# Understanding the Digital Storytelling Process for Museum Exhibition through Content Analysis

**Hafizah Rosli[1], Norfadilah Kamaruddin[2], Ira Wirasari[3], Badrul Isa[4]**

[1] Department of Creative Content Technology, Digital and Imaging Arts, Universiti Teknologi MARA, College of Creative Arts, UiTM Puncak Perdana, Malaysia, [2] Department of Creative Photomedia, Digital and Imaging Arts, Universiti Teknologi MARA, College of Creative Arts, UiTM Puncak Alam, Malaysia, [3] School of Creative Industries, Telkom University, Bandung, 40257, Indonesia, [4] Faculty of Education, Universiti Teknologi MARA, UiTM Puncak Alam, Malaysia

hafizahrosli@uitm.edu.my, norfadilah@uitm.edu.my, irawirasari@telkomuniversity.ac.id, badru010@uitm.edu.my,
Tel: +60192416224

## Abstract

This research aims to identify, through various experts and scholars, of established digital storytelling process. The museum's environment has seen a substantial shift. Technology has allowed new engagement, visitor expectations have increased, rivalry for time and resources has risen, and buildings now serve more complex functions. There is no sign of a digital storytelling guideline for curators in Malaysia, even though digital storytelling has begun to emerge. Using content analysis, qualitative research methodology was employed. This finding establishes four primary processes and eight subprocesses for digital storytelling among experts and scholars.

Keywords: digital storytelling; process; museum exhibition; curator


DOI: https://doi.org/10.21834/aje-bs.v7i23.415

## 1.0 Introduction

Due to the rise of digitalisation, museum exhibition technology has undergone some significant changes. Several innovative ways to present interactive museum exhibits allow visitors to tailor their experience. Interactive digital exhibitions have become common at many museums, offering us a memorable experience (Kamaruddin et al., 2022). In partnership with Joe Lambert, the late Dana Atchley, known as the digital story pioneer, brought the shift from traditional storytelling to digital storytelling, also known as DST. This was accomplished by integrating multimedia technology into the traditional story (Carolyn Handler Miller, 2019). The narrative is presented in a way that is both effective and memorable by combining text, visuals or sketches, and audio, such as musical instruments. This method aims to promote abilities in communication, teamwork, and creativity (Carolyn Handler Miller, 2019; Lambert & Hessler, 2018). As a result, it is the curator's responsibility to improve the visitors' experience through the use of applications for digital storytelling. This is because the visitors can explore the virtual exhibition through the artefacts while guided by digital stories. Rizvic et al. (2020).

In addition, introducing digital storytelling (DST) in museum exhibitions will simplify the process of creating digital storytelling for a low-cost budget on museum resources. This will be made possible by the advent of digital storytelling (Negrini & Di Blas, 2015). In the world of museums, a technique known as digital storytelling is used, either in the form of instructional media as the courseware or as a presentation. Storytelling can redefine our connection with cultural heritage, and it is widely recognised as an important component in attracting the most discerning audience to museums and other cultural heritage institutions (Bedford, 2001; Fisher et al., 2008; Pujol et al., 2013). Also, it is a user-centred strategy in cultural heritage institutions such as museums (Pujol et al., 2013). Furthermore, this research provides a unified digital storytelling guideline for the museum exhibition design development. Through various experts and scholars, this study aims to identify established digital storytelling processes on the most fundamental by recognised industry professionals and academic researchers. In the following part, some background information on digital storytelling and the benefits of using it when generating digital multimedia content will be presented.

## 2.0 Literature Review

Traditional forms of storytelling can be revitalised with the help of new tools made available by digital storytelling, which integrates elements such as multimedia, user interaction, and the world wide web into conventional narrative techniques (Anna Parola et al., 2022). It is a strategy for narrative research that overcomes the limits of conventional research and information-gathering methods (La Rose et al., 2021). Exhibitions that can attract attention and look attractive can be an effective way of educating the audiences about local culture. With a knowledgeable populace who respects minority cultures, there will be a high possibility of decreased culture loss (Abdul Wahid & Mat Isa, 2022). This method conveys informative and engaging content regarding various subjects (Porter, 2004). The digital

narrative must be presented engagingly and use multimedia components, such as narrative-generated videos that include images, music, sounds, and animations (Lambert & Hessler, 2018).

