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The Effect of Rule-Based Scaffoldings on Second Grade Students' Digital Storytelling

Xue Wen

Louisiana State University and Agricultural and Mechanical College

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THE EFFECT OF RULE-BASED SCAFFOLDINGS ON SECOND GRADE STUDENTS' DIGITAL STORYTELLING

A Dissertation
Submitted to the Graduate Faculty of the
Louisiana State University and Agricultural and Mechanical College
in partial fulfillment of the requirements for the degree of
Doctor of Philosophy
in
The Department of Educational Leadership and Research

by
Xue Wen,
B.A., Sichuan University, 2010
M.Ed., Louisiana State University, 2012
May 2017

I would like to dedicate this dissertation to my loving husband Liliang and my son Ryan, my dear parents for their continued love, support and encouragement on my PhD journey. Thank you! I love you all!

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ABSTRACT

Digital storytelling is a powerful method for revitalizing literacy instruction. Past research suggested that digital storytelling activities improve students' writing skills through construction of various types of stories. However, little research has investigated in what ways educators can promote students' interests and actual abilities to express narrative discourse in a digital format. Recent research indicated that the use of story grammars help students develop sophisticated stories. From this perspective, Labov's story grammar emphasized two functions of good story structure: reference—the listeners (or readers) are told what happened, and evaluation—the speakers (or writers) reveal their attitude toward the events of the narrative. Meanwhile, current practitioner based research suggests that Lambert's seven elements approach of digital storytelling emerged as a practical guideline for creating effective digital stories in elementary classrooms. Therefore, the purpose of this study was to investigate the potential of three instructional approaches: Labov's story grammar only, Lambert's seven elements only, and both instructional approaches, as scaffolding(s) for students' digital storytelling. Specifically, a quantitative research design with three experimental groups and one control group, pre-test and post-test, was employed. Participants included 104 second-graders (largely from high socioeconomic status families), with 26 in each of four classrooms. Therefore, the three instructional scaffold approaches and one non-scaffold supported approach were randomly assigned to each of four classrooms respectively to support students' story writing, storytelling, story design and construction using Movie Maker software. Students' understanding of narrative writing was assessed before and after the implementation of the intervention. The results indicated that the instructional scaffolding positively enhanced students' performance in story writing, storytelling, and verbal and visual expression. In particular, the story grammar

scaffolding motivated students to produce coherent, more sophisticated stories. The seven elements scaffolding sparked students' creative verbal and visual expressions and stimulated them to elaborate using a variety of adjectives in their digital stories. When both scaffolding approaches were implemented, students significantly outperformed the other groups on the quality of story content, story coherency and narrative knowledge. The implications of these findings and recommendations for future research are discussed.

Chapter 1: INTRODUCTION

Children love stories. They love to listen to them, read them, invent them, and write them. They always have. Storytelling, as an ancient form of education, inspires and motivates children to learn more new concepts and link them to their lives (Lambert, 2007; Lambert, 2013; Porter, 2005; Robin, 2006; Robin, 2008). Nowadays, with the rapid development of digital technology, people has integrated the ancient art of oral storytelling with a palette of technical tools to weave personal tales using images, music and sound mixed together with the researcher's own story voice, they gave its name as "digital storytelling" (Porter, 2005). Digital storytelling is narrative entertainment that reaches its audience via digital technology and media—microprocessors, wireless signals, the Web, DVDs, and etc. (Porter, 2005; Porter, 2006). While any products—slideshows, filmmaking, photo essays, or websites—using any multimedia are technically called digital stories, digital storytelling is a special genre organized around using the author's own voice as the centerpiece of content while artistically dancing multisensory elements into personal understanding about self, family, knowledge, culture, ideas, events, or experiences (Porter, 2005). As we tell our own personal stories of what we know and understand, digital storytelling gives us a chance to offer our own learning as an extraordinary insight for others who may have had similar experiences. A good story lives inherent drama (Ibarra & Lineback, 2005). A good story incorporates technology in artful ways demonstrating craftsmanship in communicating with images, sound, voice, color, white space, animations, design, transitions, and special effects (Porter, 2006). A good digital storytelling is extremely powerful, making highly personal experiences and understandings come alive for others, using magic words to guide, motivate, teach, inspire, and influence (Lambert, 2013; Porter, 2005).

Numerous current research focusing on students' literacy experiences has demonstrated their instructional practices with digital storytelling (Flaherty & Glantz, 2014; Czarnecki, 2009;

Gakhar & Thompson, 2007; Gregory, Steelman & Caverly, 2009; Huang, Hwang & Huang, 2012; Isbell, Sobol, Lindaeur & Lowrance, 2004; Lambert, 2013; Liu, Wu, Chen, Tsai & Lin, 2014; Liu, Liu, Chen & Liu, 2010; Morgan, 2014; Robin, 2008; Sarica & Usluel, 2016; Shelby-Caffey, Ubeda & Jenkins, 2014; Thang, Lin, Mahmud, Ismail, Zabidi, 2014; Xu, Park & Baek, 2011; Yang & Wu, 2012; Yuan & Bakin-Aaker, 2015). Empirical studies have suggested that digital storytelling benefits students from various aspects: creativity (Czarnecki, 2009; Flaherty & Glantz, 2014; Gakhar & Thompson, 2007; Lambert, 2013; Liu et al., 2014; Xu et al., 2011; Yuan & Bakin-Aaker, 2015), multiple literacy skills (including researching, writing, organizing, presenting, problem solving and assessment) (Huang et al., 2012; Robin, 2008; Morgan, 2014; Sarica & Usluel, 2016; Shelby-Caffey et al., 2014), listening and comprehension skills (Gregory et al., 2009), oral language complexity (Isbell et al., 2004), motivation (Huang et al., 2012), attitude (Thang et al., 2014), perception (Liu et al., 2010), visual memory (Sarica & Usluel, 2016), reading (Morgan, 2014), critical thinking (Yang & Wu, 2012), academic achievement (Huang et al., 2012), emotional intelligence (Bratitsis & Ziannas, 2015) etc. For example, a project-based digital storytelling approach can promote fifth grade students' learning motivation, problem-solving competence, and learning achievement (Huang, Hwang & Huang, 2012). Elementary school students use and enhance their reading and writing skills during the creation of a story that ultimately plays out as a digital movie (Shelby-Caffey et al., 2014). Digital storytelling sparks students' artistic expression and creativity (Czarnecki, 2009; Flaherty & Glantz, 2014; Gakhar & Thompson, 2007; Lambert, 2013; Liu et al., 2014; Xu et al., 2011; Yuan & Bakin-Aaker, 2015).

A majority of current empirical studies attend to the connection between digital storytelling and writing (Sarica & Usluel, 2016; Xu et al., 2011). The main hypothesis is that digital storytelling will enhance students' writing skills. From this perspective, researchers

attempted to prove that writing is an important component of the process of creating digital stories (Sarica & Usluel, 2015; Xu et al., 2011). As a matter of fact, digital storytelling is an effective tool for students in the classroom (Robin, 2008), not only in the aspect of literacy instruction, but also in other disciplines (mathematics, science, etc.) (Starcic, Cotic, Solomonides & Volk, 2016). However, writing is not the final product of a digital story; a good digital story needs more craftsmanship in decorating the story (Lambert, 2013; Porter, 2006). Although most researchers and practitioners deemed digital storytelling as a tool to develop students language skills, writing skills, and different kinds of skills or literacy competences, seldom studies care about in what ways we can nurture young children to be good digital storytellers reflecting their full intellectual, emotional, and personal engagement with the subjects—not just a reporting of facts and information. So, what are the characteristics of a good digital story?

Joe Lambert and the late Dana Atchley helped create the digital storytelling movement in the late 1980s as cofounders of the Center for Digital Storytelling (“Story Center” now), a nonprofit, community arts organization in Berkeley, California. Since the early 1990s, the Story Center has provided training and assistance to people interested in creating and sharing their personal narratives (Center for Digital Storytelling, 2005). The Story Center is also known for developing and disseminating the Seven Elements of Digital Storytelling, which are often cited as a useful starting point to begin working with digital stories (Robin, 2008). During the first few years of workshops in Story Center, Lambert and his colleagues keep discussing with participants what made a story a digital story, and what made a digital story a good digital story. They came up with seven elements that outlined the fundamentals of digital storytelling and discovered that formally presenting them at the beginning of workshops greatly improved the process and the stories told. Nowadays, the dissemination of seven elements has expanded to elementary classrooms (Bull and Kajder, 2004; Shelby-Caffey et al., 2014).

Shelby-Caffey et al., (2014) explained the seven elements of digital storytelling in a classroom setting:

1. Point of view: stories should be told to make a point and perspective to your audience at the beginning.
2. Dramatic question: there should be a key question that works to pique audiences' interests.
3. Emotional content: adding your emotions into a storyline that draws the audience in and stirs an emotional connection.
4. Economy: carefully crafting a script that sharpen the focus of story and deciding what is essential to the story, avoid overloading your audience.
5. Pacing: managing a rhythm that keeps the audience interested
6. The gift of voice: a way to use your voice to tell your story.
7. Soundtrack: properly incorporate music in your story to add complexity and depth to the narrative.

Based upon the explanation of seven elements, Shelby-Caffey et al., (2014) stated “Stories that are crafted in line with Lambert’s seven elements attend to the personal connection between the storyteller/maker and the audience” (p.193). Writing a good script makes the digital story more interesting and effective. However, creating and telling a story that resonates is not easy (Ibarra & Lineback, 2005), students often spend more “digital” time searching for images and audio files rather than on the story (Robin, 2007, as cited in Xu et al., 2011). A good storyteller needs a good story to tell. Of course, a good story has inherent drama consisting of key elements: 1. a protagonist the listener cares about; 2. a catalyst compelling the protagonist to take action; 3. Trials and tribulations; 4. A turning point; 5. A resolution (Ibarra & Lineback, 2005). Novice storytellers often attempted to shoehorn the story elements into a two-minute

digital story by narrating it as rapidly as they can (Bull and Kajder, 2004; Porter, 2005). They always neglect what are most important characteristics in a good story (Bull and Kajder, 2004; Kajder, Bull & Albaugh, 2005). So, what makes a good story?

Past researchers described stories as composed of episodes or story grammars (Labov, 1972; Labov, 1997; Stein & Glenn, 1979; McCabe & Peterson, 1984), emphasizing goals and activities to achieve them. Labov and his colleagues (Labov, 1972; Labov, 1997; Labov & Waletzky, 1967) believed a good narrative is structure around “high points” or “suspension points”. Two function in narratives were emphasized: reference—the listener (or readers) were told what happened, and evaluation—the speakers (or writers) revealed their attitude toward the events of the narrative (Labov, 1972; McCabe & Peterson, 1984; Pearson & de Villiers, 2005). Deese’s dependency analysis (1983) indicated the linguistic complexity, and, in particular, the way propositions are related to each other through a relationship of either coordination or subordination (McCabe & Peterson, 1984). Some people may feel that all good stories have a characteristic so basic and necessary it’s often assumed, that quality is coherence (Ibarra & Lineback, 2005). Coherent narratives hang together in ways that are natural and intuitive. However, student writers are still learning how to write creatively and organize the story elements in a coherent way.

Therefore, a digital story likewise traditional story has its structure, the beginning, the middle, and the end. We may say “a good story is expressed a personal meaning or insight about how a particular event or situations touches you, your community, or humanity. A good story creates intrigue or tension around situation that is posed at the beginning of the story and resolved at the end, sometimes with an unexpected twist. A good story has a destination—a point to make—and seeks the shortest path to its destination. A good story uses vivid details to reveal feelings and information rather than just saying something is tall, happy, scary, or difficult to do.”

(Lambert, 2007). When a good story incorporates with technology in artful ways, it demonstrated craftsmanship in communicating with images, sound, voice, color, white space, animations, design, transitions, and special effects, beyond words (Porter, 2005; Porter, 2006).

Statement of Problem

Discussions surrounding adoption of the Common Core State Standards (CCSS) emphasizes the ability for students to create both print and non-print text through integration of traditional and new literacy practices (Dalton, 2012; Dalton, Robinson, Lovvorn, Smith, Alvey, Mo & ... Proctor, 2015). However, under the common core, writing instruction is more strategic and substantive. The standards prioritize the argumentative writing and information/explanatory writing in order to prepare students for college and careers, and de-emphasize narrative writing, particularly personal narratives (Will, 2016). The high-stakes assessments force teachers to focus giving writing prompts that don't really give students the time to explore the beauty of writing because they're trying to link it so tightly to cite evidence from the text (Will, 2016). Will (2016) says "As teachers adjust to the writing-instruction expectations under the common standards, finding the appropriate balance of the different types of writing in the classroom can be a challenge—and it is creating considerable tension among educators."

As digital storytelling is suggested to be an important pedagogical approach to effective learning (Liu et al., 2014), there is an opportunity to give voice to students while they can still enhance new literacy skills that is underscored in the common core for this ever changing technological environment. The practice has been hailed for its potential to motivate teachers to attempt innovative literacy instruction, also stimulate students to write while improving skills needed for media literacy, thinking critically, and composing expository pieces (Shelby-Caffey et al. 2014). Students use and enhance their reading comprehension and writing skills during the creation of a story. Therefore, we should continue to press students toward high levels of

achievement and seek out opportunities to actively engage students in tasks that expand their repertoire of new literacy practices and cultivate their capacities for creating and producing while combining the old with the new (Shelby-Caffey et al., 2014). This message is on the page of common core standards.

Purpose of the Study

The purpose of this study was to investigate the impact of the levels of instructional approach: Labov's story grammar only, Lambert's seven elements only, and both Labov's story grammar and Lambert's seven elements, as scaffolding(s) on students' digital storytelling in second-grade classrooms. Particularly the researcher gauged whether the instructional approach with scaffoldings effectively improved students' performances in these aspects: written story content; spoken story structure; the coherency of visual and verbal expressions (representations) in their digital stories; as well as narrative knowledge, as compared to the instructional approach with no scaffolding by the end of the study. Students' written story content were assessed in the aspects of focus/setting; organization/plot; narrative technique; language conventions of grammar and usage; as well as language conventions of capitalization, punctuation and spelling. Student's spoken story structure were classified and analyzed from the perspectives of story episode, high point and dependency. Students' performances in verbal and visual expressions were compared in the aspects of vocal narration, music/sound, image and pace. Students' narrative knowledge were assessed based on narrative structure and narrative writing.

Research Questions

In order to examine the effect of the levels of instructional approach on students' performances in these aspects: story writing, storytelling, the integration of verbal and visual representation, as well as narrative knowledge; the researcher sought answers for the following four research questions:

- 1). How providing the instructional scaffoldings influence the content of stories wrote by second grade students?
- 2). How providing the instructional scaffoldings influence the structure of the digital stories told by second grade students?
- 3). How providing the instructional scaffoldings influence the coherence of visuals and verbal representations in the digital story produced by second grade students?
- 4). Do instructional scaffoldings improve students' narrative knowledge by the end of the study?

Significance of the Study

This study was expected to maximize the potentials of digital storytelling as new literacy practices for primary grade students in the classroom as an effort to promote their interests of and their actual abilities to digitally express themselves through spoken narrative discourse. The benefits of digital storytelling in the classrooms are enormous. For example, digital storytelling helps to build conceptual skills like understanding a narrative and using inductive reasoning to solve problems (Huang et al., 2012). It allows to use multimedia tools in a sophisticated fashion while capturing the joy of creating and sharing their stories (Czarnecki, 2009; Porter, 2006); the process of creating digital stories promote students' artistic expression and creativity (Yuan & Bakian-Aaker, 2015), enhance reading, writing, language and 21st century skills (Shelby-Caffey et al., 2014) ; facilitate active participation, learning, social skills (Gachago, Condry, Ivala & Chigona, 2014), communication skills (Gregory, Steelman & Caverly, 2009), critical thinking (Huang, Hwang &Huang, 2012; Liu et al., 2014) and personality development(Bratitsis & Ziannas, 2015). Through performing students' own personal digital stories, there is a potential to foster openings for youth's creative authoring practices and new literate identities. Therefore, this study is expected to delve into the question: in what ways we as educators can nurture these

young children to be good digital storytellers who can skillfully convey their new literacy skills to authentically share their personal stories.

For educators, this study was expected to provide a practical guideline for teachers in implementing digital storytelling in their new literacy practices. Because Ohler (2009) said “If we are going to fully engage students and prepare them to be literate, active participants in our technological driven world, then it is also imperative that we delve into the technological mediated narratives that students are creating and works in ways that develop them as tools for learning” (as cited in Shelby-Caffey et al., 2014). New literacies educators are responsible to tap into their ways of knowing and using media; they must perform as design consultants, resources managers, co-learners, and facilitators to guide students in blending traditional and new literacies in the classrooms. Through using instructional scaffoldings in students’ digital story creation process, the findings will provide insight for teachers regarding which instructional strategies is appropriate in guiding their students to craft a meaningful digital story in this new experience. In addition, the findings will provide specific suggestions for teachers who are struggling in designing instructional strategies in order to align with Common Core writing and language objectives (Gram, Harris & Santangelo, 2015).

Limitations of the Study

The results of this study must be interpreted within the limitations and delimitations of the inquiry. This research was based on data collected from one elementary school in one state within the United States. The sample size was relatively small; and the participants largely came from high socio-economic status families. Consequently, the result of current research might not be the representative for the population in other areas.

Definitions

Digital storytelling: digital storytelling extends the manner in which people tell stories

by allowing them to utilize digital multimedia, such as audio narration, video, images, podcasts, and music to communicate narratives in ways that are creative and compelling (Robin, 2006).

New literacy: it includes the skills, strategies, and insights necessary to successfully exploit the rapidly changing information and communication technologies that continuously emerge in our world (Leu, Forzani, Rhoads, Maykel, Kennedy & Timbell, 2015).

Chapter 2: REVIEW OF RELATED LITERATURE

Introduction

In the United States, the origin of educational technology or instructional technology field was often traced back as least as far as the first decade of the 20th century (Reiser & Ely, 1997; Saettler, 1990; Reisser, 2001). From then on, teachers began to show great interests in using visual media (films, slides and photographs) in the school, this was referred to as the “visual instruction” or “visual education” movement (Reiser, 2001). Then, People extensively used various kinds of visual or audio-visual media, such as films, slides, radio broadcasting, sound recordings, sound motion pictures etc., for instructional purposes during 1920s to 1930s (Reiser, 2001). During the 1950s after the World War II, people became interested in using instructional televisions as a medium for delivering instruction (Reiser, 2001). With the advent of computers and other digital technology as well as the Internet, it was believed that technology brings about tremendous changes in instructional practices. In the new era, the influx of technology in students’ lives has produced an entirely different type of student, shaping the way they think, learn, and experience the world around them.

When connecting technology to language arts instruction, particularly narrative writing instruction, the primary school teachers are inspired by the integration of traditional and new literacy practices throughout the process of creating a digital story, a combination of written and spoken words, photographs, illustrations, video clips, and sound to sharing stories or disclosing information (Sarica & Usluel, 2016; Yuan & Bakian, 2015). Digital storytelling is different from the traditional spoken or written story because its creation process is more interesting that consist of seven elements: 1. Point of view; 2. A dramatic question; 3. Emotional content; 4. The gift of your voice; 5. The power of soundtrack; 6. Economy; 7. Pacing (Robin, 2008, p.223). Students use and enhance their reading and writing skills during the creation of a story that

ultimately plays out as a digital movie (Sarica & Usluel, 2016; Shelby-Caffey, Úbédá & Jenkins, 2014). Digital storytelling could transform students' perceptions of and their actual abilities to express themselves through the written word (Tackvic, 2012). Digital storytelling has emerged as an innovative practice that allows students deeper engagement with content while encouraging the use of critical thinking and technological skills needed to navigate the ever changing digital terrain of the 21st century (Shelby-Caffey et al., 2014).

In order to appreciate and understand the complexity of this topic, various aspects must be examined. These aspects include research on the following: students' new literacy skills in the 21st century, multimedia learning theory, constructivist learning, digital storytelling and written and oral narrative discourse analysis. In addition, the current popular common core state standards that addressed the new literacies were discussed in the following section.

Students' New literacy skills in the 21st Century

The International Reading Association (2009) stated that “to become fully literate in today's world, students must become proficient in the new literacies of 21st-century technologies” (Drew, 2012). The new literacies involve the skills, strategies, and insights necessary to successfully exploit the rapidly changing information and communication technologies that continuously emerge in our world (Leu, Forzani, Rhoads, Maykel, Kennedy & Timbell, 2015). Kist (2013) identified five characteristics inherent in new literacy classroom: 1). daily work in multiple forms of representations; 2). teacher talk about various symbol systems; 3). teacher think-aloud when working in these different forms; 4). a mix of individual and collaborative activities; 5). a high level of engagement (p.17). In the 21st century, our children exist in a world of multiple signs, with more engaging symbol systems available than ever before.

Table 1

ISTE Standards for Students (2007)

Category	Description
Creativity and innovation	Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology.
Communication and collaboration	Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.
Research and information fluency	Students apply digital tools to gather, evaluate, and use information.
Critical thinking, problem solving and decision making	Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.
Digital citizenship	Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.
Technology operation and concepts	Students demonstrate a sound understanding of technology concepts, systems, and operations.

Note. This table was adapted from Standards•S © 2007 International Society for Technology in Education.

Recently, the International Society for Technology in Education (ISTE) standards for students and Common Core State Standards both address the idea of new literacy skills in today's classroom. The ISTE standards for students include six aspects: 1. creativity and innovation; 2. communication and collaboration; 3. research and information fluency; 4. critical thinking, problem solving and decision making; 5. digital citizenship; 6. technology operation

and concepts (Table 1). The Common Core State Standards in English Language Arts and literacy promised an opportunity to provide our students a technology rich learning and teaching environment since it covered the topic of “new literacy” and it changes the nature of literacy into online or digital literacy (Drew, 2013) (Table 1).

Table 2

ELA College and Career Readiness Anchor Standards That Address New Literacy

Content	Standard
Reading	CCRA. R. 7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.
Writing	CCRA. W. 6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others. CCRA. W. 8. Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.
Speaking and Listening	CCRA. SL. 2. Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally. CCRA. SL. 5. Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

Note. This table was adapted from “Open up the ceiling on the common core state standards, preparing students for 21st century literacy now” by S. V. Drew, 2013, *Journal of Adolescent & Adult Literacy*, 56(4), p. 323. ©2012 International Reading Association.

The ISTE standards and the Common Core standards for ELA and reading both recognize that education as it has always been done is not enough in the digital age (see Table 1 and Table 2). They both weigh the importance of technology use, not for technology’s sake, but as a tool for leap-frogging over lower-order thinking skills, such as rote memorization, to focus our energies

on research and media literacy, creativity, collaboration, problem solving, and critical thinking (ISTE, 2007). Technology gives us a larger space to express our knowledge with peers and experts across the globe; people will take fully advantage of a wide range of media and disseminate our ideas to far-flung, authentic audiences.

The Philosophy of Common Core State Standard

The common core state standards, released in 2010 by the National Governors Association and the Council of Chief State School Officers (NGA/CCSSO), promise an opportunity to expect our students to be “college-and career ready” in reading and mathematics when graduate from high school (Drew, 2012; Mathis, 210). With stunning rapidity, 47 states and the District of Columbia have signed on to replace their state content standards with the recently developed Common Core State Standards (Mathis, 2010; Conley, 2011). Even more remarkably, 45 states have joined the two assessment consortia (Partnership for Assessment of Readiness for College and Career and SMARTER Balanced Assessment Consortium) working to replace their existing tests with new assessments aligned with the standards (Conley, 2011). Many educators from the states which adopted this standard thought that it was more rigorous than their previous standards in English Language Arts (ELA). The Center on Education Policy (NEP) reported that the vast majority of the CCSS-adopting states acknowledged that implementing the standards would require substantial changes in curriculum and instruction (Kober & Rentner, 2011). A vast majority of states thought that implementation of CCSS in curriculum and instruction would lead to improve skills in these subjects (Kober & Rentner, 2011). States have been highly motivated to adopt the standards for two reasons: (1). The Obama Administration’s Race to the Top funds required states’ participation in the implementation of CCSS (Kober & Rentner, 2011); (2). Individual CCSS-adopting state modified the standard by adding up to 15% of new content (McLanghlin & Overturf, 2012).

Implementation of common core state standard in writing

The power of writing is particularly remarkable in CCSS (National Governors Association and Council of Chief School Officers, 2010) for the English language arts (ELA) in the United States (Table 3). Students are expected to learn to craft text that skillfully narrates imagined or real experiences as well as to use writing as a tool to facilitate reading and language learning and construct new knowledge (Olinghouse, Graham & Gillespie, 2015).

Table 3

Common Core Standards That Related to This Study.

Content	Standards
Writing	CCSW. 3 Write narrative in which they recount a well-elaborate event or short sequence of events, include details to describe actions, thoughts, and feelings, use temporal words to signal event order, and provide a sense of closure. CCSW.5 With guidance and support from adults and peers, focus on a topic and strengthen writing as needed by revising and editing.
Speaking and listening	CCSSL.4 Tell a story or recount an experience with appropriate facts and relevant, descriptive details, speaking audibly in coherent sentence. CCSSL. 5 Creating audio recordings of stories or poems; add drawings or other visual displays to stories or recount of experiences when appropriate to clarify ideas, thoughts, and feelings.
Language	CCSL 1. Demonstrating command of the conventions of standard English grammar and usage when writing or speaking.

Note. This table was adapted from National Governors Association Center for Best Practices, Council of Chief State School Officers (2010).

