Digital Storytelling: A Powerful Technology Tool for the 21st Century Classroom. *Theory Into Practice*, *47*(3), 220–228.

Robin, B. R. (2016). The Power of Digital Storytelling to Support Teaching and Learning. *Digital Education Review*, (30), 17–29.

Roby, T. (2010). Opus in the Classroom: Striking CoRDS with Content-Related Digital Storytelling. *Contemporary Issues in Technology and Teacher Education*, *10*, 133–144.

Rosen, H. (1986). The importance of story. *Language Arts*, *63*(3), 226–237.

Rubino, I., Barberis, C., & Malnati, G. (2018). Exploring the values of writing collaboratively through a digital storytelling platform: a mixed-methods analysis of users' participation, perspectives and practices. *Interactive Learning Environments*, *26*(7), 882–894.

Sarıtepeci, M. (2017). Ortaokul Düzeyinde Dijital Hikaye Anlatımının Yansıtıcı Düşünme Becerisi Üzerindeki Etkisinin İncelenmesine Yönelik Deneysel Bir Çalışma. *Bartın Üniversitesi Eğitim Fakültesi Dergisi*, 167–1384.

Sarıtepeci, M., & Durak, H. (2016). Bilgi Teknolojilerinin Temelleri Ünitesinin İşelnmesinde Dijital Hikaye Anlatımı Kullanımının Öğrenen Motivasyonuna Etkisi. *Journal of Research in Education and Teaching*, *5*, 258–265.

Sarica, H. Ç., & Usluel, Y. K. (2016). The effect of digital storytelling on visual memory and writing skills. *Computers and Education*, *94*, 298–309.

Savery, J. R. (2006). Overview of Problem-based Learning: Definitions and Distinctions. *Interdisciplinary Journal of Problem-Based Learning*, *1*(1).

Schank, R. C. (1995). *Tell Me a Story: Narrative and Intelligence*. Northwestern University Press.

Schank, R. C., Berman, T. R. & Macperson, K. A. (1999). *Learning by doing*. In C. M. Reigeluth (Ed.), Instructional Design Theories and Models: A New Paradigm of Instructional Theory (Vol. II) (pp. 161-181). Mahwah, NJ: Lawrence Erlbaum Associates.

Schmoelz, A. (2018). Enabling co-creativity through digital storyelling in education. *Thinking Skills and Creativity*, *28*(February), 1–13.

Schreiber, R., Crooks, D., & Stern, P.N. (1997). *Qualitative meta-analysis*. In J. M. Morse (Ed.), Completing a qualitative project: Details and dialogue (pp. 311–326). Thousand Oaks, CA: Sage

Seels, B. B., & Richey, R. C. (1994). *Instructional technology: The definition and domains of the field*. Washington, DC: Association for Educational communications and Technology.

Seo, J., & Park, E. (2009). Applying digital storytelling technique to website

navigation for improving emotional user experience. *Proceeding of the International Association of Societies of Design Research 2009, Seoul, Korea*, 4125–4128.

Sharp, H., Rogers, Y., & Preece, J. (2011). *Interaction design: Beyond human-computer interaction*. Chichester: Wiley.

Shorten, A., & Smith, J. (2017). Mixed methods research: expanding the evidence base. *Evidence Based Nursing*, *20*(3), 74–75.

Shortt, C. A., Webster, C. A., Keegan, R. J., Egan, C. A., & Brian, A. S. (2019). Operationally Conceptualizing Physical Literacy: Results of a Delphi Study. *Journal of Teaching in Physical Education*, *38*(2), 91–104.

Silen, C., & Uhlin, L. (2008). Self-directed learning - A learning issue for students and faculty! *Teaching in Higher Education*, *13*(4), 461–475.

Silseth, K. (2013). Surviving the impossible: Studying students' constructions of digital stories on World War II. *Learning, Culture and Social Interaction*, *2*(3), 155–170.

Skinner, E. N., & Hagood, M. C. (2008). Developing literate identities with English language learners through digital storytelling. *The Reading Matrix*, *8*(2), 12–38.

Smeda, N., Dakich, E., & Sharda, N. (2014). The effectiveness of digital storytelling in the classrooms: A case study. *Smart Learning Environments*, *1*(6), 1–21.

Spicer, S., & Miller, C. (2014). An exploration of digital storytelling creation and media production skill sets in first year college students. *International Journal of Cyber Behavior, Psychology and Learning*, *4*(1), 46–58.