Due to this wide range of perspectives held by professionals in the field of digital storytelling, numerous types of narratives have been developed. To be more specific, digital storytelling can be broken down into three categories, each of which is determined by the type of story being told: i) personal narratives; (ii) historical events; and (iii) stories whose primary purpose is to educate or enlighten (Abdel-Hack & Hamid Ahmed Helwa, 2014; Robin, 2008). Because it involves the production of multimedia educational resources, this study focuses on the narrative as a means to inform or instruct through stories.

The use of digital storytelling as a single-user experience for cultural heritage confirms the strength of this method to stimulate engagement, learning, and deeper contemplation. This holds even for visitors with limited interest in particular periods and themes (Dimitra Petousi et al., 2022). Implementing multimedia technology within the museum makes it possible for visitors to connect with the collections in personally important ways, improving their visitor's interest in the things on display (Fisher et al., 2008). The users will be able to learn about the context of the exhibited things and be entertained while encouraging them to investigate those objects more. They are attainable by putting into action a creative approach during the process of producing multimedia content as a means of accomplishing the goal. In general, the process of producing multimedia content can be broken down into three distinct stages: pre-production, production, and post-production.

On the other hand, J. Ohler (2013) asserted that the digital storytelling processes consist of four main stages pre-production, production, post-production and distribution. Except for the differences in the description, most of the actions in each phase of creating multimedia content are analogous to digital storytelling techniques. The experts present several sets of techniques that need to be followed for the curators or the designers to produce an engaging digital story. Nevertheless, to direct them in the right direction, the specialists recommend various procedures, some of which are duplicated.

Throughout the process of digital storytelling, there are numerous sets of processes that digital storytelling experts developed. The phase of distribution is involved in the majority of digital storytelling processes since the development of the story is intended to both reflect and share stories (Carolyn Handler Miller, 2019; Lambert & Hessler, 2018; Ohler, 2013; Porter, 2004; Publishing et al., 2011; Robin, 2008). In turn, some professionals have maintained the traditional digital storytelling workflow, which consists of three stages: pre-production, production, and post-production (Hussain Hashiroh et al., 2016). These stages include activities such as developing story concepts and scripts, gathering media resources and importing and editing media files that contain voiceovers, audio, and still images (Adams et al., 2008; Meadows, 2003; Midge Frazel, 2010). In addition, Hartley and McWilliam's (2009) research on Sara Kajder and the team steps includes the following: i) planning and setting up ii) Drafting the first version of the script. iii) Create a storyboard to accompany it; iv) discuss and modify the script; sequence the images in the video-editing software; add the narrative track; add the special effects; and add the music; v) post-

production and distribution. Few industry professionals consider the production of storyboards to be a crucial stage, even if the process of making storyboards involves the illustration of a narrative (Carolyn Handler Miller, 2019; Hartley & Mcwilliam, 2009; Ohler, 2013). Ohler (2013), on the other hand, provided more in-depth phases, which included the integration of media and communication, as well as the planning phase and technical considerations. As a result, this study suggests a thorough process by combining the many technological components with the narration material so that designers can follow it. Experts in the field of digital storytelling can have divergent points of view, which can result in a unified guideline for the digital storytelling process.