The Common Core State Standards generally focus on two areas: English language arts (ELA) and mathematics. The CCSS for ELA standards consist of reading, writing, listening and

speaking, and language. The Common Core State Standard identify 10 anchor standards each in reading and writing as a framework to build skills and understanding by the end of each grade (National Governors Association Center for Best Practices, Council of Chief State School Officers, 2010). One characteristic of CCSS is that the emphasis on integrating reading and writing is likely to support curricular coherence, and this is very important predictor of student achievement (Graham & Harris, 2015).

The CCSS requires writing as a developmental process through an emphasis on both the process of creating a text and the finished product (Parris & Headley, 2015). The writing standards are categorized as four aspects: text type and purposes; production and distribution of writing; research to build and present knowledge; and range of writing (National Governors Association Center for Best Practices, Council of Chief State School Officers, 2010). CCSS points out the important elements of narrative writing: focus or setting; organization; creative narrative; and diversity language (EGUSD Curriculum and Professional Learning Department, 2012). The variety in writing tasks, purposes, and audiences found in the CCSS is a welcome acknowledgement of the importance of authentic and relevant writing tasks and contexts to students' development and growth as writers (Parris & Headley, 2015).

Hayes and Olinghouse (2015) compared the Common Core State Standards in Writing to the Hayes' cognitive model of writing that embraces the control level, process level, and resource level, adapted to describe the performance of young and developing writers. They proposed the inclusions of standards for motivation, goal setting, writing strategies, and attention by writers to the texts. Hayes' cognitive model of writing provides an overview of writing process for young writers, whereas the Common Core State Standard in Writing provides an explicit assessment model for teachers and students in daily practice. For example, the CCSS for narrative writing mentioned, "orient the reader by establishing a situation and introducing a

narrator and/or characters; organize an event sequence that unfolds naturally” (National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010, p. 20).

Wilcox, Jeffrey and Gardner-Bixler (2015) conducted a multiple case study investigating how the Common Core State Standards (CCSS) for writing and teacher evaluation system based in part on CCSS assessment might be influencing writing instruction in elementary schools. The research site included nine schools (six achieved above-predicted performance on English Language Arts, and three demographically similar schools achieved predicted outcomes on the same assessments. Data were collected from interview and focus group transcripts, classroom observations, and documentary data. The findings from this study revealed that teachers from the majority of these nine schools were using evidence-based practices such as peer collaboration, prewriting/planning/drafting, using rubrics, and writing to learn.

Challenges of Common Core Standards in Writing, Reading, and Language

A review of Porter, McMaken, Hwang and Yang’s (2011) article in *Educational Researcher* examined the level of alignment between CCSS and state standards and state assessments. The lack of alignment between the state standards’ emphasis on expository writing and the CCSS emphasizes on argumentative writing resulted in one of many areas that would require fundamental changes in instruction and curriculum over the next few years (Kober & Rentner, 2011). Kober and Rentner (2011)’s findings revealed the lack of curriculum focus for CCSS that some state content standards for grade 3 to 6 were much more focused than is the CCSS. As such, teachers were continually challenged since the Common Core are too board and too superficial coverage of many topics (Porter, Smithson, Blank & Zeidner, 2007) to lead a specific direction about how to teach students to meet them (MaLanghlin & Overturf, 2012). As some research indicated, CCSS for ELA put greater emphasis on language study and less

emphasis on comprehension; CCSS expects a high level of cognitive demand from our students in order to compete with peers on a global scale (Kober & Rentner, 2011). Although Wilcox et al., (2015)'s study indicating that elementary school teachers shared a generally positive view of the CCSS for writing, typically performing school teachers expressed a more negative view regarding the paucity of emphasis on creative writing in the CCSS. Many teachers need to make significant changes in how writing is taught, in order to meeting the writing objectives in CCSS; however, CCSS fails to provide guidance on how teachers are to meet these writing benchmarks (Gram, Harris & Santangelo, 2015).

Because the standards are multifaceted, the elementary teachers who have been implementing the ELA standards realize that their thought processes about curriculum, instruction, and assessment are being continually challenged (McLanghlin & Overturf, 2012). Previous research revealed that the Common Core State Standards made a considerable shift from the previous state standard but lacked of specific (Porter et al., 2011; Gram et al., 2015). However, the CCSS put greater emphasis on “text complexity” which contained more specific language than previous standards (Beach, 2011; Brwon & Kappes, 2012.; Drew, 2013; Hiebert & Mesmer, 2013; Pearson, 2013; Porter et al., 2011). The College and Career Readiness Anchor Standards for reading were bookended by a specific focus on “close reading” of “complex text” (CCSS, 2010, p.10):

CCRA. R.1. read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

CCRA. R.10. read and comprehend complex literary and informational texts independently and proficiently.

These “close read” expectations brought about some challenges because k-12 schools

failed to pay enough attention to the development of students' reading comprehension as they progressed through increasingly complex text (Brown & Kappes, 2012). Teachers were continually challenged because their instructional strategies have to be aligned with the text complexity commitment (Pearson, 2013). Within each category in the CCSS, a general understanding of each specific expectation made it clear that writing teacher were not only following the Writing Standards, but also the reading, speaking and listening, and language because such specific topic vocabulary which teachers would traditionally expect to encounter in the Writing Standards were included in the Language Standards (McLaughlin & Overturf, 2012). The close reading of complex text maximized the amount of time that students spent on reading (Pearson, 2013), and fostered independence and analytic skills (Brown & Kappes, 2012). Students were challenged to reach a higher level of reading analytical skill and synthesizing skill rather than just comprehension before entering the college and workplace based on the "text complexity" of CCSS. The need for greater focus on reading and writing of "complex" informational texts remains questioned.

Drew's (2013) report revealed that the CCSS of "text complexity" failed to address the situation when students read online. The CCSS accompanying two assessments: PARCC and SMARTER Balanced assessment materials embracing "close reading" of digital text did not take into account the discursive, nonlinear, multimodal elements of online text (Drew, 2013). The CCSS failed to address the topic about how to teach our students for 21st century literacy demand, that is, the online literacy proficiency --locating, analyzing, synthesizing, and evaluating online information.

The Role of Scaffoldings in Literacy Instruction

The term "scaffolding" first appeared in the literature in Wood, Bruner and Ross's research paper "the role of tutoring in problem-solving" in 1976. They addressed "the

intervention of a tutor may involve a kind of "scaffolding" process that enables a child or novice to solve a problem, carry out a task or achieve a goal which would be beyond his unassisted efforts. This scaffolding consists essentially of the adult "controlling" those elements of the task that are initially beyond the learner's capacity, thus permitting him to concentrate upon and complete only those elements that are within his range of competence (Wood, Bruner & Ross, 1976, p.90). Therefore, the concept of scaffolding is very similar to Vygotsky's notion of the zone of proximal development, which also emphasizes that providing the appropriate assistance will give the student enough of a "boost" to achieve the task. (McLeod, 2012). Scaffolding involves helpful, structured interaction between an adult and a child with the aim of helping the child achieve a specific goal (Wood et al., 1976). In this study, the two instructional scaffoldings: William Labov's story grammar (1972) and Joe Lambert's seven elements of digital storytelling were used.

Although the two scaffoldings share the same goal with respect to creating a good digital story, the distinction of them are quite apparent. For example, generally the Labov's story grammar (1972) emphasize on the sophistication of story structure. Specifically, he focused on two functions of narratives: reference and evaluation. The first function aims to share information (where, who, when, how and what) of the narrator's personal experiences with the listener. The narrator will need to elaborate the experience in order to engage the listener into the narrator's story. The second function aims to tell the listener something about what the experiences meant to the narrator or something about the narrator him- or herself. In other word, this function is about why the story is told. The story grammar give us the verbal expression. On the other hand, Lambert's seven elements (2007) focused the integration of verbal, audio and visual elements when telling a story. Beyond text communication, the narrator incorporates technology in artful ways demonstrating craftsmanship in communicating with

images, sound, voice, color, white space, animations, design, transitions, and special effects. Students will promote new literacy skills while taking advantages of the seven elements in the digital storytelling process. Therefore, the details about the two instructional scaffoldings are provided in the following two sub-sections.

Story Grammars

Story grammars are used to be considered as a reasoning engine to improve students' reading comprehension and story reading performance (Liu et al., 2011; Liu et al., 2014). Numerous empirical research on reading and writing narrative provided possible story development hint based on story grammar at a meta-level (Johnstone, 2008; Labov, 1972; Liu et al., 2014; Liu et al., 2011; Pearson & de Villiers, 2005; Stein and Glenn, 1979). The studies regarding story grammars demonstrated three research directions. The first direction indicated that story grammar has been framed as models of plot structure in the narrative development in the past three decades (Pearson & de Villiers, 2005). For example, William Labov (1972)'s influential work on narrative of personal experience demonstrated a "fully developed" narrative included clauses or sets of clauses with the following functions in the order: 1. Abstract; 2. Orientation or setting; 3. Complicating action; 4. Evaluation; 5. Results or resolution; 6. Coda (Johnstone, 2008). Johnstone (2008) explicitly explained each element in Labov's story schema. An abstract consists of one or two clauses of describing or summarizing the story you will tell at the beginning of the narrative. An orientation or setting in a narrative introduces characters, temporal, and background environment. A complication action consists of one or series of event sequences leading up to their climax, the point of maximum sequence. An evaluation states or emphasizes what is interesting or important of the story to their audiences, why the audiences should keep listening and allow the teller to keep talking. A result or resolution release the tension and end the story. A coda consists of a short passage that announces the story is over or

connecting the meaning of the story to the present (Pearson & deVilliers, 2005). Stein and Glenn (1979)'s story grammar is similar to Labov's (Pearson & de Villiers, 2005) except they more focus on the logic sequence of episodes in the story. Their story grammar consists of two major components: the setting and the episode. The setting refers to the introduction of characters and description of social, temporal or physical context in the story. The episodes include events that influence the characters, the character's internal response (goal, cognition, and plan) to these events, the character's external response to his goal, and consequence or reaction (Stein & Glenn, 1979).

The second direction emphasized on the story grammar as instructional strategies in reading comprehension. Many researchers indicate that story grammar as one of reading instructional strategies increased the reading comprehension ability of elementary school students (Alves, Kennedy, Brown & Solis, 2015; Mahdavi & Tensfeldt, 2013; Wade, Boon & Spencer, 2010). It is noted that a story grammar, which is an attempt to construct a set of rules that can generate a structure for any story, provide an overall structure for teaching narrative text structure awareness (Dymock, 2007; Liu, Chen, Shih, Huang & Liu, 2011). Students are given a more elaborated understanding of stories with narrative strategy instruction (Dymock, 2007).

Based on the findings of past empirical research on story grammar, the third direction target on investigating strategies to improve students' story creation. Since story grammar were also applied as a tool to enhance student awareness of the story structure (Dymock, 2007), Liu, Chen, Shih, Huang and Liu (2011) incorporated an enhanced concept mapping with story grammar in a study of 114 third graders in order to improve their storytelling ability. Their study suggested that the students who used the concept map with story grammars could develop stories with structures that are more complex, clearer subjects, creative ideas, and abundant contents than those only using the concept map without the grammars. Based on this

assumption, Liu et al. (2014)'s current study on the effect of story grammar on creative self-efficacy and digital storytelling reveals that the use of story grammar as rule-based scaffoldings improve students story reading performance, enhance their comprehension of the stories, promote sophisticated stories development, and therefore produced better storytelling products.

Seven Elements of Digital Stories

Joe Lambert is one of the field's most noted pioneers. He and his colleague Dana Atchley helped create the digital storytelling movement in the late 1980s as cofounders of the Center for Digital Storytelling ("Story Center" now), a nonprofit, community arts organization in Berkeley, California. Since the early 1990s, the Story Center has provided training and assistance to people interested in creating and sharing their personal narratives (Center for Digital Storytelling, 2005). The Story Center is also known for developing and disseminating the Seven Elements of Digital Storytelling, which are often cited as a useful starting point to begin working with digital stories (Robin, 2008). During the first few years of workshops in Story Center, Lambert and his colleagues keep discussing with participants what made a story a digital story, and what made a digital story a good digital story. They came up with seven elements that outlined the fundamentals of digital storytelling and discovered that formally presenting them at the beginning of workshops greatly improved the process and the stories told. Nowadays, the dissemination of seven elements has expanded to elementary classrooms (Bull and Kajder, 2004; Shelby-Caffey, Ubeda & Jenkins, 2014).

Lambert categorized seven characteristics of good digital stories:

1. Point of view: using the first-person pronoun "I" rather than the more distant third-person point of view is essential.
2. Dramatic question: an attention-getter that works to pique audiences' interests.
3. Emotional content: a storyline that draws the viewer in and stirs an emotional

connection.

4. Economy: carefully crafting a script that sharpen the focus of story and deciding what is essential to the story.

5. Pacing: managing a rhythm that keeps the audience's attention and interest

6. The gift of voice: using your voice to tell your story.

7. Soundtrack: properly incorporate music in your story to add complexity and depth to the narrative.

Lambert's seven elements were influenced by the concept "story circle which is about stories move in circles and they don't move in straight lines. Therefore, he refines his ideas about seven elements of digital storytelling in his book *Digital Storytelling Cookbook* (2010). He states:

It helps each storyteller not only find and clarify the story being told, but also check in with them about how they feel about it, identify the moment of change in their story, then use that to help them think through how the audience will see and hear their story in the form of a digital story. Finally, after the Story Circle is completed, and the storyteller has had some time alone with his or her thoughts, they can then let all of these considerations inform them as they sit down to write. (p.9)

In his book, Lambert rewrites another version of his seven elements called "seven steps of digital storytelling".

1. Step one—owning your insights

It is important to help storyteller find and clarify what their stories are about, storytellers need to ask themselves such as "what's the story you want to tell? With follow up question, "what do you think your story means?" "Through storytelling, it is actually the teller, rather than the listener, who seeks to learn from the story told" (Lambert, 2010, p.10).

2. Step two—owning your emotions

Storyteller's awareness of the emotional resonance of their story is crucial. Lambert (2010) underscores that storytellers need to identify their emotions in their story with asking themselves “what emotions did you experience as you share your story?” or “which emotions will best help the audience understand the journey contained within your story?” He recommended storytellers convey their emotions without directly using “feeling” word or relying on cliché to describe them.

3. Step three—finding the moment

To identify the moment of change in the story is critical but also challenging for storytellers. Lambert (2010) provides a series of questions to ask them “what was the moment when things changed? Were you aware of it at the time? If not, what was the moment you became aware that things had changed? Is there more than one possible moment to choose? If so, do you convey different meanings? Which most accurately conveys the meaning in your story? Can you describe the moment in detail?”

4. Step four—seeing your story

Digital storytelling is about creating a visual narrative. In order to “see” their story, storytellers need to describe the image that come to mind, understand what those images convey, find or create those images, and then determine how best to use them to convey their intended meaning.

5. Step five—hearing your story

When the emotional tone of the story has been identified, the sound is one of the best ways to convey the tone, through the way that the voice-over is performed, the words that are spoken, and the ambient sound and music that work with narrative.

6. Step six—assembling your story

This step requires you to be ready to assemble your story by spreading out your notes and images and composing your script and story, you will ask yourself two questions “1. How are you structuring the story? 2. Within the structure, how are the layers of visual and audio narratives working together?”

7. Step seven—sharing your story

The last step requires you to present your digital story in front of your audience. Storyteller needs to consider “who is your audience? What was your purpose in creating the story? In what presentation will your digital story be viewed?”

In fact, Lambert’s seven elements are well-known among literacy researchers and practitioners than his seven steps in most current academic articles on K-12 education (Bull & Kajder, 2004; Kieler, 2010; Robin, 2008; Shelby-Caffey, Ubeda & Jenkins, 2014). Perhaps because his seven steps require storytellers to have higher level of comprehension of its meaning in each step, while primary grade students need more concise and simple wording to guide their creation of digital story. One elementary school teacher in her “reflection on trails in using digital storytelling effectively with the gifted”(2010) underscores “I went back and looked at ‘Seven Elements of Digital Storytelling’ and began to understand what I had left out of the instructions to my students. I began to understand that all of the elements are critical to the success of the story, and I had not given them the attention that was needed.”(p.51). Other articles focusing on digital story construction also reflect the importance of seven elements in guiding students’ digital story development (Bull & Kajder, 2004; Robin, 2008; Shelby-Caffey, Ubeda & Jenkins, 2014). Previous studies provide an insight into exploration of the function of rule-based scaffoldings, such as seven elements and story grammars in elementary school students’ digital literacy experiences. Therefore, there is a good reason to believe that the seven elements of digital storytelling combined with the story grammars have its potential to scaffold

students' digital story creation process with an aim to fostering them to be a good digital storyteller.

Digital Storytelling for Effective Learning

Cognitive Theory of Multimedia Learning.

The basic theory of digital storytelling for effective learning was based on the cognitive theory of multimedia learning (Mayer, 2009). Cognitive theory of multimedia learning is one of the cognitivist learning theories introduced by an American psychology professor Richard Mayer in the 1990s. His theory draws on Paivio's (1991) dual coding theory (Clark & Paivio, 1991), Sweller's (1994) cognitive load theory, Baddeley's (1992) model of working memory. Baddeley's (1992) working memory model explains what happens to information after it is perceived by the sense organs and suggests that there are separate slave systems such as phonological loop and visuo-spatial sketch pad for processing visual and verbal information (Baddeley, 1992). Paivio's (1986) dual coding theory proposed attempts to give equal weight to verbal and non-verbal processing (Paivio & Lambert, 1981). Sweller's cognitive load theory is concerned with the way cognitive resources are focused and used during learning and problem solving (Sweller, 1994).

Theories proposed by Mayer's multimedia learning concerning a cognitive theory of how people construct knowledge from words and pictures. The words can be spoken or written, and the pictures can be any form of graphical imagery including illustrations, photos, animation, or video. Mayer proposed "Learning is a change in knowledge attribute to experience: (a) learning is a change in the learner; (b) what is changed is the learner's knowledge; (c) the cause of the change is the learner's experience in a learning environment. The change may involve reorganizing and integrating knowledge rather than adding new knowledge" (p.59-60).

Basic assumptions of multimedia learning theory include two separate channels (visual

and auditory) for processing information. Learning can be more successful if both of these channels are used for information processing at the same time (Mayer, 2009). Mayer's theory (2009) is based on three assumptions:

1. Dual-channel assumption -The verbal and visual channels in our working memory are separated and can be used for processing information simultaneously thus enhancing process of learning.

2. Limited capacity assumption -As Miller's Information processing theory (1956) has shown, these channels have limited capacity and limited time they can hold information. Too much information can therefore cause cognitive overload. Active-processing assumption – Human engage in active learning by attending to relevant incoming information, organizing, selected information into coherent mental representations, and integrating mental representations with other knowledge. (Mayer, 2009, p.63)

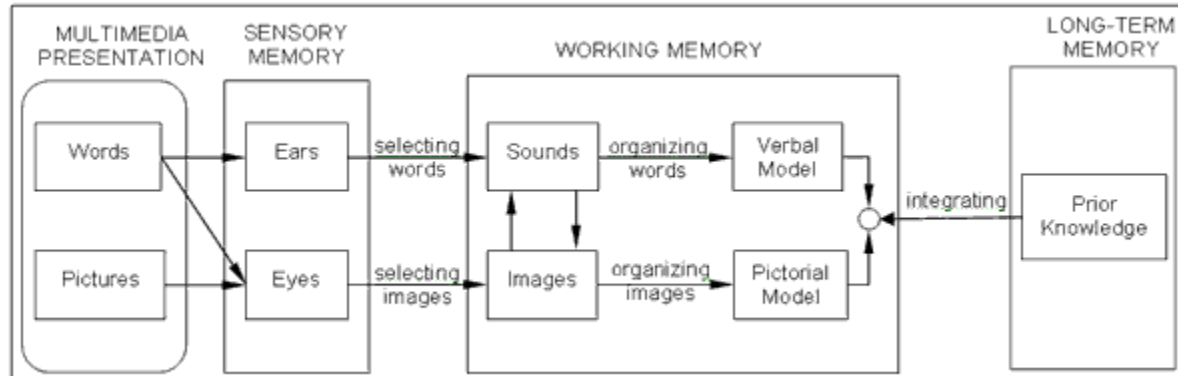


Figure 1. Cognitive theory of multimedia learning (Mayer, 2009, p.61).

Figure 1 shows a cognitive model of multimedia learning which represents the human information-processing system. Pictures and words come in from the outside world as a multimedia presentation (as shown on the left side of the figure) and enter sensory memory through the eyes and ears (as show in the sensory memory box). Sensory memory allows for pictures and printed text to be held as exact visual images for a very brief period in a visual

sensory memory (at the top) and for spoken words and other sounds to be held as exact auditory images for a very brief period in an auditory sensory memory (at the bottom). The central work of multimedia learning takes place in working memory. Working memory is used for temporarily holding and manipulating knowledge in active consciousness. For instance, in reading a sentence, you may be able to focus on some words at one time, or you may be able to hold only some images of the boxes and arrows in your mind at one time. The left side of working memory represents the raw material that comes into working memory—sound images of word and visual images of pictures, the two connect to verbal model and pictorial model respectively. The very right side of the boxes is the long-term memory and is linked to the learner's stored information (prior knowledge or experiences). Unlike working memory, the long-term memory can hold a large amount of information over a long period. But in order to actively think about material in long-term memory, it must be integrated into working memory (p.61-62).

Mayer (2009) demonstrated that multimedia learning as knowledge construction—“learner is an active sense maker who experiences a multimedia presentation and tries to integrate the presented material into a coherent mental representation; whereas the teacher's job is to assist the learner in this sense-making process” (p.17). Mayer and Moreno (2002) suggested, “Meaningful learning occurs when learners actively select relevant information, organize it into coherent representations, and integrate it with other knowledge” (p.111). Therefore, Mayer's cognitive theory mainly focuses on promoting constructivist learning in which the learner actively engages in cognitive process of sense making (Mayer & Moreno, 2002). However, the weakness of Mayer's cognitive theory is that his theory-based research discussed about promoting constructivist learning from passive media (computer based) since no behavioral activity nor social activity is required on the part of the learner. For example, in one

of his empirical research, he designed five types of multimedia message aids: multimedia, contiguity, coherence, modality, and redundancy, and compared the learning outcomes of students who received these types of aids with those who received no aids. His results indicated that students understand more deeply when they received words and pictures rather than words alone; when words and pictures are presented simultaneously rather than successively; when unneeded words and sounds are eliminated; when words are presented as narration rather than on-screen text; when words are presented solely as narration rather than as narration and on-screen text. Instead of discussing about passive media, this study will focus on digital storytelling as a participatory media to foster students' constructivist learning in which they actively participate in the creation process: design, organize, review, edit, and evaluate.

What is Digital Storytelling?

Discussions surrounding adoption of the Common Core State Standards (CCSS) emphasizes students' ability to create both print and non-print text through integration of traditional and new literacy practices (Dalton, 2012; Dalton, Robinson, Lovvorn, Smith, Alvey, Mo & ... Proctor, 2015). As digital storytelling is becoming an imperative pedagogical approach to effective learning, we must continue to press students toward high levels of achievement. In addition, we seek out opportunities to actively engage students in tasks that expand their repertoire of new literacy practices and cultivate their capacities for creating and producing. (Shelby-Caffey, Ubeda & Jenkins, 2014).

Although digital storytelling in the classroom is not a new idea, still many recent research about new literacy or media literacy development emphasize on integrating digital storytelling in the classrooms. As an innovative practice for deeply engaging students with curriculum content, digital storytelling demonstrated the use of critical thinking and Information and Communication Technological (ICT) skills needed to navigate the ever-changing digital

terrain of the 21st century. (Huang et al., 2012; Liu et al., 2014; Morgan, 2014; Parsons, Malloy, Parsons & Burrowbridge, 2015; Price-Dennis, Holmes & Smith, 2015; Sadik, 2008; Sarica & Usluel, 2016; Ware, 2006; Yang & Wu, 2012). Therefore, digital storytelling has become an imperative pedagogical approach to affective learning (Liu et al., 2014). There are many versions of definitions about digital storytelling. For example, the digital storytelling association (2011) defines:

Digital storytelling is the modern expression of the ancient art of storytelling.

Throughout history, storytelling has been used to share knowledge, wisdom, and values. Stories have taken many different forms. Stories have been adapted to each successive medium that has emerged, from the circle of the campfire to the silver screen, and now the computer screen.

Bernajean Porter in her book *Digitales: The Art of Telling Digital Stories* (2005) defines: Digital storytelling takes the art of oral storytelling and engages a palette of technical tools to weave personal tales using images, graphics, video, music and sounds mixed together in an author's own story voice. Digital storytelling is an emerging art form of personal, heartfelt expression that enables individuals and communities to reclaim their personal cultures while exploring their artistic creativity. While the heart and power of the digital story is shaping a personal digital story about self, family, ideas, or experiences, the technology tools also invite writers and artists to think and invent new types of communication outside the realm of traditional linear narratives.

Joe Lambert in his book *Digital Storytelling: Capturing Lives Creating Community* (2013) mentions “Digital storytelling, woven through semester, improved engagement, connection, creative and critical thinking, and communication”.

There are many different definitions of “Digital Storytelling”. However, generally speaking, they all revolve around the idea of combining the art of telling stories with a variety of

digital multimedia, such as images, audio, and video, in other words, all digital stories bring together some mixture of digital graphics, text, recorded audio narration, video and music to present information on a specific topic. As is the case with traditional storytelling, digital stories revolve around a chosen theme and often contain a particular viewpoint. The stories are typically just a few minutes long and have a variety of uses, including the telling of personal tales, the recounting of historical events, or as a means to inform or instruct on a particular topic (Robin, nd; Ohier, 2007).