Stacy, J., & Aguilar, J. (2018). Connection, Culture, & Creativity: Using Mobile Technology as a Medium for Storytelling in an Intergenerational Classroom. *Multicultural Education*, *25*(2), 28–35.

Starks, H., & Trinidad, S. B. (2007). Choose Your Method: A Comparison of Phenomenology, Discourse Analysis, and Grounded Theory. *Qualitative Health Research*, *17*(January 10), 1372–1380.

Sukovic, S. (2014a). iTell: Transliteracy and Digital Storytelling. *Australian Academic & Research Libraries*, *45*(3), 205–229.

Sukovic, S. (2014b). iTell: Transliteracy and Digital Storytelling. *Australian Academic and Research Libraries*, *45*(3), 205–229.

Svinicki, M. D. (2010). Student Learning: From Teacher-Directed to Self-Regulation. *New Directions for Teaching and Learning*, (119), 35–41.

Sylvester, R., & Greenidge, W. (2009). Digital Storytelling: Extending the Potential for Struggling Writers. *Reading Teacher*, *63*(4), 284–295.

Tahriri, A., Tous, M. D., & MovahedFar, S. (2015). The Impact of Digital Storytelling on EFL Learners â€™ Oracy Skills and Motivation. *International Journal of Applied Linguistics & English Literature*, *4*(3), 144–153.

Tang, X. (2009). Qualitative Meta-synthesis Techniques for Analysis of Public Opinions for in-depth Study, 2338–2353.

Thompson, A. D., & Mishra, P. (2007). Breaking News: TPCK becomes TPACK ! *Journal of Computing in Teacher Education*, *24*(2), 38–64.

Timulak, L. (2009). Meta-analysis of qualitative studies: a tool for reviewing qualitative research findings in psychotherapy. *Psychotherapy Research : Journal of the Society for Psychotherapy Research*, *19*(4–5), 591–600.

Tsiviltidou, Z. (2015). Digital storytelling with mobile media for inquiry-based museum learning: The student as author of the museum experience. *Proceedings of 2015 International Conference on Interactive Mobile Communication Technologies and Learning, IMCL 2015*, (November), 91–95.

Turan, T., & Seker, B. S. (2018). The Effect of Digital Stories on Fifth-Grade Students' Motivation. *Journal of Education and Future-Egitim Ve Gelecek Dergisi*, (13), 65–78.

Vogler, J. S., Thompson, P., Davis, D. W., Mayfield, B. E., Finley, P. M., & Yasseri, D. (2018). The hard work of soft skills: augmenting the project-based learning experience with interdisciplinary teamwork. *Instructional Science*, *46*(3), 457–488.

von Weltzien Hoivik, H. (2004). The Concept of Moral Imagination - an Inspiration for Writing and Using Case Histories in Business Ethics? *Journal of Business Ethics Education*, *1*(1), 29–42.

Voogt, J., & Roblin, N. P. (2012). A comparative analysis of international frameworks for 21stcentury competences: Implications for national curriculum policies. *Journal of Curriculum Studies*, *44*(3), 299–321.

Wake, D. G. (2012). Exploring rural contexts with digital storytelling. *Rural Educator*, *33*(3), 23–37.

Walsh, D., & Downe, S. (2005). Meta-synthesis method for qualitative research : a literature review. *Journal of Advanced Nursing*, *50*(2), 204–211.

Wang, S., & Zhan, H. (2010). Enhancing Teaching and Learning with Digital Storytelling. *International Journal of Information and Communication Technology Education (IJICTE)*, *6*(2), 76–87.

Whalley, L. J. (2006). *Nurtients and Aging.* In Handbook of Models for Human Aging.

Williams, K. E. (2018). Moving to the Beat: Using Music, Rhythm, and Movement to Enhance Self-Regulation in Early Childhood Classrooms. *International Journal of Early Childhood*, *50*(1), 85–100.

Lipsey, M., & Wilson, D. (2001). *Practical meta-analysis*. Thousand Oaks, CA: Sage.

Wong, L. (2007). Summarizing research findings: systematic review and meta-analysis. *Malaysian Family Physician : The Official Journal of the Academy of Family Physicians of Malaysia*, *2*(1), 8–12.

Xu, Y., Park, H., & Baek, Y. (2011). A new approach toward digital storytelling: An activity focused on writing self-efficacy in a virtual learning environment. *Educational Technology and Society*, *14*(4), 181–191.

Yamaç, A., & Ulusoy, M. (2016). The Effect of Digital Storytelling in Improving the Third Graders Writing Skills. *International Electronic Journal of Elementary Education*, *9*(1), 59–86.