## 3.0 Methodology

In proposing the desired process, this research is implemented in qualitative text analysis using computer assistance MAXQDA, the qualitative research tool software, in six phases. According to (the United States Government Accountability Office Participant Manual Content Analysis: Principles and Practices, 2013), content analysis entails a systematic reading of a body of texts, images, and symbolic matter that is not necessarily from an author or user's perspective only (Ahmad & Mohd Tajuddin, 2022). Various analytic strategies are employed to categorise, compare, and contrast data collection. Systematically coding the data identifies key trends and themes. In order to ensure essential validity and reliability, the categorisation steps will be carried out using necessary documentation from the previously established literature. The data can be generalised beyond direct data. Inter-rater reliability is the extent of agreement between two or more raters, such as observers, coders, or examiners. The steps involved in content analysis are i) identifying data sources, ii) developing categories, iii) coding data, iv) assessing reliability, and v) analysing results. The MAXQDA data analysis software will adapt the Figure 1.0 workflow process to this study.

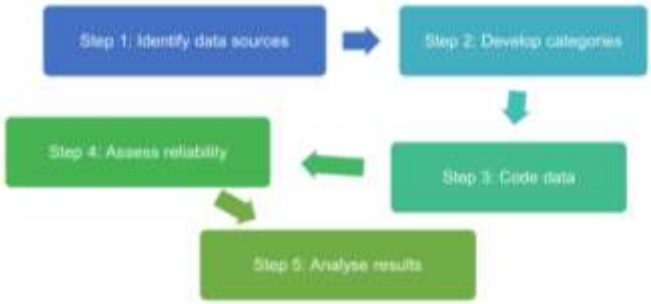



Figure 1: Content analysis process by the (United States Government Accountability Office Participant Manual Content Analysis: Principles and Practices, 2013)

The beginning of the procedure is to identify the data sources. Considering the study topics at hand, this approach will identify appropriate data sources. Furthermore, to consider where the information came from and how it was presented, the researcher should also evaluate its correctness and dependability. The next phase in this research study is to define the units of analysis and items to be coded based on the literature document. Also, selecting materials to be analysed, such as the sample and the universe, is another step that must be completed in this research study. Developing categories is the second stage of content analysis, which is often the most time-consuming and most likely the most significant step. No matter what method or tools are utilised for content analysis, in this case, the MAXQDA data software package, the same amount of effort is required to complete the task. Throughout the process of this investigation, scholarly literature was utilised as a complement to a discussion with a scholar who possesses extensive knowledge concerning the topics at hand. The development of categories requires multiple rounds of iteration, and frequently, a large number of people are involved in this process. Category development also requires iteration. This is because of the requirement for inter-rater reliability; you must ensure that the categories are appropriate and applicable to the researchable topics and that more than one person, a professional academician, would agree on the categories and their meanings. The need for inter-rater reliability is the reason for this. A working paper that includes precise definitions of codes and any preliminary disagreement between coders should be developed after a trial phase on a subset of the data to define the coding categories and before the beginning of the full coding. The trial phase for defining the coding categories should occur before the beginning of the full coding. The process continues with refining the categories, creating inclusion and exclusion criteria, and describing what should be included and what should not be included where there is confusion. This is done to ensure that the correctness of the coding is maintained.

Coding the data is the third step that needs to be completed. Each coder reads each item and places it into one or more categories, depending on the coding method that is being used. While coding the data, you must decide whether the items should be assigned to single or several categories. This decision should be based on an initial inspection of the data and the results of coding tests. It is planned to begin using coloured highlighting on the data in order to differentiate between the numerous meaning pieces contained within the source material or transcripts. After finishing this step, the text that has yet to be marked typically continues to be displayed. The researcher is next tasked with planning whether to incorporate the unlabelled text. If the unmarked text provides information pertinent to the study's subject, then it should be analysed; if it does not, then it should be ignored (Burnard, 1995). The data categorisation procedure will be included in this stage of the data coding process.