A search of “digital storytelling” in the Academic Search Complete database located 174 academic articles published since 2006 (Appendix H). Of those research articles, 31 literatures discussed about digital storytelling as innovation instructional practices in elementary schools. Of these literatures, approximately 7 empirical literatures specifically focus on primary grade classrooms that shed light on this study (Foley, 2013; Lenters & Winters, 2013; Sarica & Usluel, 2016; Vasudevan, Schultz, Bateman, 2010; Ware, 2006; Wessel-Powell, Kargin and Wohlwend , 2016; Yuan & Bakian, 2015). In particular, digital storytelling emerged as an inclusive supportive literacy practices that create a community of learners. For example, Sarica and Usluel’s (2016) study on primary grade students examined the effect of digital storytelling on their visual memory capacity and writing skills. Their findings revealed the active role of second grade students throughout the digital storytelling project and the scenario writing were influential in the greater degree of development in the experiment group since they were engaged with writing and revising their scenarios during the story creation process. Foley’s (2012) study in two primary grade classrooms revealed the potential role of digital storytelling as participatory media for writing instruction which demonstrated students’ skills as writers, impact students’ perceptions as writers, build students’ identities as writers, engaged students in the writing process, and illustrate the differences in writing competences between first-and

second grade students. Generally, these relevant research papers believed digital storytelling fosters young children's creative authoring experiences, and ultimately will promote multiple literacy skills, increase their multimodal composing abilities.

Digital Storytelling Promotes Multiple Literacy Skills.

Robin (2007) emphasized, "Digital Storytelling by students provides a strong foundation in many different types of literacy, such as information literacy, visual literacy, technology literacy, and media literacy" (p.4). Flaherty and Glantz (2014), Dalton, Robinson, Lovvorn, Alvery, Mo, Uccem and Proctor (2015), Drew (2012) and Richardson (2012) all have labeled these multiple skills that are aligned with the Common Core State Standards which they describe as the combination of:

- 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.
- Robin (2008) summarizes that students increase a full complement of literacy skills when participating in a series of thinking, designing, creating and presenting their own digital stories:
 - 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.

Digital Storytelling Fosters Creative Authoring Experience

Yuan and Bakian-Aaker (2015) in the action research “focus on technology: classroom digital storytelling in grade k-2: writers make a movie for the reader” reveals the various benefits of digital storytelling projects in the classrooms. It includes teachers’ use of innovation literacy teaching methods to encourage students to read and write digitally, or increase students’ knowledge of technology concepts, and promote their creativity and artistic expression.

Vasudevan et al. (2010) engage the theoretical lens of multimodality in rethinking the practices and processes of composing in classrooms. Particularly, they emphasize on how learning new composing practices led young children to author new literate identities, in other word, authorial stances in their classroom community. Their analysis explored in depth analysis of multimodal text through an analysis of the interrelationships between multimodal composing process and the development of literate identities. They found that by extending the composing process beyond print modalities students’ composing shifted in significant ways to reflect the

circulating nature of literacies and texts and increased the modes of participation and engagement within the classroom curriculum.

Similar study on multimodal literacy also examine how a Singapore out-of-school digital storytelling workshop was shaped by ideological clashes between differing definitions of literacies and learning (Anderson & Wales, 2012). The researchers were inspired by the circulating ideologies of language learning as attempts to foster openings for youth's creative authoring practices.

Digital Storytelling as Multimodal Composing

In the area of multiple literacy, many current research deems digital storytelling as multimodal composing or multimodal literacy, which address the ways of incorporating a range of modalities including writing, oral, digital (visual design); the process and product of digital storytelling involves all the modalities of literacy instruction, including listening, speaking, reading, writing, viewing, and representing (Wake, 2009).

Ware (2006) demonstrated two nine-year-old children who used different oral, written, visual, and digital modes as resources to create meaning and to position themselves socially through multimodal stories. This experience help researcher and teachers understand the social purpose and dynamics of storytelling in a technology-rich classroom.

Lenters and Winters (2013) explored the affordances of literature-based, art-infused and digital media processes for students, where multimodal practices take center stage in an English Language Arts unit on fractured fairy tales. They invited five primary grade students to experience the multimodal expression in fractured fairy tales. This experience led students to the production of individual fractured fairy tales written with a level of sophistication their teacher had not previously seen in their writing.

Similar to Lenters and Winters' study (2013), Wessel-Powell et al. (2016) currently

conduct a study on enriching and assessing young children's multimodal storytelling. This study inquiries issues around popular media and digital literacies, help young children learn filmmaking techniques, and develop an age- appropriate media literacy curriculum for young children. First, the teachers used the folktales and fairy tales reading workshop unit they had taught the month before as a basis to begin talking with their students during writers' workshop time about how to bring strong characters to life. The use of multimodal checklist effectively mediated writing craft in this classroom through mini-lessons on character, setting, story shapes, storyboarding, and script writing. Next, children creating written texts around the genres of plays and film: scripts, story maps, settings, and characters. They created characters with art materials, introduced their characters to friends, and talked about possible shared stories by considering their characters' particular features. The storytelling teams worked collaboratively to create publicly shared texts that engaged audiences and friends through songs, voices, and movement. The findings suggest that more children could be recognized as successful literacy users if an expanded multimodal checklist were considered for assessment purposes.

Dalton et al. (2015) suggested that multimodal composing is part of the Common Core vision of the twenty-first-century students in their research. Their first study described elementary school students' digital retelling accuracy by assessing their multimodal designs in four aspects: visual, animation, sound, and writing point of view. Their second study involving retrospective design interviews revealed that students expressed design intentionality and a meta-modal awareness of how modes work together to create an appealing story.

Written Narrative and Spoken Narrative

Review of previous literature shows that digital storytelling usually consists of two major components: written narrative and spoken narrative (Xu et al., 2011). In essence, narrative writing is an important component of the process of digital stories creation (Lambert, 2013;

Robin, 2008; Sarica & Usluel, 2016; Xu, Park & Baek, 2011). A good storyteller needs a good story script; a good story script requires excellent writing skill. Several recent research suggested that digital storytelling has a significant impact on students writing process and ultimately increases their writing skill and reading comprehension (Morgan, 2014; Robin, 2008; Sarica & Usluel, 2016; Shelby-Caffey, Ubeda & Jenkins, 2014). Therefore, the following sections discuss about the students' story writing and storytelling in the process of digital storytelling.

Narrative Writing in the Process

Past research has proved that storytelling is an effective approach in elementary writing instruction. For example, Louise (1999) suggested that storytelling bridges students' established oracy skills and their newfound literacy skills, such as word recognition, spelling, grammar, literary conventions, and comprehension. Mello (2001)'s meta-analysis of eight studies about the use of storytelling as a pedagogy strategy revealed that students' literacy was improved in the academic areas of fluency, vocabulary acquisition, writing, and recall. In addition, Miller and Pennycuff (2008) mentioned that "when students retell stories, they have the opportunity to further develop their skills of comprehension by relating stories with expressions" (p.38).

Nowadays, with the proliferation of technology in contemporary lives, the increased exposure to technology has changed the way students respond to instruction and has led to a new need for teachers to integrate digital resources in the curriculum, though some teachers do not use enough digital resources for students to derive the full benefits of technology (Hani, 2014). For example, Shelby-Caffey et al. (2014) found out that the integration of traditional and new literacy practices is evident throughout the process of creating a digital story. Students use and enhance their reading and writing skills during the creation of a story that ultimately plays out as a digital movie. Digital storytelling could transform students' perceptions of and their actual

abilities to express themselves through the written word (Tackvic, 2012). Zoch, Langston-DeMott and Adams-Budde (2014) discovered that elementary students were actively engaged and learning at a digital writing camp. They were motivated and learned to use technology through experimentation and collaboration. The authors found that technology had a positive effect on the students' writing process and final products. Although they have limited access to technology at home and school, it was suggested that teachers should give them more access to and experience is digital composing.

Digital storytelling activities are sequenced to teach writing skills through the construction of various types of digital stories (Figg, 2005). Hayes and Flower (1981) think writing is one of the most complex cognitive activities and involve a great number of cognitive component. Carl Bereiter and Marlene Scardamalia (1987), who focused on the development of writing processes in school age children, proposed a knowledge telling model which contribute to young children's story writing. The model in Figure 2 explains the cognitive writing process that the child forms a mental representation of the assignment, determining the topic and drawing on discourse knowledge to identify the type of text to be written. When the child composes, the mental representation plays an important role to guide the search and retrieve relevant content and discourse knowledge from long-term memory. Specifically, when writing a story with the knowledge telling approach, young writers usually use their knowledge regarding what forms a story and good writing product (e.g. characteristics and various schemas). It along with pertinent prior knowledge (for example, "what the surface of moon looks like"), to define the writing topic ("I will write a story about the moon where I believe it looks like a desert, it is dry, rocky and sandy).

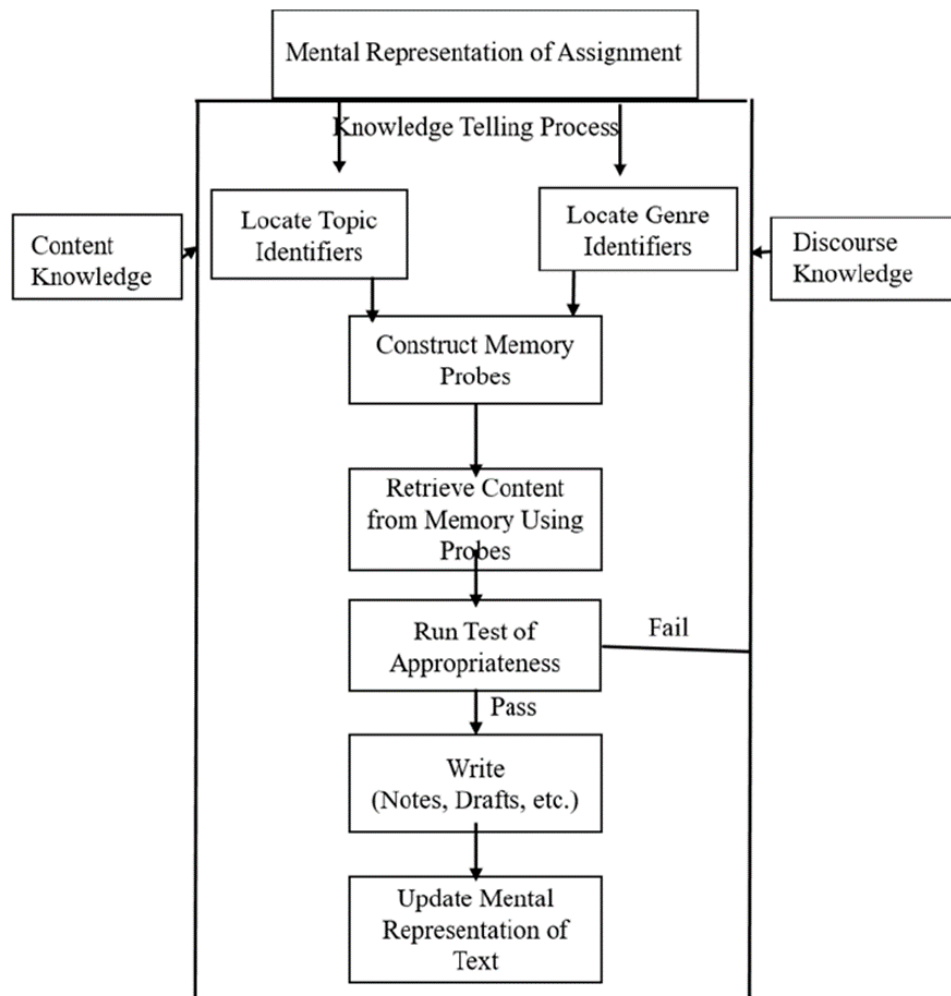


Figure 2. Bereiter and Scardamalia's (1987) knowledge telling model.

There are no plants on the Moon.”). The young writer uses this mental representation to search long-term memory for content and discourse knowledge (e.g. how should I start a story? --“In the year 1969”—a schema for carrying out a specific writing task, placing the story in a specific time.”). If the young writer thinks the retrieved content is appropriate given the topic and nature of the assignment, then it is transcribed into written text (“In the year 1969, human beings from planet Earth first stepped on the moon. They walked around a bit and collected some moon rocks to take back with them”). This serves as a stimulus, along with mental representation of the assignment and other text produced as the child progress through the story, to produce a next memory search. If the retrieved content is not appropriate for this story, then this also inspire

another search for additional information (“What is a more appropriate word to describe the moon? I can’t think of a good word to describe it but I will keep trying because that is what good writers do”) (Olinghouse & Graham, 2009).

On the other hand, Mayer’s cognitive theory of multimedia learning (2009) provide us inference that the incorporation of digital storytelling would stimulate students’ memory including auditory sensory memory, working memory, long-term memory, visual memory, and visual short-term memory. Based on this assumption, Sarica and Usluel (2016) conduct a study on the effect of digital storytelling on the visual memory capacity and writing skills of students. The study involves 59 second-grade students and the findings suggest a significant improvement in terms of the visual memory capacity and writing skills of students in both experimental and control groups, and the average gain scores in the “Benton Visual Retention Test” and “Composition (Written Narrative) Evaluation Scale” were higher in the experimental group.

Spoken Narratives

Writing a good script makes the digital story more interesting and effective. However, creating and telling a story that resonates is not easy. Students often spend more “digital” time searching for images and audio files rather than on the story (Robin, 2007, as cited in Xu, Park& Baek, 2011). A good storyteller needs a good story to tell.

A digital story likewise a traditional story has its structure. Much more attention has always been given to narrative in research and in early schooling (Peterson & McCabe, 1984). Over the past years, many linguistic researchers have different perspectives about narrative. Labov (Labov & Waletzky, 1967) and later Bruner (1986) argued that narratives are a fundamental way in which humans encode and make sense of their experiences. They brought attention of linguistics to naturally occurring narratives in people’s everyday lives and sought to apply the basic techniques of structural linguistic analysis to narrative function. For example,

some focused on the macro-structure of the event sequences in the form of “story grammar” (as cited in Peterson & McCabe, 1964). Models of plot structure or story grammar provided the frame for describing and analyzing children’s growth in coherence (Johnstone, 2004; Peterson & McCabe, 1984; van Dijk, 1981). In this sense, the appropriate way to judge a story is good or bad is to look at its structure (Peterson & McCabe, 1984). Therefore, McCabe and Peterson (1984) selected three different ways to analyze a story’s structure: 1) episodic or story grammar approaches as problem-solving episodes; 2) Labov’s high point structure; 3) Deese’s dependency analysis. They found that most outstanding stories produced by elementary school children were deemed sophisticated by two or three systems. They also found that people were sensitive to structure, not merely to content, when judging a narrative to be good. Moreover, they were sensitive to structures as all three discourse-analyses define it, which validates each system’s description of an ideal structure. Although some modest overlap between episodic and high point analyses in scoring a narrative structurally sophisticated, the three analyses were not redundant with each other in evaluating a good story. Therefore, in this study, students’ story structures will be evaluated according to these three discourse-analyses (Peterson, 2013).

Story episodic analysis. The notion of episode occurs not only in a theory of discourse, but also in everyday discourse (Pearson & de Villiers, 2015). We speak about an “episode” of our life, an “episode” during a party, an “episode” in the history of a country, or about episodes in stories about such episodes (van Dijk, 1981). Episodes may follow one another sequentially or may be embedded within other episodes (Johnstone, 1977; McCabe & Peterson, 1987; Stein & Glenn, 1979). Researchers have different perspectives in the details of their “story grammars”, but all of them “parse stories into informational nodes showing how a protagonist solves a problem; these nodes include such information as initiating events, goals, attempts to accomplish these goals, and consequences” (McCabe & Peterson, 1987, p. 458; Peterson, 2013).

William Labov was one of the researchers leading the study on oral narratives of personal experiences. He (1972) defined “a narrative is defined here as one way of recounting past events, in which the order of narrative clauses matches the order of events as they occurred” (p.2). His influential schema was one of the first to define the minimal characteristics of a well-formed story (van Dijk, 1981). His fully-formed oral narratives included: 1) Abstract—a brief statement of what the story is about. 2) Orientation or setting—“who, where, and when. 3) Complication actions—leads to a high point and then to the resolution or result. 4) Evaluation—the evaluative statement convey the narrator’s personal involvement in the story through expressing their own or the characters’ desires, intentions, thoughts, or opinions, in other words, it gives the motivation or commentary to the story. 5) Resolution—what happened in the end? 6) Coda—the narrator provides a short passage that indicates that the story is over and may bridge back to the conversation the story was embedded in. (Labov, 1972; Labov, 1997)

McCabe and Peterson (1987) designed a scoring procedure of episodic analysis to evaluate a student’s story structure. They classified 288 oral narratives of personal experiences produced by 96 children (age between 3.5 and 9.5) chosen from a nursery school and an elementary school into 8 categories: 1) Descriptive sequence— a simple description of the character and his or her surroundings and habitual actions. 2) Action sequence-- the focus is on behavior, with a series of causally unrelated actions as well as external and internal states of the characters involved. 3) Reactive sequence—the focus is on changes in the narrative environment. 4) Abbreviated episode—this describe a story consists of some crucial elements: goals, motivation, a sequence of events. 5) Complete episode—this describes a story includes at least three of the categories of event, motivating states, attempts, and consequence, with the consequence category obligatory. 6) Complex episode—this describes a story involves complications of the basic complete episode. 7) Interactive episode—this describes a story

involves two people who have goals and influence each other. 8) Multiple episode—this describes a story consists of more than one above structure. They suggested that the structure of a good story should involve complete, complex and interactive episodes.

High point analysis. Labov and his colleagues (Labov & Waletzky, 1967) suggested that a good story is constructed around “high points” or “suspension points”. They suggested that a good story builds up to a high point through the recapitulation of events and then often suspends the action at this crisis point while its importance is highlighted (McCabe & Peterson, 1987).

Therefore, McCabe and Peterson (1987) classified children’s oral narratives into 6 categories according to the high point analysis. These six categories include: 1) Disoriented—in these narratives, the child is either confused or disoriented about the events being narrated or misuse language such that the narrative cannot be understood. 2) Impoverished—the narratives consist of so few sentences or they provide two successive events and then go over and over them. 3) Chronological—these narratives contain a sequence of events but not built around high point. 4). Leapfrogging pattern—the narrator jumps from one event to another but clearly leaves out various major events. 5) Ending-at-the-high-point pattern—the narrator provides successive complicating actions until a high point is reached. 6) Classic pattern—the story leading up to a high point, or crisis, are recapitulated in a well-ordered series. They suggested that the classic narrative is the best narrative from the point of high-point analysis.

Dependency analysis. McCabe and Peterson (1983) explained that the episodic analysis and high point analysis were primarily with respect to the content of narratives, that is, what information they convey and the order of that information; whereas dependency analysis developed by James Deese would primarily examine with respect to their syntactic form. They pointed out “dependency analysis asks how coherent is any given discourse.....whether a given proposition is coordinate or subordinate to any other given proposition is the principal question

asked by dependency analysis” (p.458). Therefore, they classified narratives into 6 categories from the perspective of dependency analysis: 1) Simple coordinate sequence: in their narratives, propositions simply proliferate with few dependencies of one proposition upon another. 2) Simple subordinate sequence—no real proliferations at any level, a series of contrastive propositions are successively dependent upon each other. 3) Combination of a simple coordinate with a simple subordinate sequence. 4) Mixed coordinate sequence: a fair number of propositions consistently show moderate elaboration by means of dependent propositions. 5) Mixed subordinate sequence—a mixed coordinate sequence is combined with a spate of successively dependent propositions elaborating some aspect of discussion. 6) Ideal hierarchy—propositions display elaborate proliferation of dependencies. They also indicated that narrative structure exposed by dependency analyses might also be depicted as tree diagram, with the most dominant proposition represented by the vertex of the diagram (Peterson & McCabe, 1984; Peterson, 2013).

Spoken Versus Written Usage in Narrative Text Construction

How students tell a story orally and in writing manifest distinctiveness in their linguistic literacy and linguistic expression (Berman, 2016). Speaking of linguistic literacy, Berman (2016) summarizes that children’s linguistic literacy in the sense involves the ability to use language in different discursive contexts and for varied functions by appropriate deployment of three inter-related facets of language use: genre, register, and stance. For example, six to nine years old school children express themselves in very different ways when telling or writing a personal narrative as against when expressing their thoughts and ideas on a given topic. They favored past tense and (where relevant) perfective aspect in narratives and relied on personal pronouns and concrete, image-able names for people and objects in narrative.

Berman (2016) also summarizes that the distinctiveness of written and speech manifested

both procedurally and linguistically. Specifically, the effects of rapid online processing of verbal production in speech will result in longer, more extensive outputs and resources to use of “ancillary material” such as reiterations, false starts, hesitation markers. And other indicators of disfluency, and also discourse-marker qualifiers, such as intensifying terms very, really, madly, hedges like just, kinda, like; and segment-taggers such as and then, so, and that’s about it. Additional significant differences between students tell a story and in writing emerged in the domain of syntactic packaging or clauses-combining and lexical usage. Specifically, oral narratives packaged together on average significantly produce more clauses in a single syntactic unit of discourse than the writing counterpart, whereas written text made use of more polysyllabic words, greater reliance on nouns, verbs, and adjectives, and more use of less common vocabulary than oral counterparts.

Moreover, cognitively attitudes to the relation between the two media of expression—spoken and written represent distinct ways of looking at the world, two “modes of consciousness” as it were. So that “thinking of speaking” elicits not only different forms of linguistic expression but also reflects distinct thought processes than its counterpart “thinking for writing” (Slobin, 2005; as cited in Berman, 2016).

Interestingly, Ravid and Bertman (2006) conducted a study on comparing the information density in spoken versus written discourse by distinguishing between two broad classes of material in narrative texts: narrative information as conveyed through three types of propositional content—events, description, and interpretations, and ancillary information as conveyed by non-novel, non-referential, or non-narrative material. Study includes 2th, 5th, 11th grade students and adults. The finding suggested that significant increase in narrative information by the spoken modality other than the written, regardless of age. The function of modality has a distinct effect on information density in narrative production.

Review of Related Literature Summary

Research in the field of educational technology have been reported for over 90 years. Reviewing a wide variety of scholarly artifacts has provided an overview of the research foci in the aspects of new literacy skills in the 21st century classroom, cognitive theory of multimedia learning, meaningful digital storytelling activities in primary grade classrooms, and narrative writing and speaking in primary grade classrooms. These aspects of study formed an interrelated framework for this investigation of the potential of digital storytelling as participatory media for literacy instruction.

Chapter 3: RESEARCH METHODOLOGY

In order to examine the impact of the instructional scaffolding(s) on second grade students' written story content, spoken story structure, the coherency of verbal and visual expressions, and narrative knowledge, a quantitative experimental research design, specifically a pre-test and post-test with three experimental group and one control group, was employed in this study. "The basic intent of a true experimental design is to test the impact of a treatment (or an intervention) on an outcome, controlling for all other factors that might influence that outcome" (Creswell, 2009, p. 146). Therefore, in this study, the four levels of instructional approach (three scaffoldings and one non-scaffolding) were randomly assigned to the four second-grade classrooms. Students in the treatment groups received the standard instructional approach plus different scaffoldings (Figure 3). Students in the control group received the standard instructional approach with no scaffolding. Specific statistical techniques were applied to examine the effect of the treatment (three types of scaffoldings) on students' learning outcomes during the study, while controlling the factor of students' prior knowledge that might influence the learning outcomes.

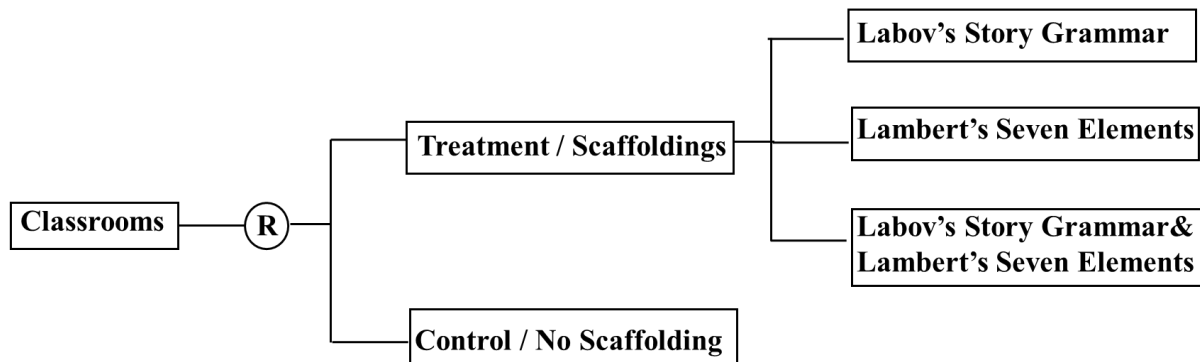


Figure 3. Quantitative experiment design with completely randomized to classrooms

A quantitative approach is one in which the investigator primarily uses post-positivist claims for developing knowledge (i.e., cause and effect thinking, reduction to specific variables

and hypotheses and questions, use of measurement and observation, and the test of theories), employs strategies of inquiry such as experiments, and collects data on predetermined instruments that yield statistical data (Creswell, 2009). From this perspective, the researcher tested a theory by specifying narrow hypotheses and the collection of data to support or refute the hypotheses. In general, an experimental design is used in which attitudes are assessed both before and after an experimental treatment. The data are collected on an instrument that measures attitudes, and the information collected is analyzed using statistical procedures and hypothesis testing (Creswell, 2009).

Details of this methodology were described in the following sections: (1) Research Context, (2) Participants and Sampling Methods, (3) Participant Protection, (4) Variables, (5) Research Hypotheses, (6) Experiment Procedure, Instrumentation and Technology, (7) Instructional Procedures, (8) Data Collection, (9) Methods of Analysis.