Yang, Y.-T. C., & Wu, W.-C. I. (2012). Digital storytelling for enhancing student academic achievement, critical thinking, and learning motivation: A year-long experimental study. *Computers & Education*, *59*(2), 339–352.

Yearta, L., Helf, S., & Harris, L. (2018). Stories Matter: Sharing our Voices with Digital Storytelling. *Texas Journal of Literacy Education*, *6*(1), 14–22.

APPENDICES

APPENDIX A: List of Analyzed Digital Storytelling Research Studies

Articles:

1. Oakley, G., Pegrum, M., Xiong, X.B., Lim, C. P. & Yan, H. (2018). An online Chinese-Australian language and cultural exchange through digital storytelling. *Language, Culture and Curriculum, 31*(2), 128-149.

2. Stacy, J. & Aguilar, J. (2018). Using Mobile Technology as a Medium for Storytelling in an Intergenerational Classroom. *Multicultural Education, 25*(2), 28–35.

3. Anderson, J., Chung, Y., & Macleroy, V. (2018). Creative and critical approaches to language learning and digital technology: findings from multilingual digital storytelling Project. *Language and Education, 32*(3), 195-211.

4. Jessica, C. & Yunus, M. (2018). Digital Storytelling Production as a Learning Tool in Improving ESL Learners' Verbal Proficiency. *Asian EFL Journal 20*(5), 131-141.

5. Liu, M., Huang, Y. & Xu, Y. (2018). Effects of individual versus group work on learner autonomy and emotion in digital storytelling. *Educational Technology Research and Development, 66*(4), 1009-1028.

6. Schmoelz, A. (2018). Enabling co-creativity through digital story telling in education. *Thinking Skills and Creativity, 28*, 1-13.

7. Liu, K., Tai, S. D., & Liu, C. (2018). Enhancing language learning through creation: the effect of digital storytelling on student learning motivation and performance in a school English course. *Educational Technology Research and Development, 66*(4), 913-935.

8. Rubino, I., Barberis, C., & Malnati, G. (2018). Exploring the values of writing collaboratively through a digital storytelling platform: a mixed-methods analysis of users' participation, perspectives and practices. *Interactive Learning Environments, 26*(7), 882-894.

9. Damavandi, Z. M., Hassaskhah, J., & Zafarghandi, A. M. (2018). The Effects of Computer Assisted Mediating Prompts on EFL Learners' Writing Ability. *International Journal of Education and Literacy Studies, 6*(1), 64-71.

10. Turan, T. & Şeker, B. C. (2018). The Effect of Digital Stories on Fifth-Grade Students' Motivation. *Journal of Education and Future-Egitim Ve Gelecek Dergisi*, (13), 65–78.

11. Yilmaz, F.G., Özdemir, B. & Yasar, Z. (2018). Using digital stories to reduce misconceptions and mistakes about fractions: an action study. *International Journal of Mathematical Education in Science and Technology*, *49*(6), 867-898.

12. Kotluk, N. & Kocakaya, S. (2017). The Effect of Creating Digital Storytelling on Secondary School Students' Academic Achievement, Self-Efficacy Perceptions and Attitudes Toward Physics. *International Journal of Research in Education and Science, 3*(1), 218-227.

13. Staley, B. & Freeman, L. (2017). Digital storytelling as student-centered pedagogy: empowering high school students to frame their futures. *Research and Practice in Technology Enhanced Learning*, *12*(1), 1-18.

14. Bashirnezhad, H. & Yousefi, A. (2017). Digital storytelling listening influence on Iranian intermediate EFL learners' pronunciation. *Revista QUID, (Special Issue)*, 1702-1707.

15. Özpınar, İ., Gökçe, S. & Yenmez, A. A. (2017). Effects of Digital Storytelling in Mathematics Instruction on Academic Achievement and Examination of Teacher-Student Opinions on the Process. *Journal of Education and Training Studies, 5*(10), 137-149.

16. Sarıtepeci, M. (2017). Ortaokul Düzeyinde Dijital Hikaye Anlatımının Yansıtıcı Düşünme Becerisi Üzerindeki Etkisinin İncelenmesine Yönelik Deneysel Bir Çalışma. *Bartın Üniversitesi Eğitim Fakültesi Dergisi, 6*(3), 1367-1384.

17. Öztürk, A. & Tunç, Ö. A. (2017). The effect of digital storytelling project on fine arts high school students' teamwork skills. *Journal of Educational and Instructional Studies in the World, 7*(4), 58-68.