The strategy identifies several themes as well as classifications. The individual items' meanings were the basis for establishing and organising the subcategories. This is the approach that will be taken in order to bring together various subjects. The fourth stage, which consists of doing checks of reliability, is meant to guarantee that the categorisation process is both objective and dependable. Even though reliability was taken into account

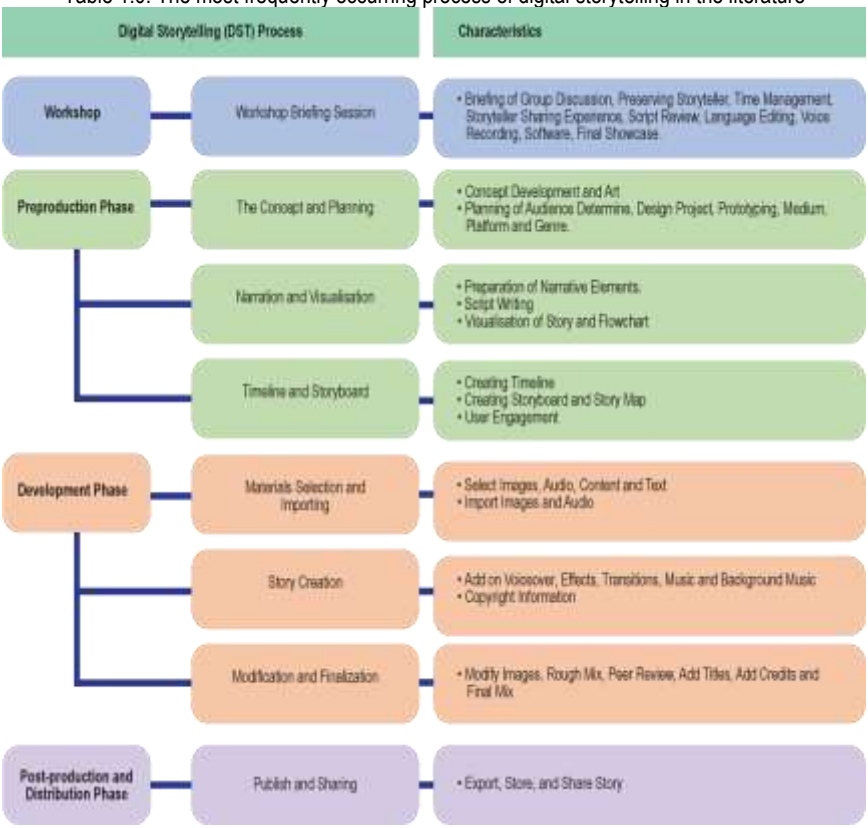
during the categorisation and refinement of categories in the first phase, the total reliability needs to be evaluated so that it can be determined how frequently coders agree. Because of the initial attention, the level of reliability between raters ought to be rather high. The subsequent evaluation of inter-rater reliability will evaluate the degree to which coders agreed on placing items into categories. This evaluation will also be used to highlight disagreements that will need to be resolved.

Depending on the coding scheme you use, there are various ways to condense the findings of a content analysis into relevant information. Even though there is a significant amount more to content analysis than simply counting things, it can be helpful to note the number of items or the percentage of items that fall into each category as you analyse developing themes. Noting the frequency, number, or percentage of items in this research study that have correlated replies, for example, is one way to interpret the findings (for example, the elements or processes that had the same or similar features). Some of the categories in this study could be combined due to the similarities between various topics. If there are several categories, you might decide to "roll up" the categories into broader categories that include a number of subcategories, each individually. A meaning item is the smallest unit that can include a portion of the researcher's insights, as Graneheim and Lundman (2004) and Woods and Catanzaro (1988) have explained. It is a collection of sentences or paragraphs with aspects associated with one another and can be combined to address the purpose. The level of depth at which the data is given on the findings must correspond to the researchable issues.

## 4.0 Finding and Discussion

The process list was then categorised into keywords based on numerous processes established by different experts and scholars. For instance, the digital storytelling process suggested by Lambert and Hessler (2018) serves the same meaning as emphasised by (Ohler, 2013; Robin, 2008). Thus, a common keyword that was widely used and identified has been applied to encompass both terms. A content analysis of six works of literature on digital storytelling and the representation of each expert and scholar has established the digital storytelling process. Producing digital storytelling has resulted in various perspectives from experts and has led to various forms of stories. All the perspectives generated by a digital storytelling process were categorised using the MAXQDA data analysis software. The outcome of the data analysis was discovered to be six out of fourteen expert viewpoints about the process, as shown in Table 1.0.