Research Context

This study was conducted at a university laboratory school in an urban area in the East Baton Rouge parish of Louisiana. This lab school consists of an elementary, middle, high school, and an International Baccalaureate (IB) Diploma Program. This is one of the six schools operated under the auspices of the Louisiana State University College of Human Sciences and Education. This school is accredited by the Southern Association of Colleges and Schools (SACS) and the Louisiana Department of Education. The mission of the school is “total effort in every endeavor”. In addition, it has been recognized as a school of Academic Distinction. University Lab elementary and middle school students exceed the state average scores in English/Language Arts, math, science, and social studies as measured by the Louisiana Educational Assessment Program. A total of 1,418 students are enrolled in this school and the racial make-up primarily as White (75%), African American (21%), Hispanic (2%), Asian/Pacific Islander (1%), and other

(1%). Only two percent of the 1,418 students here received reduced lunch prices. The ratio of students to teachers is approximately 23:1.

Participants and Sampling Methods

A total of 104 second-graders in four classrooms participated in this study. Specifically, there were 26 students (boys and girls were evenly distributed) in each classroom. Given existing classroom structures and teacher preferences, random assignment by individual student was not possible. Therefore, in this case, random assignment to condition was completed at the classroom level.

Participant Protection

The National Institutes of Health Human Subjects Certification was completed online. The permission was also obtained from the principal of the school in which the research was conducted. Forms were created, and distributed and collected in order to obtain parent permission for all students under the age of eighteen in the study. The identities of the students in this study were protected by generating unique codes for each student's identification. This information was stored digitally and password protected. This research was conducted for the doctoral degree of educational research program at Louisiana State University; therefore, an Institutional Review Board (IRB) exemption was received in order for the study to proceed.

Variables

Independent Variable

In this study, the independent variable was the instructional approach in the four classrooms. Specifically, there were four levels of this instructional approach: standard instruction with no scaffolding for control group, standard instruction with Labov's story grammar scaffolding for the experimental group 1, standard instruction with Lambert's seven elements scaffolding for the experimental group 2, standard instruction with both Labov's story

grammar and Lambert's seven elements scaffoldings for the experimental group 3.

Dependent Variables

This study was comprised of four dependent variables: story content, story structure, coherency of visuals and verbal materials, and narrative knowledge. In order to answer the first research question, the dependent variable story content was comprised of four components: focus/setting, organization/plot, narrative techniques, and language (or language convention of grammar and usage and language conventions of capitalization, punctuation, and spelling) (EGUSD Curriculum and Professional Learning Department, 2015). In order to answer the second research question, the dependent variable story structure was adopted from McCabe and Peterson (1984). In order to answer the third research question, the dependent variable is the level of coherence for visuals and verbal representations in a digital story (Lambert, 2007; Lambert, 2013). In order to answer the fourth research question, the dependent variable was students' narrative knowledge.

Research Hypotheses

A hypothesis is a specific statement of prediction. Based on the quantitative experimental design in this study, in order to make a prediction regarding the relationship between the independent variable and the dependent variables, the research hypotheses were proposed and provided as below according to each research question.

Research Question 1: How providing the instructional scaffoldings influence the content of stories wrote by second grade students?

Null hypothesis: there were no significant differences between groups with respect to the content quality of the stories that students wrote.

Alternative hypothesis: At least one group differed significantly from the other groups with respect to the content quality of the stories that students wrote.

Research Question 2: How providing the instructional scaffoldings influence the structure of the digital stories told by second grade students?

Null hypothesis: there were no significant relationship between groups and each type of story structure produced by these students.

Alternative hypothesis: there were significant relationship between groups and each type of story structures produced by these students.

Research Question 3: How providing the instructional scaffoldings influence the coherence of visuals and verbal representations in the digital story produced by second grade students?

Null hypothesis: there were no significant differences between groups in terms of their performances in the coherency of verbal and visual expressions.

Alternative hypothesis: at least one group significantly differed from the other groups in terms of their performances in the coherency of verbal and visual expressions.

Research Question 4: Do instructional scaffolding improve students' narrative knowledge by the end of the study?

Null hypothesis: there were no significant differences between groups in terms of their post-test on narrative knowledge after adjusted for their pre-test scores.

Alternative hypothesis: at least one scaffolding group significantly differed from the other groups in terms of their post-test on narrative knowledge after adjusted for their pre-test scores.

Instrumentation, Experimental Procedures and Technology

Common Core Narrative Rubric.

The narrative rubrics for the Common Core were developed by the Elk Grove Unified School District (EGUSD) in Elk Grove, California (EGUSD Curriculum and Professional Learning Department, 2015). To support the closing of the achievement gap, the Curriculum and

Professional Learning Department (2015) developed curriculum and course standards and benchmarks in addition to providing curriculum support to all schools. From 2010, the EGUSD supports and implements the common core state standards in Elk Grove Unified School District in Elk Grove, California by using the common core writing rubrics. The EGUSD created Common Core State Standards-aligned writing rubrics as a resource to assist teachers with this work. These rubrics are intended to help in instructional planning and to provide guidance in assisting students with the writing process. The second grade narrative rubrics are comprised of focus/setting, organization/plot, narrative techniques, language convention of grammar and usage, language conventions of capitalization, punctuation, and spelling. The scoring criteria includes above grade level (4 points), at grade level (3 points), approaching grade level (2 points), below grade level (1 point) (EGUSD Curriculum and Professional Learning Department, 2015) (Appendix A). To use the rubric to evaluate student's story content, the evaluator should determine the number of points achieved in each category and sub-category.

Digital Storytelling Evaluation Rubric

The digital storytelling evaluation rubrics were adopted from the Center for Digital Storytelling- seven elements of digital storytelling as outlined in Lambert's digital storytelling cookbook (2007). The evaluation rubric categories are point of view, dramatic question, script/voice, emotion, images, economy, and credit. The scoring criteria includes excellent (4 points), good (3 points), satisfactory (2 points), need improvements (1 point) (Matthews-DeNatale, 2008) (Appendix B).

Narrative Knowledge Assessment

Narrative knowledge includes knowledge about narrative structure and the relations among these structures (Linebarger & Piotrowski, 2009). General narrative knowledge were assessed via a test that the researcher created based on review of prior literature (Linebarger &

Piotrowsk, 2009; McCabe & Peterson, 1984). The purpose of this test (Appendix D) was to evaluate students' knowledge about story structure and narrative writing. In this test, firstly students were given several sentences with pictures unrelated to the digital storytelling project and were asked to put these sentences in the correct order (i.e. sequencing). Secondly students were given a set of four photographs and were asked to write a caption for each picture; each caption should describe what they see in the photograph. This test was assigned twice with the same items prior and after the digital storytelling project. Points were given for correctly sequencing the sentences and adequately describing the pictures. Sentences and pictures for this assessment were selected from sequencing tasks found on Education.com website.

Sequencing was coded using a 6-point scale: 0 = no sentences in correct order/no answer; 1= only one sentence in correct order; 2 = two sentences in correct order; 3 = three sentences in correct order; 4= four sentences in correct order; 5= five sentences in correct order; 6= all sentences in correct order. Picture writing was coded using a 4-point scale: 0 = no sentences are relevant to the four pictures/no answer; 1 =one picture has relevant caption; 2 = two pictures have relevant captions; 3= three pictures have relevant captions; 4= all pictures have relevant captions. The total correct score for the task is 10-point.

Experimental Procedures

Experimental group 1. Labov's story grammar scaffolding was implemented in the experimental group 1, particularly at the planning, writing and revision phase of digital storytelling. Details were presented in the section of instructional procedures. The information about this scaffolding (Table 4) was discussed in this section. The story grammar was developed by the sociolinguist William Labov in his research essay "The Transformation of Experience in Narrative Syntax" in 1972. He isolated recurring narrative features in face-to-face storytelling. He proposed that a narrative normally begins with an orientation, introducing and identifying the

participants in the action: the time, the place, and the initial behavior; and end by a coda, a statement that returns the temporal setting to the present, precluding the question, “and what happened then?” (Labov, 1972). The middle of the story should follow the order of narrative clauses matches the order of events as they occurred.

Table 4

William Labov’s Story Grammar (1972)

Category	Definition
1. Abstract	It consists of one or two clauses of describing or summarizing the story you will tell at the beginning of the narrative.
2. Orientation/setting	It introduces characters, temporal, and background environment.
3. Complicating action	It consists of one or series of event sequences leading up to their climax, the point of maximum sequence.
4. Evaluation	It states or emphasizes what is interesting or important of the story to their audiences, why the audiences should keep listening and allow the teller to keep talking.
5. Results or resolution	It releases the tension and end the story.
6. Coda	It consists of a short passage that announces the story is over or connecting the meaning of the story to the present.

Experimental group 2. Lambert's seven elements scaffolding was implemented in the experimental group 2, particularly at the design, construction and revision phase of digital storytelling. Details were presented in the section of instructional procedures.

Table 5

Seven Elements of Digital Storytelling (Lambert,2007)

Elements	Definition
1. Point of View	What is the main point of the story and what is the perspective of the author?
2. A Dramatic Question	A key question that keeps the viewer's attention and will be answered by the end.
3. Emotional Content	Serious issues that come alive in a personal and powerful way and connects the story to the audience.
4. The Gift of your Voice	A way to personalize the story to help the audience understand the context.
5. The Power of the Soundtrack	Music or other sounds that support and embellish the storyline.
6. Economy	Using just enough content to tell the story without overloading the viewer with too much information.
7. Pacing	The rhythm of the story, specifically deals with how slowly or quickly the story progresses.

The information about this scaffolding (Table 5) is discussed in this section. The seven elements of digital storytelling were first introduced by the center for digital storytelling in 2007. Later, Lambert adopted and refined the seven elements in his book “Digital storytelling cookbook”. The Center for Digital Storytelling has defined seven elements for creating effective and interesting multimedia stories (Lambert, 2007). Constructing a story is not a simple process that follows a recipe or prescribed formula. Many practitioner-based literature address that these elements require consideration for every story and determining the balance each element occupies in the story can take a lot of thinking and re-thinking (Bull & Kajder, 2004; Kieler, 2010; Robin, 2008; Shelby-Caffey et al., 2014).

Experimental group 3. Both two above scaffoldings: Labov’s story grammar and Lambert’s seven elements, were implemented at the story writing, design, construction and revision phase of digital storytelling for the experimental group 3. Specifically, Labov’s story grammar (Table 4) informed the basic structure of a story that students need to build at the planning and writing phase. Lambert’s seven elements (Table 5) provided a practical guideline to support students to develop high-quality digital stories at the design and construction phase. Details were presented in the section of instructional procedures.

Control group. Students in this group followed the same process of story writing, story design, story creation, and story revision, except that no scaffolding were implemented at each phase. Details were presented in the section of instructional procedures.

The Digital Storytelling Application—Windows Movie Maker

In order to enable students to create stories freely in a digital environment, this study utilized Windows Movie Maker to enable students to convert their personal stories into short movies that could be saved and uploaded onto YouTube and other websites. This application enabled students to edit via importing videos, adding images, text, music, narration and special

effects, to tell via voice recording, and to frame in the storyboard for their digital stories. All students were provided the specific guideline (Appendix C) about how to use this application.

Application supporting students in creating their stories freely includes a storyboard pane. Students employed the storyboard pane to look at the sequence or ordering of the clips in their stories and easily rearrange them, if necessary. This view also let them see any video effects or video transitions that have been added. They could also preview all of the clips in current story. Audio clips that they have added to a story were not displayed on the storyboard; however, they were displayed in the timeline. The imported images, videos, and narration were displayed in two views, the storyboard and the timeline (Figure 4).

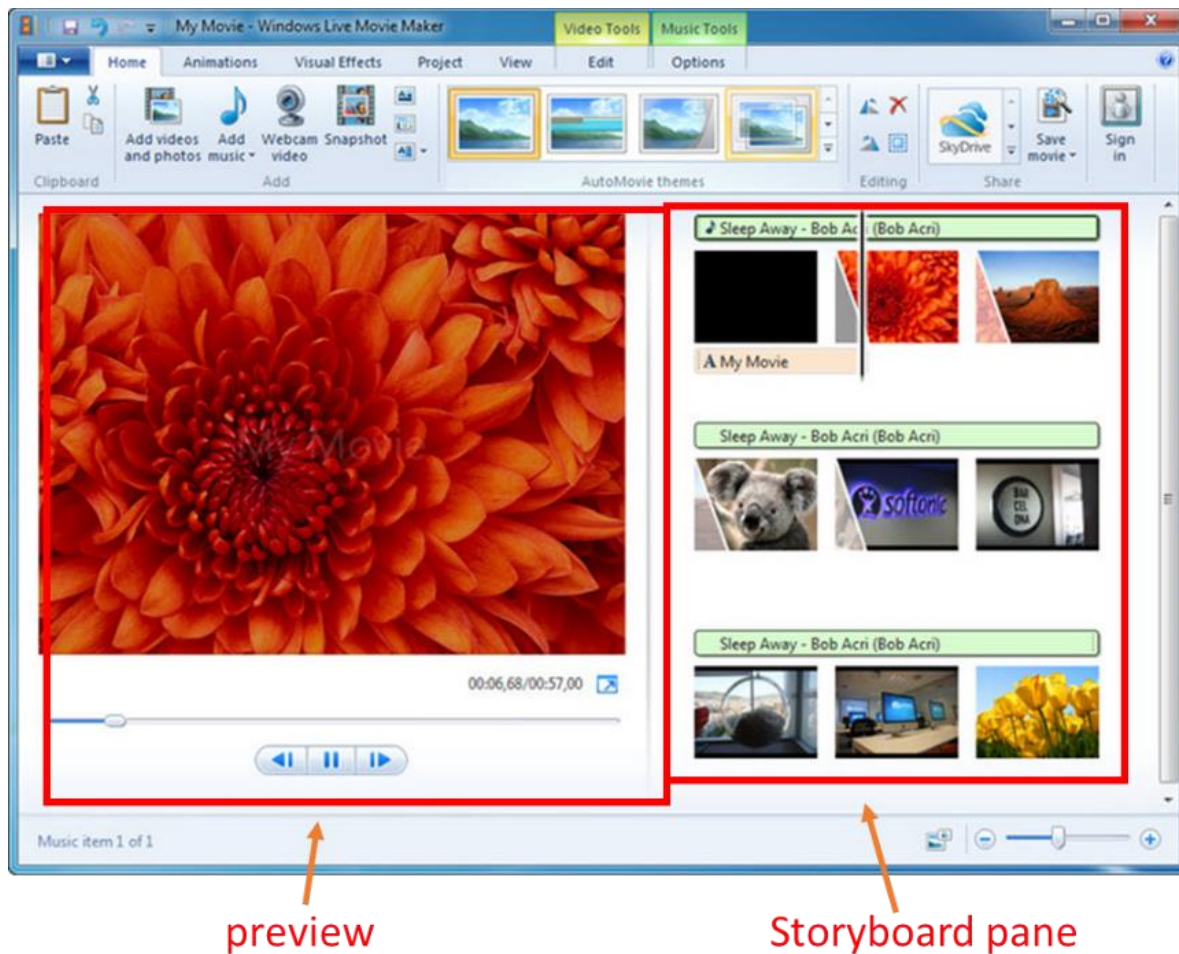


Figure 4. Screen shot of windows movie maker

Instructional Procedures

This research study was conducted over a period of 15 weeks, starting from the beginning of September in 2016. The researcher, also acted as a role of instructor, designed specific lesson plans according the eight steps of digital storytelling (Figure 5), and conducted mini lessons at each week of the study for each group. From lesson three to lesson seven, the scaffoldings were implemented to the three experimental groups.

Week 1 and Week 15: Narrative Knowledge Test

The goal of this test was to test participants' narrative knowledge in order to understand whether the participation of the digital storytelling project promoted their narrative writing skills and narrative structure knowledge by the end of this study. Students were given a narrative knowledge test (Appendix D) at the first week of study. They were given the same test again by the end. The test consists of two components: narrative structure and narrative writing. First, students were given several sentences with picture illustration and were then asked to put the sentences in the correct order. Second, students were shown four pictures in a predetermined order and were then asked to describe what they see in each picture and write sentences under each picture.

Week 2 Lesson One: Introduce Digital Storytelling.

The first lesson started with a conversation about students' experiences with digital sound, video, and storytelling. The goal of this lesson was to prepare participants with the knowledge about what is digital story and how to make a good digital story. The researcher introduced the concept of digital storytelling to all participants. Subsequently, the researcher organized students to watch a YouTube video about a project that their peers have participated in the process of digital storytelling and their perceptions about making a digital story.

Week 2 Lesson Two: Introduce Moviemaker Software.

The goal of this lesson was to help participants understand and master the basic operations of the Movie Maker software. In this lesson, the Windows Movie Maker software was introduced to the students with an explanation of how to create a digital story using this software; various features and options available in Movie Maker were demonstrated (Appendix C). The interactive white board in each classroom was employed to demonstrate the features of the Movie Maker. Consider the current level of participants' technology skills, it is necessary to understand their prior knowledge about technology (e.g., typing, keyboard, editing etc.) before implementing the explicit training sessions. Specifically, the researcher conducted a practice session using this software with four students from the two experimental groups prior to the formal training. For example, two students (one boy who adept at manipulating the computer and one girl who is novice) were purposefully selected from the experimental group 2. Contrarily two students (one boy who is inexperienced and one girl who is "tech expert") were purposefully selected from the experimental group 3. The selected participants were taught one-on-one with respect to the basic options of this software.

Week 3 to Week 5 Lesson Three: Brainstorm A Story

The goal of this lesson was to build a personal story. Typical expected duration was 1 to 3 days per week. In this lesson, student started to determine topics about their personal stories (e.g. describe a personal experience), then jotted down ideas, organized the ideas and generated the initial narrative for their stories. In this lesson, the experimental group 1 and 3 were given a story map (Appendix E) to scaffolding their story construction. Specifically, in week 3, all groups received 17 narrative writing prompts (Appendix J) for sparking students' story ideas; after they chose the topic, the groups with story maps started to organize story ideas and write them down on the map; whereas the groups without story maps wrote down or drew ideas on a

piece of blank paper. In week 4 and week 5, all groups worked on drafting stories based on the ideas they generated.

Week 6 to Week 7 Lesson Four: Revising Stories

The goal of this lesson was to refine students' story by self-checking and receiving feedback from the researcher. After completing the first draft of story, all groups revised and corrected grammar and spelling errors occurred on the first draft, an editing checklist (Appendix H) was used in this lesson to help children revise their writing. Meanwhile, the researcher reviewed their writing and provided constructive suggestions on their stories. In particular, the story grammar group completed a checklist (Appendix G) to enhance their awareness for developing complex story plots.

Week 8 Lesson Five: Search the Material.

The goal of this lesson was to search and collect relevant images (e.g., online pictures, personal /family photos, drawings, etc.), audios and videos. Before creating storyboards, students collected the materials required to create the digital story over a period of 1 to 2 days. They freely decided whether to gather real photos at home, or search online pictures at classroom's computers or draw some pictures for their stories. The story grammar: abstract, orientation or setting; complicating action, evaluation, results or resolution, and coda (Labov, 1972), scaffold the story design with appropriate digital elements to support story structure in experimental group 1 and 3. The seven elements of digital storytelling provided by Lambert (2007): point of view, dramatic question, emotional content, economy, pacing, the gift of your voice, and soundtrack, scaffold the plan of putting the visual materials in the right order, and thinking about how to match images or videos with the voiceover text and music in experimental group 2 and 3.

Week 9 to Week 12 Lesson Six: Creating A Storyboard

Storyboarding is an important component in planning out a visual story. The goal of this

lesson was to create the storyboard. In this lesson, the researcher explained how to import pictures and videos into Microsoft Movie Maker software to all students and helped them sequence the pictures in order in the storyboard (Appendix C). Particularly this lesson enables students to practice technology skills in the creation process. Due to the amount of work associated, the duration of this lesson was about 8 days, the longest among digital story creation steps. The estimated duration was 45 minutes per day. Six or more students of each group took turn to use the Movie Maker in the classroom for each day, depending on how many computers available in each room. Specifically, they created and organized their visual materials in the storyboard pane of the Movie Maker based on their unique storyline.

The story grammar are: abstract, orientation or setting; complicating action, evaluation, results or resolution, and coda (Labov, 1972), as rule-based scaffoldings to inform their story structure in experimental group 1 and 3. The seven elements of digital storytelling provided by Lambert (2007) are: point of view, dramatic question, emotional content, economy, pacing, the gift of your voice, and soundtrack, as rule-based scaffoldings to plan the visual materials in the right order, and thinking about how to match images or videos with the voiceover text and music in experimental group 2 and 3.

Week 13 Lesson Seven: Creating the Digital Story

The goal of this lesson was to edit and refine the storyboards in the Movie Maker. All students were required to record their voices and use them within the story. All students created their own digital stories based on the storyboard by importing the ideas to the Movie Maker, and recording their voice to add to the narrative, and testing if it worked effectively with the digital story. They also added special effects and adjusted the length of each visual element. This was achieved by choosing and adding some special effects, such as music and transitions, to make the story more attractive, adjusting the length of each visual element to make sure it matches the

narration, and this was done over the entire digital story.

The story grammar are: abstract, orientation or setting; complicating action, evaluation, results or resolution, and coda (Labov, 1972), as rule-based scaffoldings to inform their story structure in experiment 1 and 3. The seven elements of digital storytelling provided by Lambert (2007): point of view, dramatic question, emotional content, economy, pacing, the gift of your voice, and soundtrack, scaffolding their planning of the visual materials in the right order, and shape their thinking about how to match images or videos with the voiceover text and music in experimental group 2 and 3. For group 2 and 3, the researcher scaffold a lesson about skillful expressions in storytelling in order to emphasize the characteristics of digital storytelling. Specifically, she taught students from those groups about how to use voices in the storytelling including 1. Emphasis on key words; 2. Emotional coloring; 3. The volume of voice (high or low); 4. The rate of voice (fast or slow); 5. The pitch of voice; 6. Pause. In order to get students actively engaged in the process, the researcher offer extra bonus for students who showed excellent performance in storytelling.

Week 14 Lesson Eight: Editing and Feedback.

This lesson was aimed at editing and finalizing the digital story, after students has created its first version. The duration of this lesson was 2 days. In this lesson, the three experiment groups received some feedback from the researcher according to the respective scaffolding strategies to incorporate further improvements before the final draft of the digital story. In particular, the experimental group 2 and 3 completed a checklist (Appendix F) to reinforce their awareness of a good digital story. The control group received some feedback but no scaffolding related. All students revised and edited the digital stories based on the researcher's comments and feedback. Then they discussed the final digital products with the researcher and classmates.

Week 15 Lesson Nine: Presentation and Evaluation

The final step of digital story creation was about presenting and evaluating the finalized digital stories over 2 days. The researcher and four teachers attended the student presentation, and evaluated them based on story quality, story structure and presentation. The sole responsibility of the students in this lesson was to present the digital story to everyone.



Figure 5. The display of digital storytelling creation process

Data Collection

Prior to the study, students' narrative knowledge were assessed based on the pre-test in order to gather their prior knowledge about narrative. After the study, students' narrative knowledge were assessed again based the same test, referred as post-test. A total of 104 students' scores on pre-tests and post-tests were collected. During this study, research data was collected based on the progress students completed in each lesson. In lesson three, students' initial personal narrative scripts were first collected. Subsequently, the researcher collected students' first version of digital stories before comment and feedback. Then, their final digital story

products were collected. Finally, students' oral narrative recordings in the Movie Maker were also collected and transcribed by the researcher. Therefore, the total collected data included: students' scores on pre-tests and post-tests, written stories, spoken story transcriptions, and digital story products.

Methods of Analysis

One-Way Analysis of Variances (ANOVA)

In order to understand how providing rule-based scaffoldings may influence the content quality of stories and digital storytelling artifacts produced by students, two rubrics—common core narrative rubric (EGUSD Curriculum and Professional Learning Department, 2015) and digital storytelling rubric (the Center for Digital Storytelling, 2008) were employed to evaluate story content quality and technical quality. Because of the fact that these stories were displayed as sequences of frames that contained images together with vocal narration, music, video and transition effects, the storytelling process was similar to that of producing a movie, but on a smaller scale. Therefore, the common core narrative rubric examined thoroughly the four dimensions on which the content and grammar were assessed. The digital storytelling rubric examined thoroughly the four dimensions on which the technical quality was assessed. A series of separate one-way ANOVA was used to determine whether there were differences among the four groups, three experiment groups with scaffoldings in each lesson and the control group without any scaffoldings in each lesson, on each scaling dimension based on the two scoring rubrics.

Correlational (Chi-Square) Analysis

In order to understand how providing rule-based scaffoldings may influence the story structure that students tell, all students' oral narrative transcripts were analyzed and classified by the researcher into three theoretical narrative structures according to McCabe and Peterson's

(1984)—episodic structure, high point structure, and dependency structure (Table 6). Chi-Square test of independence was used to compare whether the two categorical variables were dependent or not. The two categorical variables were: group and the narrative structure.