18. Baki, Y. & Feyzioglu, N. (2017). The Effects of Digital Stories on the Writing Skills of 6th Grade Students. *International Online Journal of Educational Sciences, 9*(3), 686-704.

19. Pieterse, G. (2018). To see someone else's perspective: A case for digital stories in schools. *Independent Journal of Teaching and Learning, 13*(1), 41-56.

20. Rahimi, M. & Yadollahi, S. (2017). Effects of offline vs. online digital storytelling on the
development of EFL learners' literacy skills. *Cogent Education, 2*(1), 1-13.

21. Hung, C., Hwang, G. & Huang, I. (2012). A Project-based Digital Storytelling Approach for Improving Students' Learning Motivation, Problem-Solving Competence and Learning Achievement. *Educational Technology & Society, 15*(4), 368–379

22. Saritepeci, M. & Durak, H. (2016). Bilgi teknolojilerinin temelleri ünitesinin işlenmesinde dijital hikâye anlatimi kullaniminin öğrenen motivasyonuna etkisi. *Journal of Research in Education and Teaching, 5*(Special Issue), 258-265.

23. Bjorgen, A. M. (2010). Boundary crossing and learning identities – digital storytelling in primary schools. *Seminar.net. International Journal of Media, Technology & Lifelong Learning, 6*(2), 161-178.

24. Bogard, J. M. & McMackin, M. C. (2012). Combining traditional and new literacies in a 21st-century writing workshop. *The Reading Teacher, 65*(5), 313-324.

25. Bissel, A. & Korteweg, L. (2016). Digital Narratives as a Means of Shifting Settler-Teacher Horizons toward Reconciliation. *Canadian Journal of Education/Revue canadienne de l'éducation, 39*(3), 1-24.

26. Sadik, A. (2008). Digital storytelling: a meaningful technology-integrated approach for engaged student learning. *Educational Technology Research and Development, 56*(4), 487-506.

27. Gregori-Signes, C. (2014). Digital Storytelling and Multimodal Literacy in Education. *Porta Linguarum, 22*(1), 237-250.

28. Alrutz, M. (2015). Digital Storytelling and Youth: Toward Critically Engaged Praxis. *Youth Theatre Journal, 29*(1), 1-14.

29. Blas, N. D., Garzotto, F., Paolini, P., Sabiescu, A. (2009). Digital Storytelling as a Whole-Class Learning Activity: Lessons from a Three-Year Project. *International Conference on Interactive Digital Storytelling*, 2009, pp. 14-25.

30. Mantei, J. & Kervin, L. (2016). Digital storytelling: Capturing children's participation in preschool activities. *Issues in Educational Research, 26*(2), 225-241.

31. Mnisi, T. (2015). Digital storytelling: Creating participatory space, addressing stigma, and enabling agency. *Perspectives in Education, 33*(4), 92-107.

32. Yang, Y. C. & Wu, W. I. (2012). Digital storytelling for enhancing student academic achievement, critical thinking, and learning motivation: A year-long experimental study. *Computers & Education, 59*(2), 339-352.

33. Campbell, T. A. (2012). Digital storytelling in an elementary classroom: Going beyond entertainment. *Procedia - Social and Behavioral Sciences 69*(2012), 385 – 393.

34. Niemi, H. & Multisilta, J. (2016). Digital storytelling promoting twenty-first century skills and student engagement. *Technology, Pedagogy and Education, 25*(4), 451-468.

35. Kulla-Abbott, T. & Polman, J. L. (2008). Engaging student voice and fulfilling curriculum goals with digital stories. *Technology, Humanities, Education, & Narrative, 1*(5), 38-60.

36. Tsai, C., Shen, P. & Lin, R. (2015). Exploring the Effects of Student-Centered Project-Based Learning with Initiation on Students' Computing Skills: A Quasi-Experimental Study of Digital Storytelling. *International Journal of Information and Communication Technology Education, 11*(1), 27-43.

37. Gresham, P. (2014). Fostering Creativity through Digital Storytelling. *mETAphor, 1*(1), 47-55.

38. Burke, A. & Hardware, S. (2015). Honouring ESL students' lived experiences in school learning with multiliteracies pedagogy. *Language, Culture and Curriculum, 28*(2), 143-157.

39. Valdivia, A. & Medina, L. (2014). Looking and Not Seeing the Difference: An intercultural media education experience in Chile. *Procedia - Social and Behavioral Sciences, 132*(2014), 479-485.