Table 1.0: The most frequently occurring process of digital storytelling in the literature




### 4.1 Workshop Phase of Digital Storytelling Process

In the content analysis throughout the literature, the 'workshop phase' was the most frequently occurring and most cited as an important process in planning effective digital storytelling. Lambert and Hessler (2018) mentioned that the 'classic' model promoted by the Center for Digital Storytelling in Berkeley, California (CDS) consists of a facilitator-led workshop, usually over three days. It starts with the 'introduction' process as a briefing platform for participants or video creators to understand the entire digital storytelling process. It continues to the 'story circle' when participants can find their stories, share them, and develop them. Furthermore, along with other participants in a safe space, producing, with the help of one or more facilitators, a two or three-minute audio-visual story using readily available rather than professional media software. The 'story circle' aims to enable the group to get to know one another and build trust. Besides that, create a relaxed, trusting atmosphere through storytelling exercises to give people the confidence to tell their own stories and give people the tools to turn their personal stories into a script. It has been

emphasised that processes such as development, story planning phase, planning and setup and define, collect and decide had similar characteristics as starting a digital story from the author's life that serves as the basis for a captivating story question; it defines the story question and shapes the narrative (Carolyn Handler Miller, 2019; Hartley & Mcwilliam, 2009; Ohler, 2013; Robin, 2008). It is established that the process of 'workshop' is the most cited by scholars and considered important as it contributes towards the overall digital storytelling familiarity in experiencing multimedia content.

### 4.2 Pre-production Phase of Digital Storytelling Process

The process of 'pre-production', like some text, is the second most frequently occurring in most digital storytelling steps. This process defines their audience and determines the final product, such as video or podcast, and how it will be presented in class, multimedia content, or posted to the web. They organise preliminary materials and plan for the digital storytelling project. This process was similar to a scholar's, such as planning and setup, planning storyboard, discussion, and revising the script (Hartley & Mcwilliam, 2009; Midge Frazel, 2010) mentioned the preparation stage. Ohler (2013) had the same characteristics in the story planning and pre-production phase, and (Robin, 2008) defined, collected, and decision process. Almost all the six scholars ascertain the process of 'pre-production' in a different term with similar steps. As Midge Frazel (2010) suggests, during the preparation stage, the development and processes of good writing should be highlighted and addressed in any event, as this process will inform the storyboard's development. Hartley and Mcwilliam (2009) and Ohler (2013) also supported the previous statement who wrote an initial script highlighting the story development process and finalisation. Overall, the pre-production process contributed significantly towards the flow of importance or focus of the story development process as a good storyline.

### 4.3 Development Phase of Digital Storytelling Process

The third most frequently occurring process is the development phase. This phase of the work is also known as the pre-production period (Ohler, 2013). The tasks during the development period are producing design documents, artwork, and other materials, building a prototype, and doing testing. Not every task conducted throughout this period is related explicitly to creative issues. However, everything, including the preparation of budgets and schedules and the development of marketing plans, usually impacts the content (Carolyn Handler Miller, 2019). The process has similarities to Hartley and Mcwilliam (2009) through sequences of images by video editing, adding on narrative tracks, special effects, and music. Midge Frazel (2010) suggests it occurs during the 'production phase,' when all the story's media elements are combined and rendered into a video format (movie) or an audio format such as a podcast. Robin (2008) categorises it into two sections. The first section is to decide, write, record, and finalise. The second section is the select, import, and create. Concisely, most scholars and experts mentioned the same characteristics: the lengthy digital storytelling process (DST) process.