Table 6

The Theoretical Structure Of Oral Narratives Analysis (McCabe & Peterson, 1984)

Episodic Structure	High Point Structure	Dependency Structure
Descriptive sequence	Disoriented	Simple coordinate sequence
Action sequence	impoverished	Simple subordinate sequence
Reactive sequence	chronological	Combination of a simple coordinate with a simple subordinate sequence
Abbreviated episodes	Leapfrogging pattern	Mixed coordinate sequence
Complete episode	Ending-at-the-high-point pattern	Mixed subordinate sequence
Complex episode	Classic pattern	Ideal hierarchy
Interactive episode		
Multiple structure narrative		

Paired Sample Mean T-Test and Analysis of Covariance (ANCOVA)

A series of paired sample mean t-test was used in this study to analyze students' learning gain before and after this study in each separate group according to their narrative knowledge test. In addition, an analysis of covariance (ANCOVA) was conducted to test if there were

statistically significant differences in the narrative knowledge post-tests between groups when adjusted for the narrative knowledge pre-test (covariate). In order to increase the internal validity of the research design, all participants received the test (mentioned in the experiment procedure section) assessing their narrative knowledge prior to this study. The intent of the pre-study analysis was to ensure that all participants in the four groups had approximately equivalent narrative skills prior to this study. This is a useful way to reduce any bias or experimental noise in the final results. The intent of the post-study analysis using the same test was to examine the extent of overall effectiveness of the rule-based scaffoldings on students' narrative knowledge after this study, whether there was a learning gain on students in this study. The researcher examined how four groups' learning gain changed from the beginning to the end, whether one, two or all groups improved over time. If the control group also showed a significant improvement, then the researcher must attempt to uncover the reasons behind this.

Chapter 4: RESEARCH RESULT

This study was designed to examine the effect of two rule-based instructional scaffolds: story grammar and seven elements of digital storytelling on second grade students' content of written stories, structure of oral telling stories, the coherence of producing visuals and verbal elements in their digital stories, as well as narrative knowledge. Data included 104 story rough drafts and final drafts, 104 students' voice recordings, 104 digital story products, and 104 pre-test and post-test scores about narrative knowledge on structure and writing.

The results of this research are reported in the following subsections of this chapter: (1) information about each student's project folder; (2) analysis of students' written story content; (3) analysis of students' spoken story structure; (4) analysis of the level of coherence about visual and verbal components in students' digital stories; (5) analysis of students' pre-test and post-test on narrative knowledge.

Information about the Student's Project Folder

A total of 104 second-graders' project folders were collected by the end of this study. Specifically, in experimental group I, each project folder contained a student's story map, learning resources including a list of transition words and an excellent student writing sample, first writing draft, final writing draft, a movie script and a voice recording. In the experimental group II, each project file contained a student's story ideas (texts or drawings), learning resources including a list of adjectives and the seven elements of digital storytelling, first writing draft, final writing draft, a movie script and a voice recording. In experimental group III, each project folder contained a student's story map, learning resources including a list of transition words, a list of adjectives, the seven elements of digital storytelling and an excellent student writing sample, first writing draft, final writing draft, a movie script and a voice recording. In the

control group, each project folder contained a student's story ideas (texts or drawings), first writing draft, final writing draft, and a voice recording. In addition, each student saved his or her story materials: music, video, pictures, and photos that related to his or her story topic in a flash drive or a disk.

Story Topics and Ideas

At the beginning of the study, students received 17 narrative writing prompts to guide them to select a story topic (Appendix J). Among these prompts, three top popular topics that were frequently chosen by students were a). "Write about the best vacation you ever took. What did you do?" b). "Write a story about a memory that you'll never forget. Why does this experience mean so much to you?" c). "Write about a time when you got hurt playing outside. What happened?" In the experimental group 1, the most popular topic that students chose was "Write about a time when you got hurt playing outside." in the experimental group 2, the top popular topic that students chose was "Write about the best vacation you ever took. What did you do?" in the experimental group 3, the most popular topic that students chose was "write about your most prized possession. Why do you value the object?" in the control group, the most popular topic that students chose was "Write a story about a memory that you'll never forget. Why does this experience mean so much to you?".

Students in the experimental groups with story grammar scaffolding used story maps to organize their story ideas (Appendix K), the hint of transition words in the map demonstrated a clear development line that helped them strictly follow the story grammar. They built story plots embedded within a clear logic flow. This logic flow motivated them to develop well-formed, more sophisticated story structures (Labov, 1972; Stein & Glenn, 1979; Liu et al., 2011) than the groups without story maps. This was also confirmed by the findings in the following sections.

Analysis of Students' Written Story Content

This section focused on analyzing how providing rules-based scaffoldings may influence the content of stories wrote by second grade students. A total of 104 written narratives were collected and analyzed by the researcher. In order to increase the inter-rater reliability of the scoring rubric, a second-grade teacher who received the master's degree of education at Louisiana State University was invited to rate 28 students' writing samples (approximately 26 %) in the study. These 28 students were randomly selected with 7 students from each group. The researcher and the teacher both reached an approximately 82% (23 of 28) agreement on the category of focus/setting and narrative techniques, an approximately 71.5% (20 of 28) agreement on the category of organization/plot; and an approximately 23% (10 of 28) agreement on the category of grammar & usage and capitalization, punctuation & spelling. For the disagreement, the two raters decided to average the two different scores in order to get a fair score on each category until we reached a consensus for all ratings.

Table 7 displays the comparisons of the four groups: experimental group 1—story grammar scaffolding, experimental group 2—Labov's seven elements scaffolding, experimental group 3—story grammar and Labov's seven elements scaffoldings, and the control group—no scaffolding, across the five categories of the scoring rubric. An analysis of variance (ANOVA) was conducted and the results show that the stories written by students across the four groups were scored significantly different in overall content quality ($p < .01$, reject the null hypothesis), including the aspects of story focus, organization, narrative techniques, language conventions of grammar and usage, and capitalization, punctuation and spelling. The effect size is .747.

In order to clearly understand the specific difference between groups, a post-hoc analysis of ANOVA was conducted. The results showed that the three experimental groups performed

significantly better than the control group in the aspects of story focus ($p < .01$), organization ($p < .01$), narrative techniques ($p < .01$), language conventions of grammar and usage ($p < .01$), and capitalization, punctuation and spelling ($p < .01$), as compared to the control group. In particular, in the aspect of story organization, the experimental group 1 ($p = .049$) and experimental group 3 ($p = .012$) both scored significantly better than the experimental group 2. The post hoc results demonstrated that with rule-based scaffoldings, students could create higher quality of story content; in addition, the results also supported the thesis that with story grammars, students' stories were more well-organized by adding temporal words and phrases that produced a clear closure of structure.

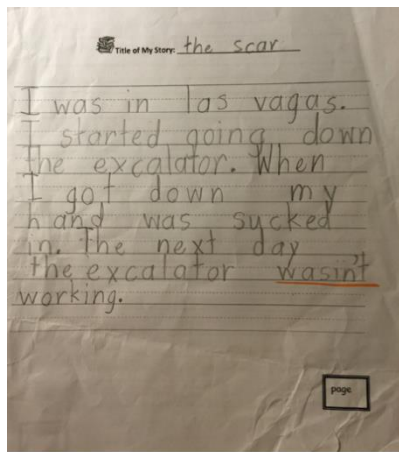
The variation in story organization among the four groups might make one assumption that the rule-based scaffoldings perhaps led students to produce diverse story structure, which exhibited creative storytelling. For example, Figure 6 showed one of the stories wrote by each group. The control group did not use any transitional words (e.g., first, next, then, last) to signal the event order. Instead, the story plots interleaved without a logical flow. The student used limited words to describe the story background, insufficient details to recount the event about his injury during the vacation in Las Vegas. The researcher judged this story was even incomplete because no relevant information or further actions that led to the end of the story. On the other hand, any of the three experimental groups performed better in the story construction. For instance, the experimental group 1 and 3 that used story grammar produced a coherent storyline with a well-elaborated recount of an event or short series of events. In addition, when reviewing these writing samples, the reviewers surprisingly noticed that the experimental group with story grammar tended to produce a well-organized storyline, whereas the experimental group with seven elements tended to create vivid details (a variety of adjectives) that described actions, thoughts, and feelings. For example, the story from experimental group 2 was a story about a trip

Table 7

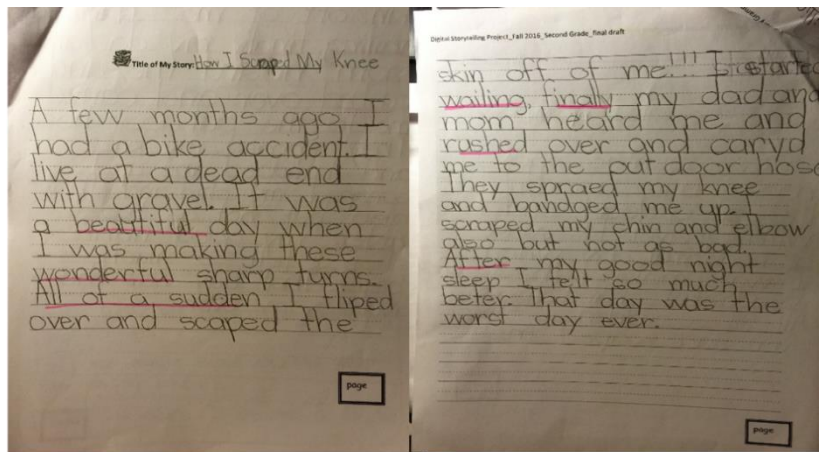
The Comparison of the Story Content among the Four Groups

Category	Group	<i>N</i>	<i>M</i>	<i>SD</i>	<i>F</i>
Focus	Experimental 1	26	6.72	0.97	13.55**
	Experimental 2	26	6.79	1.14	
	Experimental 3	26	6.75	0.76	
	Control	26	4.92	1.89	
Organization	Experimental 1	26	6.50	0.85	19.75**
	Experimental 2	26	5.87	1.02	
	Experimental 3	26	6.68	0.69	
	Control	26	4.46	1.75	
Narrative Technique	Experimental 1	26	3.18	0.39	13.95**
	Experimental 2	26	3.27	0.49	
	Experimental 3	26	3.22	0.33	
	Control	26	2.36	0.95	
Grammar & Usage	Experimental 1	26	13.58	0.98	13.17**
	Experimental 2	26	13.85	1.10	
	Experimental 3	26	14.11	0.89	
	Control	26	11.36	3.10	
Capitalization, Punctuation & Spelling	Experimental 1	26	8.98	1.07	12.63**
	Experimental 2	26	8.53	1.10	
	Experimental 3	26	9.29	0.85	
	Control	26	6.97	2.39	

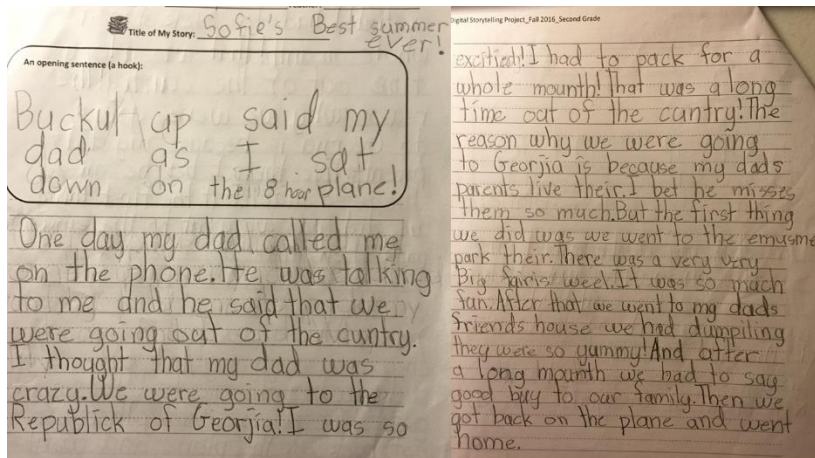
Note. Experimental 1—story grammar scaffold, Experimental 2—seven elements scaffold, Experimental 3—story grammar & seven elements scaffolds, Control—no scaffold. ** $p < .001$



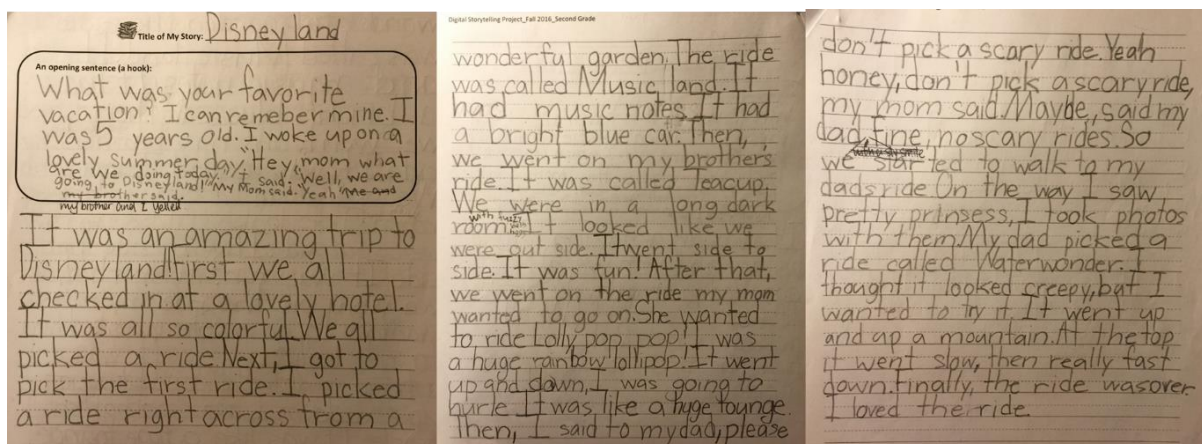
Control Group



Experimental Group I



Experimental Group II



Experimental Group III

Figure 6. The display of a student's written story sample from each group.

to visit her relatives outside of the United States. Her story began with an opening sentence that is a narrative technique to “hook” the audience’s attention and thus they want to continue to engage with the story. She employed action statement for opening lines to give the audience a great sense of imagination about what happened in her story (setting, situation, and characters). Another example in the story from experimental group 3 also demonstrated how the writer elaborated on the opening statement for introducing the background information of the story, and getting the reviewers aroused and interested in keeping reading the story. Besides, students’ handwriting in the experimental groups were much better (neater and nicer) as compared to the control group. In general, the above finding shed light on the further investigation on students’ story episodes (the constituents of information), story development (the importance of two functions of oral narratives: reference and narrative), and its linguistic form such as syntactic complexity that were exemplified in the particular oral narrative discourse.

Analysis of Students’ Spoken Story Structure

This section focused on analyzing how providing rules-based scaffoldings may influence the structure of the stories told by second grade students. From the findings of the previous section, it has been proven that the rule-based scaffoldings influenced the quality of story content that students wrote. Therefore, we might hypothesize that such scaffolding strategies influenced the structure of story that students produced as well. Corresponding to previous literature, Berman (2016) emphasized that how students tell a story orally and in writing manifest distinctiveness in their linguistic literacy and linguistic expression. During the process of digital storytelling, students recorded their vocal narration by telling their written stories. Although a well-planned speech differed from improvisation to some extent, students were still nervous when telling their written stories in front of their classmates. Therefore, as Berman (2016) stated, all students produced more extensive outputs and resources to use of “ancillary material” such as

reiterations, false starts, hesitation markers such as pause in their oral stories, as compared to their written stories. In particular, the control group produced more false starts, reiterations, and pause (e.g. em, well, ok) in their oral narratives, as compared to the experimental groups. One speculation to this finding was that the scaffolding groups might have more chances to be exposure to the written texts because students in these groups were required to follow the designated rules in the story creation process. The familiarity of the text information might influence the fluency of speech. In addition, Berman (2016) emphasized that students' verbal production in speech resulted in longer than writing. Correspond to Berman (2016), the mean text length produced from their oral narrative were longer than that from their written stories in general from the findings.

The theory of oral narrative discourse analysis was based on McCabe and Peterson's study on exploration about the characteristics of oral narrative of personal experiences produced by 3 to 9 years old children in 1984. Their thesis that supported the story structure analysis was based on three type of information: Stein and Glenn's (1979) episodic story grammar, Labov's (1972) high point analysis, and Deese's (1983) dependency analysis. The three types of analysis worked on the development of young children's oral narratives but with different emphases. For example, Stein and Glenn's episodic or story grammar approach focused on the macro-structure of event sequence: precipitating events, internal motivating states such as affects, cognition or goals that motivated the protagonist, plan actions (attempts and consequences), and reactions that were precipitated by events, attempts, or consequences. Labov's high point focused on the semantic function and form of such presentation of personal experience. He defined a narrative as "one method of recapitulating past experience of events which actually occurred (Labov, 1997, p.287). For both the high point analysis and the episodic analysis, narratives were analyzed primarily with respect to their content—what information they conveyed and the order of that

information. However, Deese's dependency analysis primarily focused on the syntactic form, relying upon statements of important propositions as its unit of analysis. In other word, this analysis primarily examined the micro-structure of its linguistic form and linguistic discourse. Therefore, the following three sub-sections demonstrated the research findings from respective perspective: episodic structure, high point structure, and dependency structure. The researcher analyzed 104 spoken story transcripts in terms of each type of story structure.

Story Episodic Structure

From the perspective of story episode, Stein and Glenn (1979) emphasized that stories were logical sequences of information or statements, and these statements could be classified into informational categories such as events, motivating states, setting etc. Therefore, in this study the unit of analysis for the story episodic analysis was the statement that convey important distinctions. Most sentences or clauses of students' spoken stories were separate statements; however, a single sentence could be parsed into more than one statement. For instance, one student said "we went to Florida to see my cousins" would be considered two statements: "we went to Florida" was a goal-directed action, whereas "to see my cousin" was the goal.

When analyzing students' spoken story transcripts, the researcher basically focused on the these functional categories: the settings (introduction of the background information of the story including time, situation, place and characters that involved); the motivating states (goals that motivate the action, internal feelings, habitats, likes and dislikes, personality traits, etc.); the plan actions (including attempts that were actions that were initiated by an event or a motivating state, and consequence that were actions that directly achieved or failed to achieve a goal); the abstracts (the summary of the whole story); the coda (the endings of a story); and the judgements (students' thoughts or comments on the narrated event). Among these categories,

the event and the plan applications (attempts and consequence) were two important categories that formed a complete episode. Without any of the three, it is incomplete, and it would be just the action sequences or descriptive sequences.

Table 8

Structural Patterns of Narratives in Episodic Grammar

Structural pattern	Definition
Descriptive sequences	Describe character(s), surroundings, and habitual actions with no causal relationships
Action sequences	Is a list of actions that chronologically rather than causally ordered
Reactive sequences	Is a set of changes that automatically cause other changes with no planning involved
Abbreviated episode	Describes aims of a protagonist, but planning generally must be inferred
Complete episode	Also describe aims but exhibits more evidence of planning.
Complex episode	Is an elaboration of a complete episode in one of four ways : <ul style="list-style-type: none"> (1) By an embedded reactive sequence (2) By an embedded complete episode (3) By a multiple plan application (e.g., repeated attempts) (4) By a multiple plan application with an embedded complete episode
Interactive episode	Describe one set of events from two perspectives, where both people have goals and influence each other.

Note. This table was adapted from “What makes a good story?” by A. McCabe and C. Peterson, 1984, *Journal of Psycholinguistic Research*, 13(6), p.457-480.

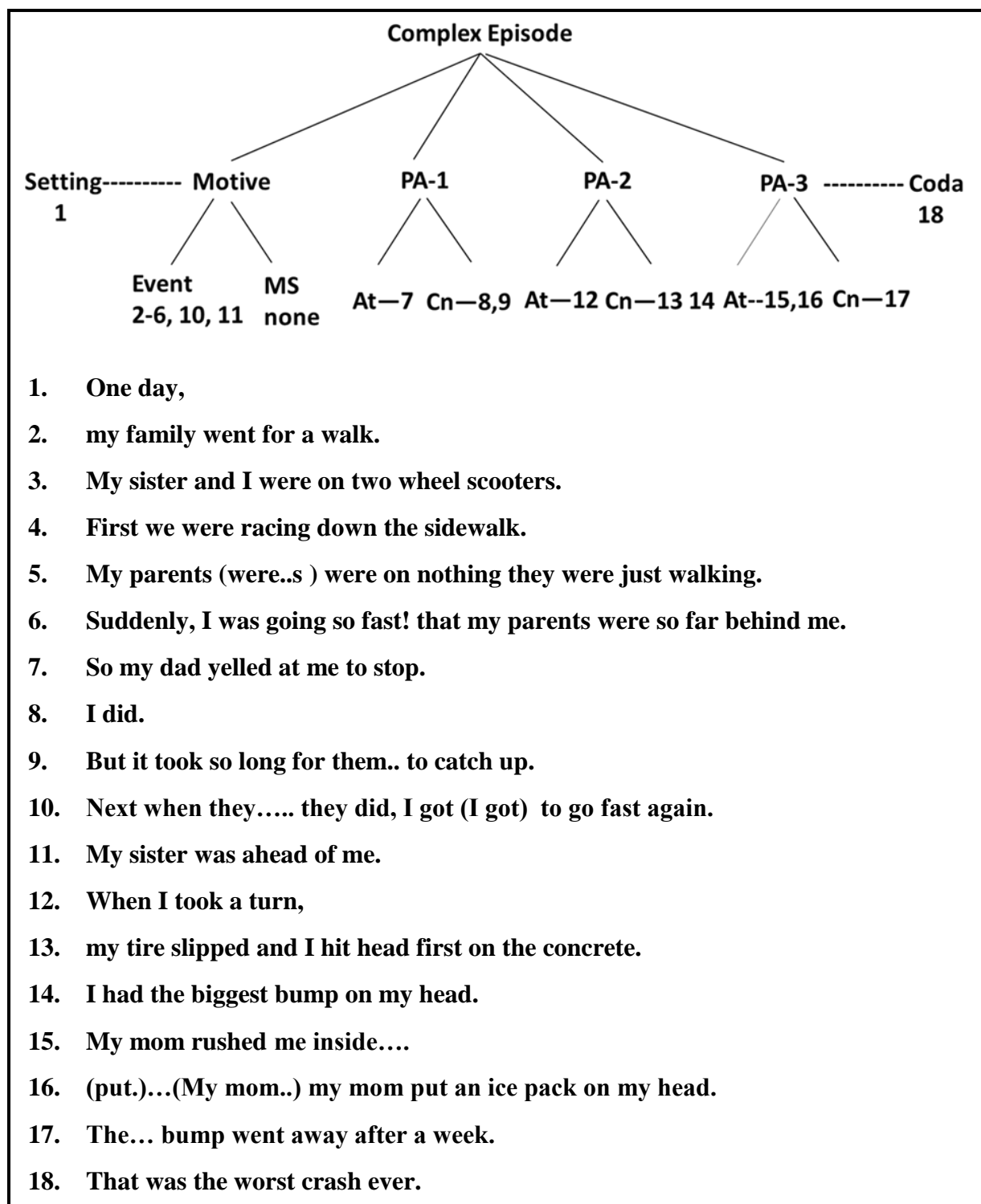


Figure 7. One student's spoken story transcript in the experimental group 1, a complex episode in episodic analysis.

Therefore, based on these informational clues, the researcher classified the oral narrative transcripts into these structural patterns with respect to the episodes: descriptive sequence, action

sequence, reaction sequence, abbreviated episode, complete episode, complex episode, and interactive episode. Corresponding to Peterson and McCabe (1983), the structure of one student's oral narrative could have more than one pattern. For example, Figure 7 demonstrated a student's episodic structure that not only had the third type of complex episode that a multiple plan applications (PA) included, but also embedded the reactive sequence within the event. Many of students' oral narratives could not be classified as a single category, but rather were multiple structure narratives. Therefore, the total number of episodic structures produced by students was 192. The classification of these structures in each group was shown in Table 9.

Table 9

Relationship between Groups and Episodic Structure

Group	Descriptive sequence	Action sequence	Reactive sequence	Abbreviated episode	Complete episode	Complex episode	interactive episode
Experimental 1	9 (6.43)	2 (8.69)	0 (3.59)	1 (2.27)	20 (8.51)	4 (5.67)	0 (1.13)
Experimental 2	13 (8.67)	12 (11.73)	4 (4.85)	2 (3.06)	10 (11.48)	5 (7.65)	3 (1.53)
Experimental 3	4 (12.92)	16 (17.48)	15 (7.22)	4 (4.56)	12 (17.1)	19 (11.4)	3 (2.28)
Control	8 (5.98)	16 (8.1)	0 (3.34)	5 (2.11)	3 (7.92)	2 (5.28)	0 (1.06)

Note. Experimental 1—story grammar scaffold, Experimental 2—seven elements scaffold, Experimental 3—story grammar & seven elements scaffolds, Control—no scaffold. Observed frequencies were printed above (expected frequencies).

The frequency of students' plan actions within episodic structure in each group was shown in Table 10. The average of the number of structures produced by all students was approximately 2. A series of chi-square of independence tests were conducted to examine the

possible association between groups and the presence or absence of each type of episodic structure. The findings showed that the scaffold or non-scaffold instruction were significantly associated with the presence or absence of action sequences (Pearson Chi-Square = 11.216, $df = 3$, $p = .011 < .05$; Phi coefficient = .328). The strength of this association is 32.8%. (small to medium). Unlike the experimental group 2 and 3, the experimental group 1 and the control group respectively yielded a big difference between the observed value and the expected value. This means, the researcher might think that the group with story grammar scaffolding did not produce as much action sequence structures as expected, whereas the group with no scaffold produced more action sequence structures than expected.

Table 10

The Classifications of Plan Applications (PA) Accompanied with The Episode Structure

Group	1 PA	2 PAs	3 PAs	Multiple PAs
Experimental 1	11	7	0	1
Experimental 2	8	5	0	0
Experimental 3	9	6	6	2
Control	5	2	0	0

Interestingly, if the researcher further reviewed the values for the two groups across all the categories, few students in the story grammar group produced action sequence structures resulted in more produced complete episodes in that group; whereas more students in the no scaffold group produced action sequence structures resulted in less produced complete or even complex episodes in that group. Corresponding to Peterson and McCabe (1983), descriptive sequence, action sequence and reactive sequence were three simplest structures that younger children tended to produce; whereas abbreviated episode, complete episode, complex episode

and even interactive episode were complicated structures that required higher-level narrative skills. Apparently, the use of story grammar (story map) helped students build more sophisticated story structure as compared to the group without story grammar (story map).