40. Angay-Crowder, T., Choi, J. & Yi, Y. (2013). Putting Multiliteracies into Practice: Digital Storytelling for Multilingual Adolescents in a Summer Program. *TESL Canada Journal, 30*(2), 36-45.

41. Rolón-Dow, R. (2011). Race(ing) stories: digital storytelling as a tool for critical race scholarship. *Race Ethnicity and Education, 14*(2), 159-173.

42. Silseth, K. (2013). Surviving the impossible: Studying students' constructions of digital stories on World War II. *Learning, Culture and Social Interaction, 2*(3), 155-170.

43. Aitkuzhinova-Arslan, A., Gün, S. & Üstünel, E. (2016). Teaching vocabulary to Turkish young learners in semantically related and semantically unrelated sets by using digital storytelling. *Journal of Language and Linguistic Studies, 12*(1), 42-54.

44. Kocaman-Karoglu, A. (2015). Telling stories digitally: an experiment with preschool children. *Educational Media International, 52*(4), 340-352.

45. Yamaç, A & Ulusoy, M. (2016). The Effect of Digital Storytelling in Improving the Third Graders' Writing Skills. *International Electronic Journal of Elementary Education, 9*(1), 59-86.

46. Sarica, H. & Usluel, Y. (2016). The effect of digital storytelling on visual memory and writing skills. *Computers and Education, 94*(2016), 298-309.

47. Nam, C. W. (2016). The effects of digital storytelling on student achievement, social presence, and attitude in online collaborative learning environments. *Interactive Learning Environments, 25*(3), 412-427.

48. Tahriri, A., Tous, M. D. & Movahedfar, S. (2015). The Impact of Digital Storytelling on EFL Learners' Oracy Skills and Motivation. *International Journal of Applied Linguistics & English Literature, 4*(3), 144-153.

49. Karakoyun, F. & Kuzu, A. (2016). The Investigation of Preservice Teachers' and Primary School Students' Views about Online Digital Storytelling. *European Journal of Contemporary Education, 15*(1), 51-64.

50. Burke, Q. & Kafai, Y. B. (2012). The Writers' Workshop for Youth Programmers Digital Storytelling with Scratch in Middle School Classrooms. *Special Interest Group on Computer Science Education* (2012), 433-438.

51. Anderson, K. T. & Weninger, C. (2012). Tracing ideologies of learning in group talk and their impediments to collaboration. *Linguistics and Education, 23*(2), 350-360.

52. Papadopoulou, S. & Vlachos, K. (2014). Using digital storytelling to develop foundational and new literacies. *Research Papers in Language Teaching and Learning, 5*(1), 235-258.

53. Fokides, E. (2016). Using Digital Storytelling to Help First-Grade Students' Adjustment to School. *Contemporary Educational Technology, 7*(3), 190-205.

54. Batsila, M. & Tsihouridis, C. (2016). "Once upon a Time there was…" A Digital World for Junior High School Learners. *International Journal of Emerging Technologies in Learning 11*(3), 42-50.

55. Castaneda, M. E. (2013). "I am proud that I did it and it's a piece of me": Digital Storytelling in the Foreign Language Classroom. *CALICO Journal, 30*(1), 44-62.

Dissertations:

56. Baki, Y. (2015). Dijital öykülerin altinci sinif öğrencilerinin yazma sürecine Etkisi.

57. Ciğerci, F. M. (2015). İlkokul dördüncü sinif türkçe dersinde dinleme becerilerinin geliştirilmesinde dijital hikâyelerin kullanilmasi.

58. Demirer, V. (2013). İlköğretimde e-öyküleme kullanimi ve etkileri.

59. Çiçek, M. (2018). Investigating the effects of digital storytelling use in sixth-Grade science course: a mixed method research study.

60. Kahraman, Ö. (2013). Dijital hikayecilik metoduyla hazirlanan öğretim materyallerinin öğrenme döngüsü giriş aşamasinda kullanilmasinin fizik dersi başarisi ve motivasyonu düzeyine etkisi.