Moreover, the scaffold or non-scaffold instruction were significantly associated with the presence or absence of the complete episode (Pearson Chi-Square = 13.908, $df = 3$, $p = .003$; Phi coefficient = .366). The strength of this association was 36.6% (small to medium). Also, the scaffold or non-scaffold instruction were significantly associated with the presence or absence of the complex episode (Pearson Chi-Square = 33.917, $df=3$, $p = .000$; Phi coefficient = .571). The strength of this association was 57.1% (medium). In particular, the experimental group 3 performed relatively better because students in this group produced more complex episodes that required an elaboration on the complete episode than expected. Corresponding to Peterson and McCabe (1983) and Liu et al., (2014), the model of plot structure or story grammars provided frames for students to describe and analyze a story in a coherent way. However, the rules of seven elements provided information for students to elaborate the story by including vivid details and a variety of adjectives that describe actions, feelings, and thoughts. When two types of information were effectively implemented, students would produce more complex structures that entailed elaboration and complication of the basic story grammar described in the beginning, middle, and end of the story.

High Point Structure

From the perspective of high point, the narrative clause was the unit of analysis when analyzing students' story structure. Typically, this type of analysis was invented by William Labov (Labov & Waletzky, 1967). He summarized five types of independent narrative clauses: complicating actions, resolutions, appendages, orientation, and evaluation. The details of each

type of narrative clause were provided in Table 11. Therefore, when analyzing students' high point structure, the researcher scored each of these main clauses and figured out how the sequence of clauses of the story were related to the sequence of events which occurred. As Peterson and McCabe proposed, two timelines were involved in narrative analysis: the timeline of the actual experience (in what order did the event happen?) and the timeline of the narrative (how were these events recapitulated).

Table 11

Type of Clauses in High Point Analysis

Type	Definitions
Complicating Action	Specific events which occur before the evaluative high point of the narrative.
Resolution	Specific events which occur after the high point, and resolve the high point action or crisis.
Appendages	Abstract—summaries of the narrative that occur at the beginning.
	Attention-Getters—Explicit bids for listener attention.
	Coda—Formalized endings of a narrative.
Orientation	Statements that provide the setting or context of a narrative, including participants, time, location, general conditions etc.
Evaluation	Statements or words that tell the reader what to think about a person, place, thing, event, or the entire experience, including: internal emotional states, objective or subjective judgements etc.

Note. This table was adapted from “What makes a good story?” by A. McCabe and C. Peterson, 1984, *Journal of Psycholinguistic Research*, 13(6), p.457-480.

The manipulations of the timeline of the original events were considered as a way to help the researcher classify students' story into its corresponding structural pattern. There were seven

Table 12

The Structural Pattern of Narrative in High Point Analysis

Structural Pattern	Definitions
Classic Pattern	The narrative builds up to a high point, evaluatively dwells on it, and then resolve it.
Ending-at-the High Point Pattern	The narrative builds up to a high point and then ends; there is no resolution.
Leap-frogging Pattern	The narrative jumps from one event to another within an integrated experience, leaving out major events that must be inferred by the listener.
Chronological Pattern	The narrative consists of two few sentences for any high point pattern to be recognized, or the narrative extensively reiterates and evaluates only two events.
Impoverished Pattern	The narrative consists of too few sentences for any high point pattern to be recognized, or the narrative extensively reiterates and evaluates only two events.
Disoriented Pattern	The narrative is too confused or disoriented for the listener to understand.
Miscellaneous Pattern	Any narrative that does not fit into one of the above categories is classified as miscellaneous.

Note. This table was adapted from “What makes a good story?” by A. McCabe and C. Peterson, 1984, *Journal of Psycholinguistic Research*, 13(6), p.457-480.

structural patterns of narratives in high point analysis: the classic pattern, the ending-at-the-high point pattern, leap-frogging pattern, chronological pattern, impoverished pattern, disoriented pattern, and miscellaneous pattern. The definitions of each pattern were provided in Table

12. Students' oral narrative transcripts were independently classified as belonging to one of the described pattern above by the researcher (Table 13). According to the chi-square of independence tests, the scaffold or no scaffold instruction were significantly associated with the primitive structural pattern (leap-frogging pattern, impoverished pattern, disoriented pattern, and miscellaneous pattern) (Pearson chi-square = 15.78, $df = 3$, $p = .001$; Phi coefficient = .39). The strength of this association was 39% (small to medium). As we can see from the Table 13, the observed frequencies of the three experimental groups close to their expected frequencies; however, the observed frequency of the control group is larger than the expected. Therefore, the researcher might infer that students were more likely to produce simple structural pattern when no scaffold implemented in the process of storytelling.

Table 13

Relationship between Groups and High Point Structure

Group	Primitive	Chronology	Ending at the High Point	Classic
Experimental 1	4	8	3	11
	(6)	(5.75)	(4.75)	(9.5)
Experimental 2	3	6	10	7
	(6)	(5.75)	(4.75)	(9.5)
Experimental 3	3	1	5	17
	(6)	(5.75)	(4.75)	(9.5)
Control	14	8	1	3
	(6)	(5.75)	(4.75)	(9.5)

Note. Experimental 1—story grammar scaffold, Experimental 2—seven elements scaffold, Experimental 3—story grammar & seven elements scaffolds, Control—no scaffold. Observed frequencies were printed above (expected frequencies).

Next, according to the chi-square of independence test, the scaffold or no scaffold instruction were significantly associated with the ending-at-the-high point pattern (Pearson Chi-Square = 11.527, $df = 3$, $p = .009$; Phi coefficient = .333). The strength of this association was 33.3% (small to medium). Specifically, the observed frequencies of the experimental group 1 and 3 close to their expected; however, the observed frequency of the experimental group 2 was larger than expected, whereas the observed frequency of the control group was smaller than expected (See Table 13). The researcher might think that more students produced primitive high point structure in their spoken narratives resulted in less produced higher-level structure in the control group; interestingly, when the seven elements of digital storytelling was implemented, the manner of high point structure pattern change that more students tended to produce stories with surprise endings. We might think that the seven elements rule scaffold provides opportunity for student to spark creative expression that more sophisticated story developmental patterns were built during this study. For example, Figure 8 demonstrated that a student in the group with seven elements rules scaffold only created a story about her little brother. She used extensive evaluation comments to express her emotions and judgements when talking about what her little brother is like and how she loves him. The story evaluatively dwelled on the recapitulating the past experiences about the moment when her brother was born; and then reached to the high point “I love my brother to death!”.

Last, according to the chi-square test, the scaffold or no scaffold instruction were significantly associated with the classic pattern (Pearson Chi-Square = 13.6, $df = 3$, $p = .004$; Phi coefficient = .362). The strength of this association was 36.2% (small to medium). Except the experimental group 1 and 2, the other two groups’ observed frequencies were not quite the same as the expected. For example, in the experimental group 3, less students produced primitive structure pattern result in more students produced the classic pattern which is the perfect

structural pattern in the high point analysis according to Peterson and McCabe (1983). On the contrary, only few students could produce a verbal sequence of clauses in a delicate storyline development.

1. I wish I had a sibling... (Internal emotional states)
2. ..I said to my mom.
3. A month later, I did!! (setting)
4. The moment I (meet)... met my new born baby brother Beau...
5. I instantly fell in love with him. (Internal emotional states)
6. Even though he was kind... of smelly, (judgement)
7. I still loved him. (Internal emotional states)
8. I wanted to squeeze him so... tight (Internal emotional states)
9. but did not because he was very fragile. (judgement)
10. so I did not want to hurt him. (Internal emotional states)
11. His eyes sparkled like fireworks. (judgement)
12. He was the chubbiest, cutest, most handsome big baby! (judgement)
13. I wish he could be in Mrs. Crutti's class (with)...with me and I.. (Internal emotional states)
14. I would play with him at recess. (Internal emotional states)
15. That is so much I love him. (Internal emotional states)
16. About 1 year ago, (setting)
17. I was begging and I mean begging for a brother. (Internal emotional states)
18. When I found out my brother.... Beau was a boy (setting)
19. I was mad (Internal emotional states)
20. because I wanted a sister. (Internal emotional states)
21. But at the end I realized brothers are better than sisters. (judgement)
22. But I do not know why I liked my brother more than I would like sister of my own.
(Internal emotional states)
23. I love my brother to death! (Internal emotional states)
24. I hope you get to meet him one day. (coda)

Figure 8. The display of one student's spoken story transcript in the experimental group 2

For example, Figure 9 demonstrated a narrative produced by a student in the experimental group 3. She recapitulated her memory about a very scary dream and elaborated on the specific event, setting, people, and endings. This story built up to a high point as she described a huge shark came for her and bit off her leg, and then dwelled on describing her feelings, thoughts and actions she did when injured, and then the story reached to a happy ending after her family were rescued by the water police. Unlike the other stories that happened in the real world, she elaborated the nightmare in a coherent and delicate manner.

1. Once upon a time on a normal day, I had a bad dream out of nowhere!
(Setting) (Abstract)
2. My family and I were in the sea. (Setting)
3. When we were there,... (Setting)
4. I saw a huge,... fierce shark..... (Judgement)
5. The worst thing was that it was coming for me! (Internal emotional states)
6. It (bite)...bit off my leg.
7. I was so scared!!! (Internal emotional states)
8. Finally, we got on an island and I...
9. ..My dad stitched my leg up.
10. Then we got some fast food
11. and then it was the end of the day.
12. I was so happy that I was ok. (Internal emotional states)
13. But before we went home,
14. We looked around
15. (Then).. And.. I see...I saw that we were still in the middle of the sea!!
16. So my dad called the water police, they brought us home.
17. We were so happy then. (Internal emotional states)
18. We lived so... happy since then. (Judgement)
19. That was a scary dream! (coda)

Figure 9. The display of one student's spoken story transcript in the experimental group 3

In order to understand how rule-based scaffoldings influenced the productivity of narrative clauses in each single narrative, the independent clauses in each student's story were classified according to the type of narrative comment as shown in Table 14. Firstly, the majority of the evaluation comments (76.38 %) were produced by the experimental group 2 and 3. Secondly, more than half of the abstract comments (56 %) were produced by the experimental group 3; almost every student in the experimental groups made conclusions (coda) at the end of their stories. Lastly, the majority of attention-getters (85.7 %) were produced by the experimental group 2 and 3.

Table 14

The Comparisons of Type of Clauses Generated by the Four Groups

Group	Internal emotional states	Judgements	Setting	Abstract	Coda	Attention-getter
Experimental 1	29	25	33	3	20	2
Experimental 2	74	81	54	5	20	38
Experimental 3	78	55	31	19	21	28
Control	18	23	21	7	9	0
Total	199	184	139	34	70	77

Dependency Structure

From the perspective of dependency analysis, narratives were primarily examined with respect to their syntactic form. Therefore, in this study when analyzing students' spoken narrative transcripts, the unit of analysis is its proposition that concentrating on the syntactic complexity in a particular discourse (Peterson & McCabe, 1983). Unlike the high point analysis and episodic analysis which concentrated on what information they convey and the order of the

information, an independent clause in the dependency analysis could be frequently comprised of a number of small propositions.

For example, one student said “we were playing baseball last night at our cousin’s house.” The dependency analysis would be:

1. We were playing baseball

- 1.1 last night

- 1.2 at our cousin’s house

Here the most dominant proposition (1.) organized the (truncated) discourse as a whole, while a subordinate proposition (1.1 and 1.2) presented the detail (time and location) of the discourse.

There are six types of dependency structures that were applied in this study: simple coordinate sequence, simple subordinate sequence, combination of simple coordinate with simple subordinate sequence, mixed coordinate sequence, mixed subordinate sequence, and ideal hierarchy. The detail of each type of structure was shown in Figure 10. Therefore, in each narrative transcript, the researcher broke down the surface discourse into its component functional syntactic propositions according to its particular type of discourse. One hundred and four spoken narrative transcripts were independently classified into one of the dependency structural pattern as shown in Figure 10.

According to the chi-square of independence test, scaffold or no scaffold instruction were significantly associated with the simple coordinate sequence (Pearson Chi-Square = 46.746, $df = 3$, $p = .000$; Phi coefficient = .67). The strength of this association was 67% (medium to large). As we can see in Table 15, the observed frequencies of the experimental group 1 and the control group were larger than their expected; whereas the observed frequencies of the experimental

Table 15

Relationship between Scaffolding Groups and Dependency Structure

Group	Simple Coordinate	Simple Subordinate	Combination of simple Coordinate & Subordinate	Mixed Coordinate	Mixed Subordinate	Ideal Hierarchy
Experimental 1	16 (11)	0 (0.75)	1 (0.75)	5 (8)	3 (3.5)	1 (2)
Experimental 2	4 (11)	0 (0.75)	0 (0.75)	11 (8)	8 (3.5)	3 (2)
Experimental 3	1 (11)	2 (0.75)	1 (0.75)	12 (8)	3 (3.5)	4 (2)
Control	22 (11)	1 (0.75)	1 (0.75)	1 (8)	0 (3.5)	0 (2)

group 2 and 3 were smaller than their expected. From this result, the researcher might infer that the groups with seven elements of digital storytelling were less likely to produce simple sentences; in the contrary, the groups without seven elements were likely to produce the simple sentences or clauses with few elaborations on the lower levels of discourse. Meanwhile, according to the chi-square of independence tests, scaffold or no scaffold instruction were significantly associated with the mixed coordinate sequence (Pearson Chi-Square = 15.45, $df = 3$, $p = .001$; Phi coefficient = .385). The strength of this association was 38.5% (small to medium).

As we can see in Table 15, the observed frequencies of the experimental group 2 and 3 were relatively larger than their expected; whereas the observed frequencies of the experimental 1 and the control group were relatively smaller than their expected. This result also manifested that the groups with seven elements rule scaffold were more likely to elaborate the details in their stories as compared to the groups without seven elements rules. For example, Figure 11 demonstrated a spoken story transcript about one student's spoken narrative from the group with seven elements rule only. As we can see, the truncated narrative discourses were comprised of 9 dominant propositions, each dominant proposition had two or three subordinate propositions that they were parallel and coordinated with each other. According to the dependency analysis of this transcript as shown in Figure 12, the expansion was primarily in the form of both pure, flat proliferation and elaboration proliferation, but there was also a solitary shoot of elaboration in the branch 1.7. In this jungle of tree diagram, this structure resembled a bush with a shoot to a depth at least two levels below the depth of most of the narrative. Therefore, the researcher judged this dependency structure is the mixed subordinate sequence. According to Peterson and McCabe (1983), for the majority of children's (age 3.5 to age 9.5) narratives, their elaborations

were basically the expository description on a number of different things: objects, people, animals, locations, conditions of the environment, and a specific event (e.g., injuries).

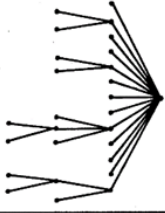
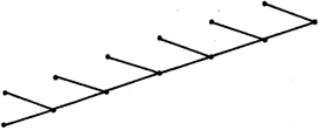
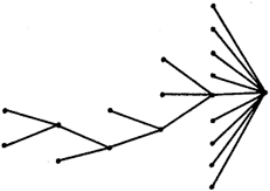
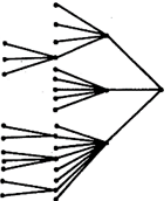
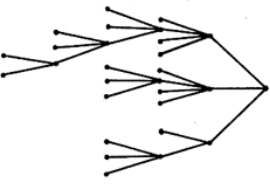
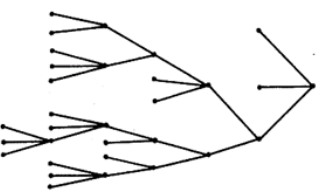
LABEL	SIMPLE COORDINATE SEQUENCE	SIMPLE SUBORDINATE SEQUENCE	COMBINATION OF SIMPLE COORDINATE WITH SIMPLE SUBORDINATE SEQUENCE	MIXED COORDINATE SEQUENCE	MIXED SUBORDINATE SEQUENCE	IDEAL HIERARCHY
LEVEL						
1						
2						
3						
4						
5						
6						
7						
DENSITY RATIO (Propositions)	$\frac{13 \text{ subordinate}}{13 \text{ at level 2}} = 1.0$	$\frac{10 \text{ subordinate}}{2 \text{ at level 2}} = 5.0$	$\frac{9 \text{ subordinate}}{9 \text{ at level 2}} = 1.0$	$\frac{27 \text{ subordinate}}{3 \text{ at level 2}} = 9.0$	$\frac{24 \text{ subordinate}}{3 \text{ at level 2}} = 8.0$	$\frac{27 \text{ subordinate}}{3 \text{ at level 2}} = 9.0$
PROLIFERATION	level 2	0	level 2	lower levels	lower levels	lower levels
ELABORATION	0	1 branch	1 branch	0	1 branch	many branches

Figure 10. A comparison of the properties of the different structures of dependency analysis (Peterson & McCabe, 1983, 121)

- 1. When I heard**
- 1.1 that we were going on a trip**
 - 1.1.1 to New York
 - 1.1.2 I was thrilled!
- 1.2 When we got off the plane**
 - 1.2.1 I was (so) excited!
 - 1.2.1.1 so
 - 1.2.2 So we could go explore New York!
- 1.3 I went to New York**
 - 1.3.1 because of (my brother 's) basketball tournament.
 - 1.3.1.1 my brother's
 - 1.3.2 and to have fun!
- 1.4 After my brother's basketball tournament,**
 - 1.4.1 we went to Dillan's Candy Bar.
 - 1.4.1.1 It is a factory
 - 1.4.1.1.1 with just candy!!
- 1.5 We stayed...**
 - 1.5.1 on a gian....(ginormous) house
 - 1.5.1.1 ginormous
 - 1.5.1.1.1 It had 3 stories
 - 1.5.1.1.2 And.. one floor was underground
- 1.6 I also went to San... San... Serendipity,**
 - 1.6.1 it is a (famous) place
 - 1.6.1.1 famous
 - 1.6.1.1.1 with (caramel) ice cream.
 - 1.6.1.1.2 caramel
- 1.7 I saw the Statue of Liberty.**
 - 1.7.1 And I thought it was tiny!
 - 1.7.1.1 because I was a (far) distance
 - 1.7.1.1.1 far
 - 1.7.1.1.1.1 from it
 - 1.7.1.2 But it is an...ac...(actually) (hu....)...enormous.
 - 1.7.1.2.1 actually
- 1.8 I had the best time**
 - 1.8.1 of my life
 - 1.8.1.1 in New York.
- 1.9 I want to go back....**
 - 1.9.1 next summer!

Figure 11. The display of one student's spoken story transcript in experimental group 2.

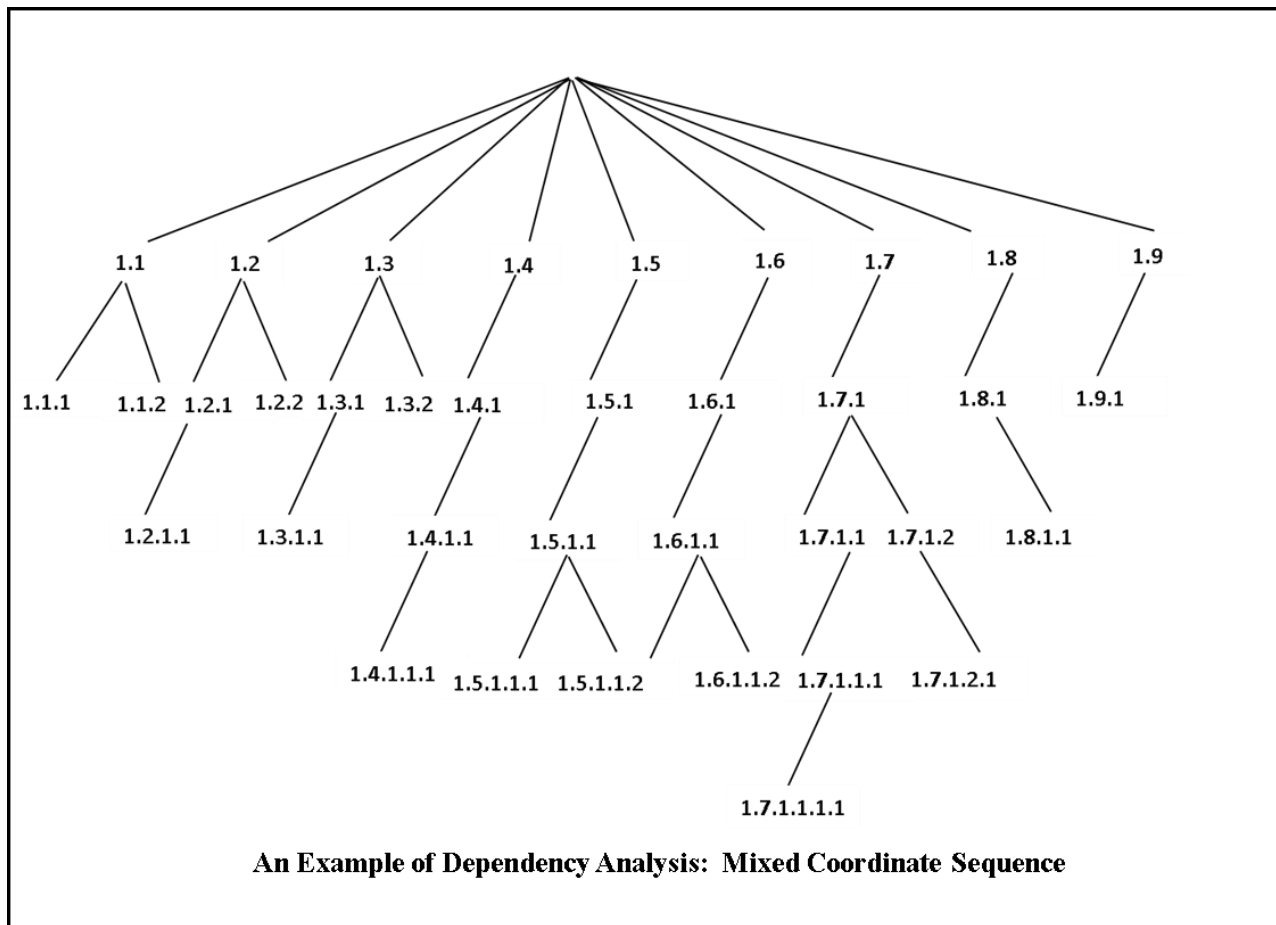


Figure 12. A tree diagram of dependency analysis about the story in Figure 11

The direction of the branch of the elaboration decides the type of dependency structure that the narrator pursued. However, Peterson and McCabe (1983) emphasized that a good narrative did not require syntactic elaboration; which means, children for this age range (3 to 9) commonly create coordinate sequence, either simple or mixed, based on their abilities. Therefore, they believe that a good personal narrative really only calls for expansion in terms of flat, or linear, proliferation as described in Figure 10. This is also the reason that in this study the students' narratives lingered between the simple coordinate sequence and the mixed coordinate sequence, though we still have few students in the three experimental groups were capable of sophisticated discourse structure like ideal hierarchy.

Analysis of the Digital Storytelling Performance

This section focused on analyzing how providing rules-based scaffoldings may influence the coherence of verbal and visual materials created by second grade students. A total of 104 final digital stories were collected and analyzed by the researcher. In order to increase the inter-rater reliability of the scoring rubric, the same teacher that mentioned in previous section was invited to rate 28 students' artifacts (approximately 26 %) in the study. These 28 students were randomly selected with 7 students from each group. The researcher and the teacher both reached an approximately 89 % (25 of 28) agreement on the category of vocal narration; a 100 % (28 of 28) agreement on the category of music; and an approximately 96 % (27 of 28) agreement on the category of image, and an approximately 78.6 % (22/28) agreement on the category of pace. For the disagreement, the two raters decided to average the two different scores in order to get a fair score on each category until we reached a consensus for all ratings.

As mentioned earlier in Chapter 2, Lambert's seven elements of digital storytelling were designed to enrich people's digital literacy experiences. Because the four categories of the digital storytelling evaluation rubric that implemented in this section were derived from the seven elements. The researcher might speculate that the two groups (experimental group 2 and 3) with seven elements rule scaffold performed better in the aspect of vocal narration, music, image and pacing, as compared to the groups (experimental group 1 and the control group) without such scaffold. As mentioned earlier in Chapter 3, the groups with seven elements rules' scaffold actively engaged in the process of planning the visual materials in the right order, and thinking about how to match images or videos with the voiceover text and music, receiving instruction about how to skillfully express feelings though telling stories. It turns out that they received more instructional support when dealing with the organization of visuals and verbal materials, as compared to the groups without seven elements rules' scaffold. Therefore, the researcher might

make a hypothesis that students in the groups with seven elements rule scaffold performed better in the digital storytelling with the aspect of vocal narration, audio effects, visual effects, and the rhythm.