APPENDIX B: Interview Protocol for Field Experts

Interview Questions

1. How would you describe Digital Storytelling?
2. What kind of an approach do you think Digital Storytelling is in terms of learning and teaching?
3. How can Digital Storytelling be integrated into learning and instruction?
4. According to you, what are the advantages and disadvantages of Digital Storytelling?
5. What do you think about the significance of this research? What can scientific research on Digital Storytelling contribute to the related literature?
6. What should researchers aim in Digital Storytelling studies?
7. What research questions should be posed in Digital Storytelling studies?
8. Which theoretical or conceptual framework fits the Digital Storytelling studies? Which theories can guide Digital Storytelling studies?
9. As it is known, digital stories should involve 7 key steps according to the Center for Digital Storytelling. To what extent do you think these elements are considered by researchers? What is the importance of these elements?
10. What do think about the effectiveness of the 4 step approach to Digital Storytelling developed by Robin?
11. In addition to key steps developed by Center for Digital Storytelling and Robin, what points should be considered during the implementation of Digital Storytelling?
12. The analysis of the findings show that Digital Storytelling approach is generally used or studied in language education context. What do you think about this? In which other courses or subject areas can Digital Storytelling approach be implemented? How?
13. It is seen that research on digital storytelling approach has mainly focused on motivation, academic achievement, and attitude variables. What other variables do you think can be studied?
14. Which research methods can be preferred in Digital Storytelling studies?
15. What is the grade level or age group that Digital Storytelling approach is more suitable or effective for?
16. Which data gathering methods or tools can be used in Digital Storytelling studies?
17. In which areas can Digital Storytelling have implications?
18. How Digital Storytelling is affected by technological developments?
19. Is digital storytelling a widely known and practiced approach? What can you say about the future of this approach?

Görüşme Soruları

1. Dijital hikaye anlatımını (DHA) kendi ifadelerinizle tanımlayacak olsanız ne söylerdiniz?
2. Sizce Dijital hikaye anlatımı öğrenme-öğretme açısından nasıl bir yaklaşımdır?
3. Dijital hikaye anlatımı eğitim/öğretime nasıl entegre edilebilir?
4. Dijital hikaye anlatımının size göre avantajları ve dezavantajları nelerdir?
5. Dijital hikaye anlatımı bilimsel anlamda çalışıldığında literatüre ne tür katkısı olabilir? Bu çalışmaların önemi nedir?
6. DHA çalışmalarında araştırmacılar neyi amaçlamalıdır?
7. İncelediğiniz bulgular üzerinden konuşacak olursak, sizce DHA çalışmalarında araştırma sorusu bağlamında ne sorgulanmalıdır?
8. DHA çalışmaları nasıl bir kuramsal/kavramsal çerçeveye oturtulabilir? Hangi kuramlar DHA çalışmalarına yön verebilir?
9. Bilindiği gibi DHA merkezinin belirlediği dijital hikayelerin bulundurması gereken 7 temel unsur var. Sizce bu unsurlar ne derecede araştırmacılar tarafından dikkate alınıyor? Bu unsurların önemi nedir?
10. Robin'in belirlemiş olduğu üzere dijital hikaye oluşturmada bazı aşamalar söz konusudur. Sizce bu adımların DHA'na katkısı nedir?
11. DHA merkezinin ve Robin'in unsurları veya adımlarına ek olarak DHA uygulama konusunda dikkat edilmesi gereken noktalar nelerdir?
12. Bulgular incelendiğinde DHA yaklaşımının daha çok dil eğitimi derslerinde kullanıldığı görülmektedir. Sizce bu yaklaşım doğru mudur? Başka hangi derslerde veya konu alanlarında uygulanabilir? Nasıl?
13. DHA yaklaşımının daha çok motivasyon, başarı ve tutum değişkenleri üzerine çalışıldığı görülmektedir. Sizce başka hangi değişkenler incelenebilir?
14. DHA çalışmalarında hangi araştırma yöntemleri tercih edilebilir?
15. Sizce hangi yaş grubu için DHA yaklaşımı daha uygundur veya daha etkin kullanılabilir?
16. DHA çalışmalarında ne tür veri toplama araçları kullanılabilir?
17. DHA etkili olacağı alanlar nelerdir?
18. DHA teknolojik gelişmelerden nasıl etkilenmektedir?
19. DHA sizce çok bilinen ve uygulanan bir yaklaşım mıdır? Bu yaklaşımın geleceği hakkında ne söylersiniz?

APPENDIX C: Coding Scheme for Meta-Synthesis Part (Sample)

Aim of the study

- Adaptation to the school environment
- Attitude
- bring about change
- Building relationship among students
- Comparing DST experience in/outside School
- conceptual understanding
- creative writing
- critical engagement with history
- Critical Thinking
- Engagement
- engaging teaching/learning with real life
- exploring the way learners reveal their identity representation
- Facilitating critically engaged performance pedagogy
- Formation of Learning Identity
- Improving a critical socio-educational focus
- Improving Computing skills
- Improving teaching/learning
- inspecting the way students participate in school environment
- Investigating Interactions among peers
- Learning Achievement
  - Writing
  - Reading
  - Listening
- Learning Strategies
- make learners to take action
- Motivation
- multiliteracy practice
- Multimodal skills
- Oracy Skills
- overcoming racism
- presenting experience of DST project
- Problem Solving Competence
- Proposing Project-Based DST
- Self-Efficacy
- social presence
- Visual Memory Capacity

Significance of the Study

introducing the DST method
improving listening skills and attitudes
showing how to use DST in language education
providing new perspective for story creation
providing DST implications for instructors/ins. designers
increasing interactions in online collaborative environments
promoting/facilitating technology integration

Sampling Method

participation requirements

Theoretical framework

Reflective Thinking
Active Learning
inquiry-based learning
Constructionism
critical literacy theory
Learner-centered policy
self-directed learning
scaffolding theory
community of practice
New Literacy theory
dialogical perspective
sociocultural approach/theory
cognitive apprenticeship
Symbolic Interactionism
Legitimate Peripheral Participation Theory
Situated Learning Theory
Double-Diamond Design Process Model
Critically Engaged Performance Pedagogy
Situated Cognition Theory
Cognitive Developmental Theory
Constructivism
Social Constructivism
Ecological Systems Theory
Critical Race Theory (CRT)
Multiliteracies pedagogy
mastery and appropriation
Global Sharing Pedagogy (GSP)

Research Questions

Pronunciation

learning strategies
Listening Skills
self-efficacy
perception
current state of DST knowledge
opinions about creating DST
Reading skills
Educational Benefits of DST
opinions about DST environment
21st century skills
Oracy Skills
Attitude
social presence
Visual Memory Capacity (VMC)
narrative writing
Quality of DST
writing performance/skills
conceptual understanding of content
creative writing
literacy skills
engagement
critical thinking
opinions about integration of DST
technology integration
authentic learning tasks
Learning Identity & Agency
comparing outcomes among genders
Achievement
Problem Solving
Motivation

Research Methodology

narrative inquiry
critical ethnography
Phenomenology
community-based participatory research
mixed method
Photovoice and teacher research
(quasi-) experiment
action research
case study

Instruments/Data Collection

- Software
- Documentary
- Demographic Info Form
- Focus Group Discussion
- Reflection Journal
- Online forum and blog
- Questionnaire
- Inquiry
- Survey
- Learner Artifacts
- Video Record
- Audio Record
- Field Notes
- Scales
- Observations
- Rubrics
- Interviews

Main Findings

- self-efficacy for science
- gender effect
- Attitude
- critical thinking skills
- communication skills
- problem-solving skills
- binding learning with real life
- self-reflection
- instructive
- self-awareness
- correction of misconceptions
- creativity/creative thinking
- commitment
- co-creativity
- entertaining
- valence
- Anxiety
- Self-Control for Learning
- Motivation
- Technical/ICT Skills
- Active/Authentic Learning

Digital Literacy

Further Studies

Research

DST effect on Learning Outcomes

increasing involvement of learners

different contents in same subject

Other Subject areas

Implementation

collaborative DST creation platforms

Scaffolding during DST creation

using different instructional stratgies

peer/group work

Participants

larger samples

different grade levels

different contexts

learning styles/strategies

APPENDIX D: Coding Scheme for Experts Interview Part (Sample)

DST Definition

- **Properties of DST**
  - Importance of Story
  - Effectiveness of digitalizing
    - visual richness
    - high rate of re-usability
  - Prioritizing some elements
    - prioritizing voice
    - prioritizing narrative
    - prioritizing solidarity
  - stimulating emotions
  - co-creativeness
  - around a theme
  - sharing enabler structure
  - importance of technology
  - enabling association for remembering
  - importance of story circle
  - uniqueness
- **Reflecting own-voice**
  - reflecting emotions
  - telling real life experience
  - self-expression
  - personal narratives
  - own voice
  - reflecting ideas
  - self-selected visuals
- **Process of digitalizing the story**
  - Enhancing with Technology
    - combining with technology
    - multi-media
    - computerization
  - DST Storage Environment
    - web-page
    - in computer
- **Conceptualizing of DST**
  - DST is a process
  - aesthetical form of writing with current technologies

- It's not an approach
- combining visual and audial expression
- not to use DST as a tool
- nonhierarchical process
- creation of a short story