Table 16

The Comparisons of Students' Performances in Digital Storytelling between Groups

Category	Group	N	M	SD	F
Vocal Narration	Experimental 1	26	3.08	0.34	38.204**
	Experimental 2	26	3.52	0.38	
	Experimental 3	26	3.49	0.43	
	Control	26	2.23	0.72	
Music	Experimental 1	26	3.28	0.45	14.259**
	Experimental 2	26	3.49	0.45	
	Experimental 3	26	3.52	0.45	
	Control	26	2.68	0.70	
Image	Experimental 1	26	2.87	0.39	12.091**
	Experimental 3	26	3.35	0.43	
	Control	26	2.56	0.81	
Pace	Experimental 1	26	2.84	0.40	38.916**
	Experimental 2	26	3.48	0.44	
	Experimental 3	26	3.51	0.33	
	Control	26	2.20	0.75	

Note: experimental 1—story grammar scaffold, experimental 2—seven elements scaffold, experimental 3—story grammar & seven elements scaffolds, control—no scaffold

** $p < .01$

According to the four separate one-way ANOVA tests, highly significant differences existed among the four groups in terms of vocal narration ($F = 38.204$; $p < 0.01$), music ($F = 14.259$; $p < 0.01$), image ($F = 12.091$, $p < 0.01$), and pace ($F = 38.916$, $p < 0.01$). The effect size is .53. Table 16 displays the comparisons of the mean scores on the digital storytelling performance among the four groups: experimental group 1, experimental group 2, experimental group 3, and the control group, across the four categories of the scoring rubric. As the researcher expected, the rule-based scaffold instruction successfully affected young children's digital storytelling performances. In order to explicitly exploring the difference, a post-hoc analysis of ANOVA was conducted between groups using Least Significant Difference (LSD) approach.

The results (Table 17) manifested that each of the three experimental groups performed highly significantly better than the control groups in terms of vocal narration ($p = .00$). Specifically, the quality of narrators' vocal narration were much better among the three rule-scaffold groups in that they skillfully convey meaning and intent of their digital stories in an attractive way. The pitch, inflection, and timbre of the narrators' voices were relatively more harmonious with the storyline they created, as compared to the control group. In particular, among the three scaffold groups, the group with seven elements rule performed highly significantly better than the group with the story grammar ($p_1 = .02$; $p_2 = .04$). This might be implied that the seven elements' rule maximally exploited students' potentials of using their own voices to express their stories.

In terms of audio effect (music), each of the three experimental groups performed highly significantly better than the control groups ($p = .00$) (Table 17). Current practitioner-based research addressed that properly employed music can enhance and underscore the accompanying stories, adding complexity and depth to the narrative (Bull and Kajder, 2004; Kajder, Bull & Albaugh, 2005).

Table 17

The Comparisons of Mean Scores on Each Category among the Four Groups

Category	(I)Group	(J) Group	Mean Difference (I-J)
Vocal Narration	Control	Experimental 1	-.845*
		Experimental 2	-1.28*
		Experimental 3	-1.25*
	Experimental 1	Experimental 2	-0.44*
		Experimental 3	-0.41*
Music	Control	Experimental 1	-0.6*
		Experimental 2	-0.81*
		Experimental 3	-0.84*
Image	Control	Experimental 1	-0.29*
		Experimental 2	-0.74*
		Experimental 3	-0.78*
	Experimental 1	Experimental 2	-0.45*
		Experimental 3	-0.48*
Pace	Control	Experimental 1	-0.64*
		Experimental 2	-1.28*
		Experimental 3	-1.31*
	Experimental 1	Experimental 2	-0.64*
		Experimental 3	-0.67*

*. The mean difference is significant at the 0.05 level.

Therefore, the rule-based scaffoldings effectively influenced the way students using to establish tone, mood, and emotional context that deepen the impact of the message. In terms of

visual effects (image), the experimental group 2 and 3 performed highly significantly excellent in employing visual materials to decorate, illustrate or illuminant the information they conveyed in the story, as compared to the control group ($p = .00$). Because the mean value of the experimental group I was marginally significantly higher than that of the control group ($p = .54$) and significantly lower than the other two experimental groups ($p_1 = .002$; $p_2 = .004$). There is a good reason to believe that it was the seven elements rule scaffold that effectively influenced students' experiences in multimodal (verbal mode and visual mode) communications.

General speaking, Lambert's seven elements of digital storytelling was effectively implemented in the classroom so that students' creativity and artistic expressions were successfully promoted, corresponding to Yuan and Bakian-Aaker (2015).

Last but the most important, the pace of a digital storytelling is an essential component for making a good, inspiring masterpiece. When analyzing the groups' mean values on the category of pace, the groups with seven elements rule scaffold were extraordinarily outstanding than the groups without such scaffold ($p = .00$). In addition, without seven elements rule scaffold, the group with the story grammar scaffold performed significantly better than the group without any scaffolds ($p = .00$). This result is similar to the above; which have proven that Lambert's seven elements effectively incorporated the main characteristics of digital storytelling into instructional settings as well as effectively guided young children in the way of creating a high-quality digital story.

Analysis of Narrative Knowledge

This section focused on testing whether the digital storytelling experience influenced students' narrative knowledge including knowledge about the narrative structure and narrative writing by using paired t-tests on each group. In addition, the researcher want to further examine

whether providing rule-based scaffoldings in the digital storytelling process effectively discriminated students who performed better in narrative knowledge test at the end of the study by using one-way ANCOVA. The assumptions of normality and homogeneity of variance were checked and met at the phase of preliminary analysis.

Table 18 displays the comparisons of students' pre-test and post-test mean values in the aspect of narrative structure, narrative writing, and the overall performance, in the four groups. According the paired t-test on each group, for the experimental group I, students' performances in the aspect of narrative knowledge ($t = -3.76, p = .001$) narrative writing ($t = -5.54, p = .00$) and the overall performance ($t = -6.24, p = .00$) were highly significantly improved by the end of this study as compared to their pre-tests. For the experimental group II, students' performances in the aspect of narrative knowledge ($t = -2.63, p = .014$) narrative writing ($t = -6.45, p = .00$) and the overall performance ($t = -5.01, p = .00$) were highly significantly improved by the end of this study as compared to their pre-tests. For the experimental group 3, students' performances in the aspect of narrative knowledge ($t = -6.63, p = .00$) narrative writing ($t = -6.27, p = .00$) and the overall performance ($t = -5.57, p = .00$) were highly significantly improved by the end of this study as compared to their pre-tests. For the control group, students' performances in the aspect of narrative writing ($t = -5.57, p = .00$) and the overall performance ($t = -3.72, p = .001$) were highly significantly improved by the end of this study as compared to their pre-tests.

According to the one-way ANCOVA, the researcher did not detect any significant differences in students' narrative knowledge post-tests between groups by the end of the study ($F = .982, p = .405$; partial eta square = .029). That is to say, the rule-based scaffoldings did not effectively discriminate students in their narrative knowledge tests by the end of the study. However, corresponding to Sarica and Usluel (2016) and Xu et al., (2011), the digital storytelling

experience did effectively enhance all students' narrative skills including knowledge about the story structure and the story writing skills by the end (Table 18).

Table 18

The Comparisons of Students' Performances in the Pre-test and the Post-test

Group	Type	Pre-Test		Post-Test	
		Mean	Std. Deviation	Mean	Std. Deviation
Experimental 1	Narrative Structure	2.54*	1.90	4.12*	1.77
	Narrative Writing	2.07*	1.00	3.34*	.67
	Overall	4.61*	2.10	7.46*	1.97
Experimental 2	Narrative Structure	2.88*	1.58	4.04*	2.05
	Narrative Writing	1.88*	1.02	3.26*	.70
	Overall	4.77*	2.10	7.3*	2.57
Experimental 3	Narrative Structure	2.19*	1.33	4.58*	1.68
	Narrative Writing	2.27*	.64	3.36*	.65
	Overall	4.46*	1.70	7.90*	1.88
Control	Narrative Structure	3.27	1.99	4.04	1.59
	Narrative Writing	1.94*	1.06	3.16*	.62
	Overall	5.21*	2.77	7.19*	1.69

Note. Experimental 1—story grammar scaffold, experimental 2—seven elements scaffold, experimental 3—story grammar & seven elements scaffolds, Control—no scaffold

* $p < .05$

Overall Performance

In order to examine students' overall performances on story content, coherency of verbal and visual expressions, and post-test on narrative knowledge, one way ANOVA analysis was performed and significant differences were detected between groups ($F = 95.61, p < .05$; partial eta square = .73). A post hoc analysis using LSD approach was conducted, the scaffolding groups significantly outperformed as compared to the non-scaffolding group (Table 19). In addition, the experimental group 3 significantly outperformed than the experimental group 1.

Table 19

One Way ANOVA for the Overall Performances on Story Content, Coherency and Narrative Knowledge Post-Test Between Groups

Groups	N	Mean	Std. Deviation
Experimentall	26	58.47	4.44
Experimental 2	26	59.39	4.67
Experimental 3	26	61.84	3.94
Control	26	38.06	8.65

Chapter 5: DISCUSSIONS

The primary goal of this study was to examine how providing rule-based scaffolding influenced second-grade students' digital storytelling, in the aspect of written story content, spoken story structure, coherence of visuals and verbal representations, and narrative knowledge. In order to accomplish this goal, a quantitative, true experimental design with a control group, which focused on comparing the effects of scaffold and non-scaffold instructional strategies, was employed. This study was implemented in the context of college preparation school with high academic distinction. Research participants consisted of 104 second-grade students who had no experience with digital storytelling. However, they actively engaged in the story creating process so that the designated scaffolding were effectively implemented in the experimental groups. Although the control group did not receive any scaffoldings, students in this group still involved an effort to achieve a relatively high level of narrative writing and storytelling in the classroom. Students' story content were assessed with regard to the five aspects: focus/setting, organization/plot, narrative techniques, language conventions of grammar and usage, and language conventions of capitalization, punctuation, and spelling. Students' story structures were analyzed from the perspective of story episode, story high point, and syntactic complexity respectively. Students' digital stories were evaluated based on the coherency of verbal and visual representations in the entire storyline. Students' narrative knowledge were assessed in terms of their awareness of story structure and the knowledge of narrative writing. Thus, results from this effort have allowed the researcher to draw conclusions based upon the findings and provide future researchers with suggestions for further research on this topic. This chapter addressed: (1). Conclusions; (2). Implications of this study; (3). Recommendations for future research.

Conclusions

Within each phase of this study, pertinent data was gathered to assist in answering proposed research questions. The implementation of William Labov's story grammar in digital storytelling inspired the researcher in terms of how to foster young students in writing well-organized, sophisticated narratives. The implementation of Lambert's seven elements of digital storytelling illuminated practical implications for promoting young children's new literacy skills in the school setting. Therefore, based upon the findings within this study, the following sections contained conclusions that were discussed and organized by Research Questions.

Research Question 1: How providing the instructional scaffoldings influence the content of stories wrote by second grade students?

Narrative writing is the first phase in the digital storytelling (Lambert, 2007; Robert, 2008). In this study, all children within this phase followed the Hayes and Flower (1981) cognitive writing process: pre-writing, writing, and rewriting. Based upon this model, children wrote stories following Bereiter and Scardamalia's Knowledge Telling Model (1987), using both prior knowledge about narrative as well as narrative schema to create and organize story ideas. The apparent distinction was that children with narrative schema tended to form elaborative, high-quality content than those without schema, corresponding to Liu et al., (2011) and Liu et al., (2014). For example, the first phase within this study reveals that children tended to create well-formed, sophisticated stories when story grammar elements were effectively given as hints in the process of writing. Recipients of rule-based hints produced a greater number of frames that enable them to create coherent sentences and clauses. Those hints facilitated them to make more transitions between story elements and produce a variety of events and outcomes. In particular, the implementation of story grammar in the writing process stimulated children's acquisition of knowledge about the basic story elements. It helps them understand what constitutes a story and

how to create one. This is necessary in the English language art instruction where the curricular objective is to encourage reading and writing.

In addition, corresponding to current practitioner-based research, the light also shed on the seven elements of effective digital stories developed by Lambert in 2007. Therefore, the result of the study conducted here demonstrated that the two types of rule-based scaffolds effectively facilitated students' digital stories in these aspects: plan of stories, design action or dialogues, maintenance of a logical storyline, and creation of new ideas. Although the seven elements rule-based scaffolding was not quite effective in the writing phase, it uniquely involved in achieving the essential writing objectives that helps writers sharpen the focus of the story and think about what is essential to the story. In general, the two rule-based scaffoldings effectively enhanced the quality of story content at the first stage of digital storytelling.

Research Question 2: How providing the instructional scaffoldings influence the structure of stories told by second grade students?

From the perspective of story episode, the rule-based scaffolding of story grammar effectively assisted young storytellers in developing stories with more complete and complex episodes; clearer subjects; more creative ideas; as well as more abundant contents than those without story grammar, corresponding to Dymock (2007) and Liu et.al (2011). Providing the story grammar reinforced young storytellers' understanding of episodic structure, which is essential to the good storytelling. However, the rule-based scaffolding of seven elements, to some extent, did not enhance storytellers' awareness of episodic knowledge; therefore, they did not increase the level of story plot complexity in the storytelling, when comparing the story grammar scaffolding. From the perspective of high point, providing the story grammar motivated young storytellers to develop the classic (adult) pattern of story. However, it is also important to reveal that providing the *Seven Elements* not only increased children interest and

aroused expression of personal feelings; but also stimulated them to express perspectives toward the people, subject, and context. Their stories often caused intrigue or tension around a situation posed at the beginning of the story and ended with an unexpected twist. They created a hook or an opening statement for intentionally drawing the listener into wondering how the story would unfold and how would it all end. That is to say, the seven elements' scaffolding increased students' storytelling ability in establishing vivid details to reveal feelings and information rather than just saying something was tall, happy, scary, or difficult to do. With regard to this storytelling ability, the story grammar scaffolding were not as effective as the seven elements' scaffolding penetrating the unique filming technique into the creation of digital story. From the perspective of dependency analysis, students' narratives appeared more explicit propositions in the syntactic discourse with the support of *seven elements* in their storytelling process. On the contrary, without such support, students' narratives are remarkable for its lack of redundancy. Therefore, these students tended to stage the order of all events chronologically without elaboration on people, subject, context, or a specific event. Although Peterson and McCabe (1983) emphasized that the level of explicit proposition in the linguistic discourse did not represent the quality of a story, the results from the researcher's dependency analysis manifested that children exhibited their enthusiasm for or strong emotional associations to certain aspects of an experience in their narratives under the effect of the seven elements rule-based scaffolding.

Research Question 3: How providing the instructional scaffoldings influence the coherence of visuals and verbal representations in the digital story produced by second grade students?

As previous research suggested, digital storytelling represents a particularly powerful method of expression that can amplify a writer's voice (Bull and Kajder, 2004; Shelby-Caffey et al., 2014). However, it is not easy to accommodate students' various new literacy abilities in order to make the creation process effective. In this study, students were confident dealing with

the multimodal challenges, such as sequencing the images, narration, and animations in a coherent way that follows the entire storyline. Thus, under the effect of rule-based scaffoldings, they performed surprisingly excellent in the aspect of narrating, audio effects, and visual effects. These geniuses made full use of the Movie Maker storyboards to enrich their story content, and supported the design through a bunch of robust multisensory. In particular, Lambert's seven elements of digital storytelling led students to use voices and colors to create intimacy with the information while making the meaning of the message come alive for audiences. Meanwhile, these students intentionally tried to create a specific mood to engage the audience via varying the duration of images or moving them to the beat of music in ways that flow harmoniously with the message. Therefore, digital storytelling with Lambert's seven elements rule-based scaffolding sparked students' creativity and artistic expressions in ways of merging traditional literacy with new literacy (Shelby-Caffey et al., 2014; Tackvic, 2012). As research (Flaherty and Glantz, 2014; Dalton et al., 2015; Drew, 2012; Richardson, 2012; Robin, 2007) indicated, making visual literacy is a key 21st century skill for today's students to master, the infusing with Lambert's seven elements rule-based scaffolding into the digital storytelling process is particularly powerful in enhancing these young children's new literacy skills.

Research Question 4: Do instructional scaffoldings improve students' narrative knowledge by the end of the study?

Digital storytelling is an effective instructional strategy of empowering students' multimodal composition abilities. Past research has proved that the use of digital storytelling enriched students' multimodal composing or multimodal literacy experiences (Dalton et al., 2015). Ultimately, this effectiveness would affect students' digital authoring experience and therefore their reading and writing abilities were greatly promoted throughout the process of creating a digital story. Simple stated, narrative writing plays an essential role in the process of creating digital stories (Robin, 2008; Sarica & Usluel, 2015). Thus, there is a good reason to

evaluate the effectiveness of this experimental design through examining students' knowledge gain: story comprehension and story writing, after exposure to the digital storytelling process. In this study, with digital storytelling, the majority of students' narrative knowledge (awareness of the story structure and writing skill) were dramatically increased, no matter for scaffold or non-scaffold groups. Despite of the slight increase in the knowledge of story structure for the non-scaffold group, it is confident to say that all students' talents in narrative or descriptive writing were maximally exploited under the impact of the powerful digital storytelling. Besides, when examining students' performances across story content, story coherency and narrative knowledge post-test, the group with two instructional scaffoldings was the most outstanding as compared to other groups (non-scaffolding or story grammar scaffolding).

Implications of This Study

The educational use of digital storytelling emerged as an innovative and efficient instructional strategy in the 21st century classrooms. The results from this study demonstrated how a set of explicit rule-based instructional strategies effectively affected young children's story comprehension, narrative writing skill, storytelling abilities, and new literacy skills prior and after the process. The result is obvious that the provisions of rule-based scaffoldings in the digital storytelling process enhanced students' story structure awareness, visual and verbal communication skills, and creativity. Despite the use of story grammar is a not new idea, the result of this study has proved again the effectiveness of narrative schema in helping students generating well-organized story. On the other hand, the use of seven elements of digital storytelling in the primary grade classroom is a relatively new idea. This idea is promising but uncertain in today's K-12 school settings because seldom of empirical research has tested the effectiveness of seven elements of digital storytelling in the classrooms until this study. The result of this study with respect to the seven elements scaffolding is particularly appealing under

an instructional setting for several reasons. It can provide a way of helping struggling young readers and writers who might not otherwise find an authentic means of expression. It can spark young children's artistic expression in a way of using multimodal channels (visual and verbal). It can motivate teachers who are struggling with teaching new literacy concept for their students. In general, the explicit practical implications of this study were provided in three aspects: the implementation of digital storytelling in classroom, the implementation of story grammar in digital storytelling process, and the implementation of seven elements of digital storytelling. The recommendation for future research was also provided in this section.

The Implementation of Digital Storytelling

Mayer's cognitive theory of multimedia learning demonstrated how multimodal presentation enhanced a student's learning experience. There is enough evidence to support that digital storytelling as a way of making full use of multimodal learning can be an invaluable means of expression. However, adapting this method to the classroom require some thoughts. The researcher has found that the twin constraints of limited class time and limited access to technology were factors in a class setting. Because time available within curricula is limited, in an era of accountability, class time must address specific instructional objectives. A planning sequence for working with 20 to 26 students and a limited number of computers is essential.

The researcher have found that the following sequence of steps works well:

1. Introduce the concept of digital storytelling
2. Introduce and teach how to manipulate the Movie Maker software
3. Brainstorm a story and generate ideas
4. Draft a story and refine it
5. Search relevant digital materials for the story

6. Create a storyboard on Movie Maker
7. Synthesize information (images, audio, video) on Movie Maker
8. Editing and feedback
9. Presentation and evaluation

The first four steps focus on the phase of planning and writing. Therefore, the researcher began with teaching mini lessons throughout the creation of a story based on the provided prompts. Through each of the mini lessons focused on a skill or a strategy that students needed for comprehending the basic knowledge of narrative writing, and how story elements were organized in a coherent way (editing and revising), the lessons were meant to extend learning beyond the immediacy of a focal text. Students actively engaged in each lesson when the researcher acted as a facilitator to promote the learning and teaching environment. The key instructional strategy worked in concert to get students motivated without simply having them write things down or just from listening to the teacher's talk. As the findings of this study indicated, it was important to involve the students in hands-on engagement with both the content and technology. After discussing ideas with the students about how to write a good story and expressing the desire to use the Movie Maker they had received, students should be encouraged to tap into and do hands-on practices on Movie Maker tool. Students' reaction and feedback to a new technological tool is always important when a teacher decides to implement the digital storytelling approach in her classroom.

Step 5 to step 9 focus on the phase of construction. This phase requires students to master the basic operation of Movie Maker tool, start with package their thoughts and display the content in a storyboard where images, sounds, animations, video, music, transitions, and special effects are integrated. It is always not easy for students to synthesize the various genre of communications focused on making their message alive for others. Therefore, teachers need to

be diligent about requiring scripts (story draft) and storyboards as a readiness ticket prior to the construction phase. Story drafts and storyboards ensure that the content is accurate and robust, and also demonstrated that media choices are effective and designed to support the message (Porter, 2006). The most difficult step of this phase is to incorporate the media elements in a story to convey significant meaning, particularly when student with limited experiences in using technology. The researcher had realized that not every student fully devoted his or her time to the content and media effects on the Movie Maker. Students who constantly focused on the Movie and asked technical questions during the construction process performed relatively better on their digital storytelling. Students who were quiet and paid less attention to what the teacher or the researcher said reflected the lack of required skills and competence on their digital storytelling. The research also found it was challenging for one teacher to help all twenty-six students individually. In this case, the researcher suggests that the second grade teacher collaborates with fifth-grade teacher. The older students are trained as listeners and scribes to listen to the stories and help the younger ones write or sequence their stories, and the older students can teach the younger ones how to use technological applications such as Movie Maker, how to incorporate the various features of visual and audio effects in their stories.

Despite of the issue of limited technological resources, from this study the researcher realizes that it is a matter of knowledge and willingness, on the part of students, influence the engagement of technology use in the creation process. Thus, in order to address this issue, it is not only the responsibility of school and administrators to ensure that there is access to affordable technology for every student in the classrooms; teachers also need to support and create classroom environments where students have an opportunity to become technological literate and savvy.

The Implementation of Story Grammar in Digital Storytelling

Past research has proved the effectiveness of story grammar in the development of young children's personal stories. Literature has revealed that this strategy was often applied in the reading and writing instruction. In this study, the purpose of implementing story grammar in digital storytelling is to inform the basic structure of a story or the story plots, and ultimately encourages students to be good story writers or story tellers. Though each of the mini lessons, the students used their story (concept) maps with information clues to guide the story creation process (summarizing, sequencing events, dialogue, how plays are written, story elements, writing a script, discussing with classmates, editing, etc.). Relying on this strategy, the researcher organized students for discussion groups and assigned role accordingly, and they all participated in the process of peer review and peer evaluation on each other's writing. On alternative days, the researcher discussed the story (concept) map to ensure that each student had a firm understanding of the plot. Subsequently students revised or edited their story based on the researcher's comments or feedback. In the meantime, the researcher occasionally emphasized the accuracy of grammar and vocabulary. By the end, this instructional strategy effectively strengthened students' knowledge of story (narrative) writing and storytelling abilities.

The Implementation of Seven Elements in Digital Storytelling

Many practitioner-based literatures shed light on the sequence of seven steps (also known as seven elements) for making effective digital storytelling in k-12 classrooms. This study proved that the implementation of seven elements of digital storytelling worked successfully in promoting second graders' creativity and artistic expression in a digital story. As the findings suggested, the seven elements provided practical guidelines for teachers to teach students how to incorporate technology in artful way demonstrating craftsmanship in communicating with color,

image, sound, text, voice, animations, design and transitions. Within each of mini lessons, the information of seven elements were infused accordingly into students' digital storytelling. The researcher facilitated this process by providing relevant instructional materials (e.g., a list of creative adjective words, some examples of interesting opening statements for the story, and a sample product of student's digital story). With this strategy, teachers find a way to encourage students in writing and storytelling in the English language arts (ELA) classroom. Unlike traditional literacy instruction, this instructional strategy provides a platform for students to communicate with multimodal channels that illuminate the meaning of message: narration, voices, sound and music, via establishing the tone, mood and emotional context. The *seven elements* highlight the key components of a good digital story: unique perspective, a dramatic question, the emotional content, varied pace, the gift of his or her voice, the beauty of sound, and economy. The *seven elements* penetrate the unique filming technique into the creation of digital story: illuminate content in the message through showing, not telling, information. Teachers can adapt this method to tap into students' existing visual, oral, print, textual, and technological literacies in the classroom. Teachers can also adapt this method to help struggling young readers and writers in improving their written and oral communication skills.

Recommendation for Future Research

Digital storytelling is an innovative practice for revitalizing the narrative writing instruction while leveraging and enriching students' digital literacy experiences. It perfectly evolved as a multimodal learning approach to engaging students to critical thinking, critical reading, written communication and artistic expression. However, this approach requires some level of skill in using hardware and software for both students and their teachers. Considering the participants of this study were largely from high socio-economic status families, their technology competency and training at school ensured the successful implementation of this approach for

each step in this study. However, the population from this study does not represent the population in other area. Today, many educators and their schools still face the ongoing challenges of technology accessibility, usage, and equity in the United States, particularly in the low socio-economic, rural areas. While viewing digital storytelling approach as a panacea for English language arts, the researcher strongly believe that the lack of technological resources, technological knowledge and technological preparation results is a challenge for teachers to implement this approach in their classrooms. Limited research has been investigated in various different situations. Therefore, it is worthwhile to investigate the digital storytelling approach associate with the classrooms where are situated with limited access to Internet, computers, and digital tools. Future research can be conducted with samples included students of low socio-economic status, minority groups on the development of rule-based scaffoldings in digital storytelling.