Facilitator Characteristics

- make people externalize their narratives
- encourage participants
- Understanding media theory
- Understanding philosophical background
- Considering student properties
- Considering class context
- give importance to experience not topic
- being ready for every condition
- having a clear mind
- not to intervene students in process
- experience of facilitators

Creation Process

- Procedural
  - following certain steps
  - elimination of storyboard
  - flexibility of transitions among steps
  - self-management of story creation
  - respectively use of steps
- Group Work
  - give importance to co-creativeness
  - interactions among people
  - in a specific group
- copyright issue
- Sharing Stories
  - circulating narratives

Considerations in story forms

- putting into a pattern
- contextual telling
- putting into meaningful sequence
- binding with real life
- Contextualization to remember

Problems-Limitations

- concept conflict
- wrongly use of DST

not a good tool for math and science
misuse of DST
limiting topic selection

Types of DST

historical stories
instructional stories
personal stories

DST approach in terms of learning and Instruction

Benefits

Reflecting Own-Voice

easing self-expression
real life experience
sharing own story
self-reflection
releasing own voice
student independency
telling personal narrative
rescuing from mono-type
promotes decision making

Product Creation

creation of a unique product
Sense of ownership
bonding with real life
combining emotions and ideas
importance of DST creation as a process
Being Productive

Enhance Social Sturcture of Learning Environment

increasing participation
communication skills
unhierarchical structure inside
encouraging
socializing
telling story among equals

Cognitive Development/Dimension

increasing self-awareness
learning transfer
promotes creativity
operating brain actively

Facilitates Knowledge and Skill Development

21st century skills

- Occupational Skills
- technological skills

Promotes Learning
- contributing learning
- learning by doing
- Contextual Learning
- learning transfer
- effective for learning
- students use their own knowledge

Sharing Knowledge
- sharing information
- learning from each other
- make sense of other DSTs

Ameliorates Teaching
- instructional tool
- Ameliorates teachers
- ameliorating discussions on educational contents

Evaluation Purpose
- use for evaluation
- reflections on teaching-learning

Promotes engagement
- a way to engage learners

Integration of DST

Suggestions for Integration

Subject Related Issues
- Convenient for all subjects
  - not to restrict with language education
  - to be used in different areas
  - adaptability to various disciplines
  - can be integrated in many fields
  - to be worked in different disciplines
  - Suitable for every subjects
  - can be used in every subject areas
  - can be used in many disciplines
- interdisciplinary use
- Appropriate for Complex Contents

the way of DST integration
- showing prepared DST
- students developed DST

instructor developed DST

Convenient for all stages of instruction

specific section of lesson

at the end of lesson

at the beginning of the lesson

throughout the term

at the end of the units

throughout the lesson

need for in-service training

defining focus point of DST creation

both process and product

process-based

product-based

Grade Level

Pre-School and Elementary levels

to be worked in differnet grade levels

All levels

considering how to integrate DST

knowing how to use DST

Careful planning

improve technological infrastructure

Determinants of Integration

Barriers for integration

stereotyped thoughts

technological infrastructure

disregarding importance of story writing process

time consuming

overloading for teachers

factors that effect integration process

Policy

Educational Policy

management of country

government programs

educational politics

non-hierarchical classroom policy

Educational System and Curriculum

instructional curriculum

components of educational system

teachers' efficacy

Enablers of Integration

prevalence of technology
easy to create DST
popularity of learning with technology

Goals for Integration

promote learning

acquiring goals of particular discipline
make students experience process
transferring information
use for summing-up lesson
bridging theory and practice
facilitate discussion to get feedback

Motivation/Attention

promoting students' motivation
attracting attention

CURRICULUM VITAE

PERSONAL INFORMATION

Surname, Name	: Öz, Saba
Nationality	: Turkish (TC)
Date and Place of Birth	: 9 Kasım 1983, Ankara
Phone	: +90 506 456 91 25
E-mail	: ozsaba@gmail.com

EDUCATION

Degree	Institution	Year of Graduation
MS	METU - Health Informatics	2012
BS	METU - Computer Education and Instructional Technology	2007
High School	Gazi Technical High School, Ankara	2001

WORK EXPERIENCE

Year	Place	Enrollment
2009 - 2019	METU – School of Foreign Languages	Computer Coordinator
2007 - 2009	BİTES Savunma, Havacılık ve Uzay Teknolojileri	Multimedia Software Expert

FOREIGN LANGUAGES

Advanced English

PUBLICATIONS

1. Yurdagül, C., Öz, S. (2018). Attitudes towards Mobile Learning in English Language Education. *Education Sciences, 8*(142), 32-45.