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APPENDIX A: COMMON CORE NARRATIVE RUBRIC

Elk Grove Unified School District – Narrative Rubric, Grade 2

	4 (Above Grade Level)	3 (At Grade Level)	2 (Approaching Grade Level)	1 (Below Grade Level)
Focus/ Setting CCSS*: ➤ W – 3 ➤ W – 4	<ul style="list-style-type: none"> Responds skillfully to all parts of the prompt Establishes a situation in a well-elaborated recount of an event or short series of events 	<ul style="list-style-type: none"> Responds to all parts of the prompt Recounts a well-elaborated event or short sequence of events 	<ul style="list-style-type: none"> Responds to most parts of the prompt Attempts to recount an event or a short sequence of events. Missing information creates confusion. 	<ul style="list-style-type: none"> Responds to some or no parts of the prompt Fails to recount an event or a short series of events
Organization /Plot CCSS: ➤ W – 3	<ul style="list-style-type: none"> Uses temporal words and phrases to signal event order Provides clear closure. 	<ul style="list-style-type: none"> Uses temporal words to signal event order Provides a sense of closure 	<ul style="list-style-type: none"> Limited use of temporal words to signal event order Attempts to provide closure 	<ul style="list-style-type: none"> No use of temporal words or only uses temporal words without events. Does not provide closure
Narrative Techniques CCSS: ➤ W – 3	<ul style="list-style-type: none"> Includes vivid details that describe actions, thoughts, and feelings 	<ul style="list-style-type: none"> Includes details that describe actions, thoughts, and feelings 	<ul style="list-style-type: none"> Includes few or irrelevant details to describe actions, thoughts, and feelings 	<ul style="list-style-type: none"> Insufficient or no details
Language- Conventions of Grammar and Usage CCSS: ➤ L – 1b ➤ L – 1c ➤ L – 1f ➤ L – 1g	<ul style="list-style-type: none"> Uses a variety of adjectives and adverbs strategically Uses a variety of prior and current grade-level pronouns correctly Uses verb tenses and plural nouns correctly, including irregular forms Produces correct simple, compound, and complex sentences 	<ul style="list-style-type: none"> Uses adjectives and adverbs appropriately Uses prior and current grade-level pronouns correctly (e.g., I, me, my, they, them, their, myself) Uses verb tenses and plural nouns correctly, including some irregular forms (e.g., is/was; child/children) Produces correct simple and compound sentences 	<ul style="list-style-type: none"> Uses some simple adjectives and adverbs appropriately Uses prior and current grade-level pronouns correctly some of the time Uses some regular verb tenses and common plural nouns correctly Produces mostly correct and complete sentences 	<ul style="list-style-type: none"> Uses adjectives and adverbs inappropriately or not at all Uses pronouns incorrectly or not at all Uses verb tenses and plural nouns incorrectly Produces mostly incorrect sentences
Language – Conventions of Capitalization, Punctuation, and Spelling CCSS: ➤ L – 2	<ul style="list-style-type: none"> Capitalizes correctly and consistently with no errors: first word in a sentence, “I,” proper nouns, and titles Uses commas, apostrophes, and end punctuation correctly all the time Applies above grade-level spelling rules and patterns correctly, including irregular high-frequency words ; no errors 	<ul style="list-style-type: none"> Capitalizes correctly and consistently with a minor error: first word in a sentence, “I,” proper nouns, and titles Uses commas, apostrophes, and end punctuation correctly most of the time Applies grade-level spelling rules and patterns correctly (reference core sound/spelling resources); few to no errors 	<ul style="list-style-type: none"> Capitalizes correctly and consistently with some errors: first word in a sentence, “I,” proper nouns, and titles Uses commas, apostrophes, and end punctuation correctly some of the time Applies some grade-level spelling rules and patterns correctly; some errors and phonetic spelling interfere with readability 	<ul style="list-style-type: none"> Capitalizes incorrectly with many errors Uses commas, apostrophes, and end punctuation incorrectly or not at all Misapplies grade-level spelling rules through phonetic spelling; excessive errors interfere with readability

*CCSS – Common Core State Standards alignment (“W” = Writing strand; “L” = Language strand)

APPENDIX B: DIGITAL STORYTELLING EVALUATION RUBRIC

Digital Storytelling Rubric Second Grade

Category	Excellent(4)	Good (3)	Satisfactory(2)	Needs Improvement (1)
Vocal Narration	Voice is very clear throughout the presentation.	Voice is clear throughout the presentation	Voice is somewhat clear throughout the presentation.	Voice is not clear throughout the presentation.
	Narration is perfectly coherent with the presented information.	Narration is coherent with the presented information.	Narration is somewhat coherent with the presented information.	Narration is not coherent with the presented information.
Music/sound	Music/sound is very clear throughout the presentation.	Music/sound is clear throughout the presentation.	Music/sound is somewhat clear throughout the presentation.	Music/sound is not clear throughout the presentation.
	Music/sound is perfectly coherent with the presented information.	Music/sound is coherent with the presented information.	Music/sound is somewhat coherent with the presented information.	Music/sound is not coherent with the presented information.
Image	Image is very clear throughout the presentation.	Image is clear throughout the presentation.	Image is somewhat clear throughout the presentation.	Image is not clear throughout the presentation.
	Image is perfectly coherent with vocal narration.	Image is coherent with vocal narration.	Image is somewhat coherent with vocal narration.	Image is not coherent with vocal narration.
Pace	The pace (rhyme and voice punctuation) perfectly fits the storyline.	Occasionally the pace is too fast or too slowly.	The pace does not somewhat fit the storyline.	No attempt to match the pace of storytelling to the audience.
	The pacing is engaging for the audience.	The pacing is relatively engaging for the audience.	Audience is not consistently engaged.	

Rubric categories adapted from the Center for Digital Storytelling's "Seven Elements of Digital Storytelling" as outlined in the Digital Storytelling Cookbook (Lambert,2007)

APPENDIX C: WINDOWS MOVIE MAKER INSTRUCTION SHEET

Accessing Movie Maker

If you have a Windows operating system on your school computers, Movie Maker should be included in the “All Programs” list or in the “Accessories” folder on your machines; otherwise, you will need to download it from:

<http://www.microsoft.com/windowsxp/downloads/updates/moviemaker2.mspx>. Please note that some earlier versions of Movie Maker do not include the ability to use transitions or video effects described below; if you want to use these tools, you should download the most recent version of the software.

Using Movie Maker

Note: If you need to stop and want to come back to your movie later, you must click **Save Project as** and either save it on the computer or a disc. Then when you reopen it, all your images and the timeline will be saved.

1. Open Windows Movie Maker.
2. You will work using the Movie Tasks on the left side of the screen. If this isn't showing, go to the **View** menu and click on **Task Pane**.
3. Under **Capture Video** in the Movie Tasks list, click on **Import Pictures**.
4. Search for your photos (they should either be saved on your computer or on a disk that you insert). Download them into the program. They will show up in the collection screen to the right of the Movie Tasks list.
5. Make sure your Storyboard is showing at the bottom of the page. If it isn't, click on the **View** menu and then on **Storyboard**.
6. Once the storyboard is showing, click and drag photos into the squares.
7. Once you are satisfied with your arrangement, you are ready to try out some effects and transitions.
8. Transitions can be added to a picture by going to the Movie Tasks on the left side of the screen and clicking on **Edit Movie** and then **View Video Transitions**. This move will bring all available transitions onto the screen. In order to try out a transition, simply click and drag it into the space between two photos on the storyboard. To delete a transition, right-click on it in the storyboard and click **Cut**.
9. Effects can be added by clicking on **View Video Effects**. To insert an effect, click and drag the effect onto the photo. When you apply an effect, the star on the photo will turn blue. To delete an effect, right-click on the star and click **Cut**.
10. Previewing effects and transitions in your movie is easy. Simply press **Play** on the movie screen on the right side of the screen. If the screen is not visible, click on the **Play** menu and then **Play Clip**. (Once you play your movie, your storyboard at the bottom may change into a timeline. You can click on **Storyboard** in the View menu to get it back. Once you are satisfied

with all of your effects and transitions, it's time to add text. Click on **Make Titles or Credits** in the Movie Tasks list. This allows you to place text before, on, or after a picture. If you want to add some words to the movie right on the pictures, you can do that. If you want to add the words between, you can choose to place them before or after the picture.

12. If you decide to add narration, first check to ensure your "pages" show long enough to read the text. If not, you can lengthen them on the timeline. When you are satisfied with the length of the images, go to **Tools** and click on **Narrate Timeline**. You need to be in Timeline view to narrate. Using a microphone, have students narrate their stories as the slides progress. Adjust the volume switch and click on **Start Narration**. If you have difficulties, click on **Narrating the Timeline**. The instructions will guide you through the process.

13. When you are satisfied, it's time to create your book! Go to Movie Tasks and **Finish Movie**. If you have a very large file, it's best to click **Save it to my Computer** first. Then once the movie is rendered, you can resave it any way you like. While saving your movie, you can create a large-size copy by simply clicking on **Best fit to file size**. However, these files are very large and won't usually fit into e-mails or open easily on slow computers. Therefore, it's best to click on **Other Settings** and scroll down to **High quality video – small**.

14. Congratulations! You are officially the proud creator of a digital "book"!

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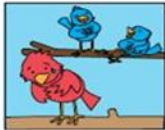
APPENDIX D: NARRATIVE KNOWLEDGE TEST

BE A DETECTIVE

Flying Jelly



These sentences are out of order and the story doesn't make sense!
Number the sentences below to put them in the correct order.



_____ One day, other birds from the tree across the street made fun of the way she flapped her wings, so Jelly stopped flying.



_____ Jelly was flying high and having so much fun with her brothers and sisters that she forgot about the other birds. She learned that you enjoy the things you love more when you stop worrying about what others think.



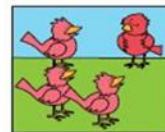
_____ After a few days, Jelly was bored of walking everywhere and did not want to miss out on the fun.



_____ A little red bird named Jelly loved to go flying with her brothers and sisters, but Jelly didn't flap her wings like everyone else.



_____ Despite being embarrassed she started flying again and ignored the older birds who teased her: "Yay! Jelly is flying!" cheered her siblings. "Wow! She can fly higher than older birds can."



_____ "There is nothing wrong with the way you flap your wings!" Her brothers and sisters begged her to fly with them.

Chuck's Vacation

Look at each photograph, and write a caption for each picture.
Each caption should describe what you see in the photograph.









APPENDIX E: STORY MAP



Map it out!

1. Title of my story: _____
2. What is my story about? (summarize the story I will tell at the beginning):

3. Organize my story ideas for the beginning, middle, and end.

Beginning) to introduce the characters, the situation, the place and time when the story happened:

Middle) what happened in my story? (hint: using transition words: first, next, then, finally, etc.)

What is **interesting or important** about my story to my audiences? What strong feelings do I want to show? Why the audiences should keep listening?

End) What is the end of my story?


Write my **closing** sentences (to tell people that my story is over and what is the meaning of my story I want to show?)

APPENDIX F: SEVEN ELEMENTS OF DIGITAL STORYTELLING WORKSHEET

Seven Elements Checklist



Name: _____

Your Teacher: _____

1.		I have a main idea for my story.	
		I used first person "I" throughout my story.	
2.		I have an opening sentence at the beginning to grab the viewer's attention.	
		I have a closing sentence to end my story.	
3.		I used describing words in my story.	
4.		I took out any words or information that I do not need.	
5.		My music makes my story interesting.	
		My music makes sense for my story.	
		My music matches my narration.	
6.		My voice is clear in my story.	
		My voice is fluent in my story.	
7.		I adjusted the length for each image and narration play.	
		I used transition effects in my story.	



APPENDIX G: STORY GRAMMAR CHECKLIST

<div style="border: 1px solid blue; padding: 5px; display: inline-block; margin-bottom: 20px;">Beginning</div> <div style="text-align: center; margin: 20px 0;">  </div>	I have a title for my story.	
	I introduced what my story is about at the beginning.	
	I described the setting (where, when).	
	I introduced the character (who).	
	I explained the situation .	
<div style="border: 1px solid blue; padding: 5px; display: inline-block; margin-bottom: 20px;">Middle</div> <div style="text-align: center; margin: 20px 0;">  </div>	I described what happened in my story.	
	I described what is interesting or important about my story to my audiences.	
	I used transition words that show time and order (first, next, then,finally)	
	I explained how the story ends .	
<div style="border: 1px solid blue; padding: 5px; display: inline-block;">End</div>	I added a closing sentence or reflection sentence at the end.	

APPENDIX H: EDITING CHECKLIST

Digital Storytelling Project_2016 Fall_ Second Grade

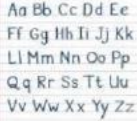







Name: _____

Date: _____

Teacher: _____


Second Grade Editing Checklist


Check your writing! Look for these things:

	I put capital letters at the beginning of my sentences, proper nouns, and titles.	 
	I used correct punctuation marks at the end of all my sentences.	 
	I used best guess spelling and the word wall to spell words correctly.	 
	I remembered to indent my paragraph.	 

Read it again and ask yourself these questions:

☐ Did you write all of your letters the correct direction and size? 

☐ I spaced my words so that others can easily read my writing. 

☐ Does it make sense to you? Does it make sense to someone else? 

APPENDIX I: NETWORK TO RECENT LITERATURE ON DIGITAL STORYTELLING



APPENDIX J: STUDENTS' STORY WRITING PROMPTS

17 Narrative Writing Prompts

Select a topic and write a story about it.

1. Write a story about the most exciting summer you ever had. What did you do?
2. Write about your best birthday ever. What did you do?
3. Write about your most prized possession. Why do you value the object?
4. Write about a time when you were the center of attention. What happened?
5. Write about a time when it stormed really hard. How did you feel?
6. Write a story about a memory that you'll never forget. Why does this experience mean so much to you?
7. Write about a time when you got hurt playing outside. What happened?
8. Write a story about a scary dream you had. What happened in your dream?
9. Write about the best vacation you ever took. What did you do?
10. Write about a time when your parents surprised you with a special reward for doing something good. What happened?
11. Write a story about your teacher. What is his or her best quality?
12. Write about your favorite holiday memory. What do you remember most clearly?
13. Write about the first time you got to do something that was only for "big kids."
What did you get to do?
14. Write about one of your siblings or cousins. What is he or she like?
15. Write a story about a time when you went to the grocery store. What happened?
16. Write about a time when you felt like the luckiest kid in the world. What made you feel this way?
17. Write a story about a time when you received an amazing gift. How did you feel when you opened the present?

So, which one do you choose? Please write the

_____

Well done!!! 😊

APPENDIX K: THE DISPLAY OF ONE STUDENT'S STORY MAP IN THE EXPERIMENTAL GROUP 1.

Map it out!

1. Title of my story: How I Scraped My Knee

2. What is my story about? (summarize the story I will tell at the beginning):

It's about an bike accident

3. Organize my story ideas for the beginning, middle, and end.

Beginning) to introduce the characters, the situation, the place and time when the story happened:

Mom, Dad, my brother. I scraped my knee
The dead end in my neighborhood.

Middle) what happened in my story? (hint: using transition words: first, next, then, finally, etc.)

first My family was riding at the back of my neighborhood.

next I was making these beautiful sharp turns on my bike.

finally All of a sudden I crashed and started wailing.

What is interesting or important of my story to my audiences? What strong feelings do I want to show? Why the audiences should keep listening?

My accident is interesting. How much pain I want to show. The audience will want to see how it ends.

End What is the end of my story?

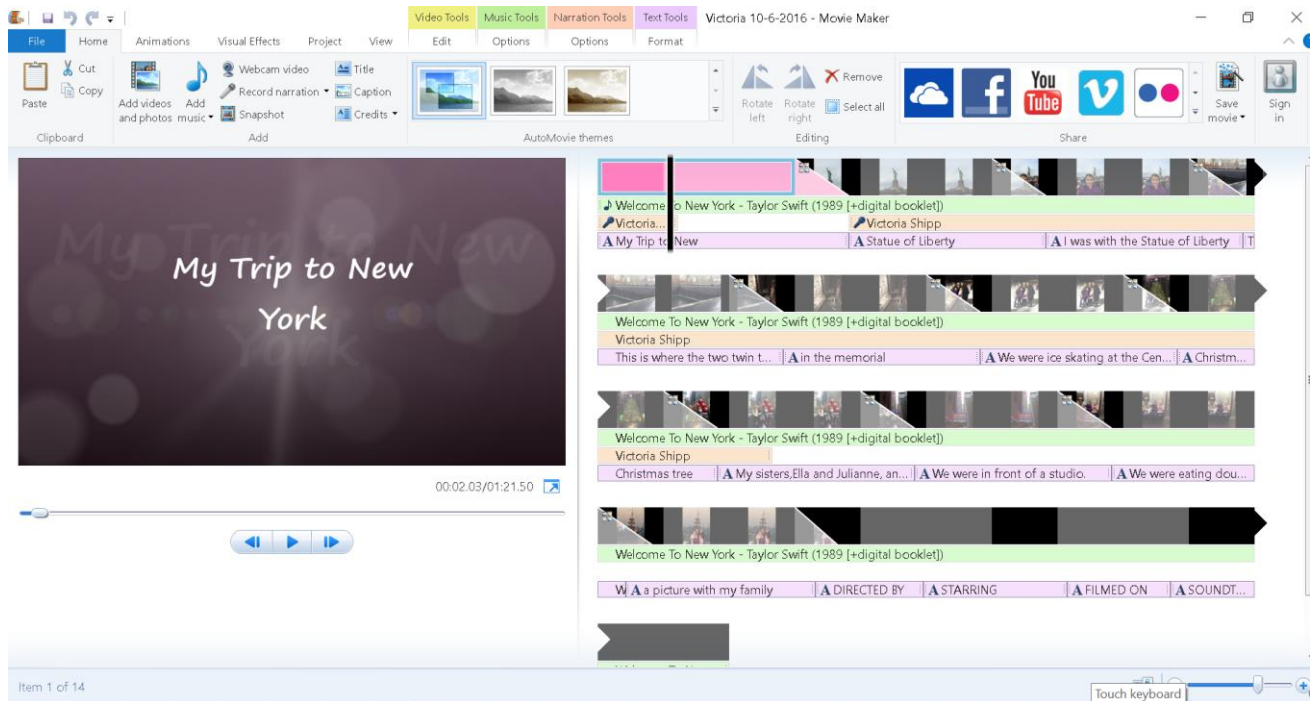
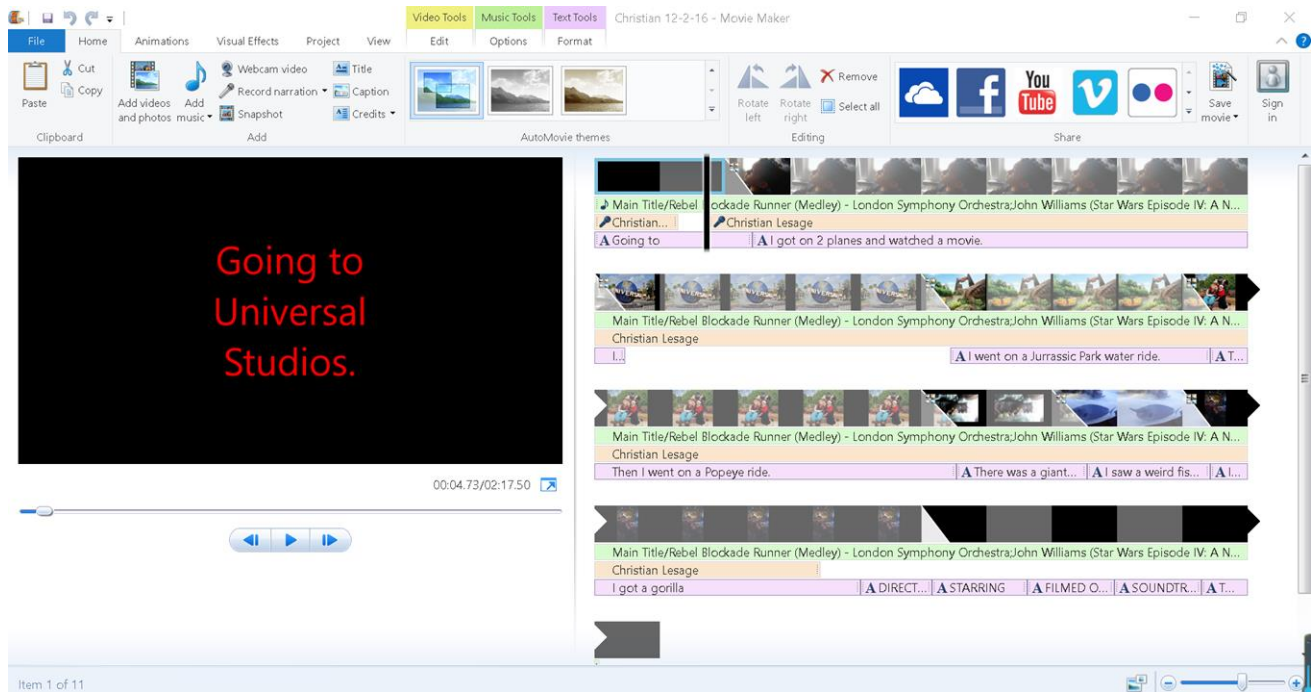
After that the next day was my school carnival! So I was so disappointed.

4. Write my closing sentences (to tell people that my story is over and what is the meaning of my story I want to show?)

Now I know not to make any more sharp turns because there's always a chance I could fall.

Well done!!!! 😊

APPENDIX L: STUDENTS' DIGITAL STORY BOARD



APPENDIX M: IRB APPROVAL DOCUMENTS

ACTION ON EXEMPTION APPROVAL REQUEST



TO: Xue Wen
Educational Research

FROM: Dennis Landin
Chair, Institutional Review Board

Institutional Review Board
Dr. Dennis Landin, Chair
130 David Boyd Hall
Baton Rouge, LA 70803
P: 225.578.8692
F: 225.578.5983
irb@lsu.edu | lsu.edu/irb

DATE: August 1, 2016

RE: IRB# E9994

TITLE: The effect of rule-based scaffoldings on elementary school students' digital storytelling

New Protocol/Modification/Continuation: New Protocol

Review Date: 7/29/2016

Approved X Disapproved _____

Approval Date: 7/31/2016 Approval Expiration Date: 7/30/2019

Exemption Category/Paragraph: 1

Signed Consent Waived?: No

Re-review frequency: (three years unless otherwise stated)

LSU Proposal Number (if applicable):

Protocol Matches Scope of Work in Grant proposal: (if applicable)

By: Dennis Landin, Chairman 

PRINCIPAL INVESTIGATOR: PLEASE READ THE FOLLOWING –
Continuing approval is **CONDITIONAL** on:

1. Adherence to the approved protocol, familiarity with, and adherence to the ethical standards of the Belmont Report, and LSU's Assurance of Compliance with DHHS regulations for the protection of human subjects*
2. Prior approval of a change in protocol, including revision of the consent documents or an increase in the number of subjects over that approved.
3. Obtaining renewed approval (or submittal of a termination report), prior to the approval expiration date, upon request by the IRB office (irrespective of when the project actually begins); notification of project termination.
4. Retention of documentation of informed consent and study records for at least 3 years after the study ends.
5. Continuing attention to the physical and psychological well-being and informed consent of the individual participants, including notification of new information that might affect consent.
6. A prompt report to the IRB of any adverse event affecting a participant potentially arising from the study.
7. Notification of the IRB of a serious compliance failure.
8. **SPECIAL NOTE: When emailing more than one recipient, make sure you use bcc. Approvals will automatically be closed by the IRB on the expiration date unless the PI requests a continuation.**

*All investigators and support staff have access to copies of the Belmont Report, LSU's Assurance with DHHS, DHHS (45 CFR 46) and FDA regulations governing use of human subjects, and other relevant documents in print in this office or on our World Wide Web site at <http://www.lsu.edu/irb>

School Administrator Consent Form

Project Title: The Effect of Rule-Based Scaffoldings on Elementary School Students' Digital Storytelling

Performance Site: Louisiana State University Laboratory School-Elementary School

Investigators: The following investigator is available for questions,

M-F, 8:00 a.m.-4:30 p.m.

Xue Wen

Educational Research Department, LSU

225-252-4498

Xwen12@lsu.edu

Kim S MacGregor

Associate Professor

Educational Research Department, LSU

(225) 578-2150

smacgre@lsu.edu

Purpose of the Study: The purpose of this study is to examine the effect of Joe Lambert's seven elements of digital storytelling as rule-based scaffoldings on digital stories developed by students in second grade classrooms in the fall semester, 2016.

Description of the Study: Over a period of two months, 2-3 days per week, second grade students will participate in the digital storytelling activities. Classrooms will be randomly divided into two groups, control and experiment. The investigator and their teachers will guide and help all participants in the process of digital story creation. They will use the Microsoft Movie Maker to create and edit their personal stories. The experiment group will use rule-based scaffoldings when create their storyboards; while the control group will create their storyboard without any scaffoldings. Their final products will be demonstrated in the class by the end of the study. The investigator will focus on analyze students' artifacts (story content, story structure, and final presentation).

Benefits: There are no direct personal benefits for participants.

Risks: There are no known risks.

Right to Refuse: Participation is voluntary, and a child will become part of the study only if both child and parent agree to the child's participation. At any time, either the subject may withdraw

from the study or the subject's parent may withdraw the subject from the study without penalty or loss of any benefit to which they might otherwise be entitled.

Privacy: The school records of participants in this study may be reviewed by investigators. Results of the study may be published, but no names or identifying information will be included for publication. Subject identity will remain confidential unless disclosure is required by law.

Financial Information: There is no cost for participation in the study, nor is there any compensation to the subjects for participation.

Signature:

School Administrator's Signature: Wade Smith

Date: Aug 3 - 2016



VITA

Xue Wen, a current graduate assistant in the department of Educational Leadership and Research, Louisiana State University. She received her Bachelor's degree at Sichuan University in China in 2010. With family's strong support, she began her journey for pursuing higher level education since 2011. She received her Master's degree in the field of educational technology at Louisiana State University in 2012. Then she decided to pursue a dual degree in the field of applied statistics while she was in the doctoral program of educational research. Her primary research interests focus on exploring the impact of advanced technology on students' academic engagement, motivation, and learning performances in K-12 classrooms.