### 4.4 Post-Production and Distribution Phase of the Digital Storytelling Process

The fourth most frequently occurring process is the post-production and distribution phase. This process is all about presentation. The digital story should be saved onto a file-sharing site or archived onto a CD or DVD. The digital story is played in the classroom or posted on the web. According to all the texts identified by Hartley and Mcwilliam (2009), Lambert and Hessler (2018), Midge Frazel (2010), Ohler (2013), and Robin (2008), they had similarities in this process. All the scholars and experts mentioned that the post-production and distribution phase shows the digital story to peers to get feedback about how the story could be improved. Sharing digital stories through websites that allow users to upload files and create presentations online is one of the ways of distribution. However, the distribution phase is the difference in the digital storytelling (DST) process among experts. In this phase, audiences are allowed to improve and edit the story. Most scholars and experts had the same perspective on post-production and distribution.

### 4.5 Finalise List of Digital Storytelling Process

According to the data in Table 1.0, there are four stages to digital storytelling: the workshop, the pre-production, the development, and the post-production and distribution stages. It consists of four primary digital storytelling processes, each containing a subprocess from the main processes, which have been classified according to the theme of the process. It began with the workshop process and progressed to the pre-production phase, with a total of nineteen steps of the process that a curator must go through. Seventeen steps of the development process must be completed before moving on to the post-production and distribution phase. Due to the lengthy list of steps, the digital storytelling method needed to be more detailed and easier to follow.

A combination of the specific processes that had been done from the finalised list of the digital storytelling processes and characteristics that were advised by the relevant body of literature had been completed. The four primary procedures have remained the same. However, the secondary procedures have been condensed and simplified because of an analysis of lists, including procedures that are analogous to those of the primary procedures. It starts with the initial procedure, which is called the "workshop briefing session." It then moves on to the second process, the "pre-production phase." This phase includes three sub-process summaries that cover the preceding nineteen subprocesses. The three subsidiary processes are the following: I, the concept and planning stage; ii) the narration and visualisation stage; and iii) the timeline and storyboard stage. This part of the process continues from the previous seventeen stages, which have been condensed into three more steps: I, the selection and importation of materials; ii) the construction of a story; and iii) the modification and finalisation of the story. The method proceeds from the seventeen steps condensed into three to the development phase. Finally, the post-production and distribution steps were broken down into two distinct stages: publishing and sharing. Everything had been documented in excruciating detail, and the characteristics served as a roadmap for the key procedures. The complete version of the blueprint for the digital storytelling process. It is important to note that digital technologies boost curators'

capacity to create digital content that would benefit educational purposes, allowing visitors better to grasp the various aspects of culture and heritage.

## 5.0 Conclusion

The findings from the research have shown that the digital storytelling process consists of eight basic processes that can be broken down into four main processes phase. The development of digital storytelling begins with the important element of articulating the concepts that underlie a narrative. So, it is the responsibility of the curators and designers to provide concepts that will lead to the production of a narrative. The digital storytelling process includes a few processes that, when followed, will direct curators and designers in producing any multimedia content. The distribution phase is where the digital storytelling process diverges from other existing multimedia workflows, which is the main distinction between the two. The audience can contribute to the plot at this point in the performance. In addition, the study emphasises narrative, visualisation, and storyboards because it is critical to visualise the tale's flow. This discovery helps redefine the process of digital storytelling in accordance with various areas of skill and experience in producing multimedia materials and applying digital technology. This study is restricted to concentrating solely on the procedures involved in digital storytelling for museums rather than on the technologies themselves. However, the procedures can be modified in various contexts that intend to use digital storytelling. As a result, more research may be done to locate appropriate technologies that could improve presentations for digital storytelling. In addition, it is possible to recommend it to all participants in the story production process, whether using an interactive or non-interactive platform in the museum exhibition. As a result, the method is also useful as a guide for curators and designers, particularly those who need to become more experienced with digital storytelling. When producing a museum exhibition that uses digital storytelling, curators and designers can utilise a detailed guideline as a reference point for additional research.

## Acknowledgement

This research is supported by the GERAN PENYELIDIKAN KHAS (GPK) 600-RMC/GPK 5/3 (219/2020). The author wishes to thank ReNeU UiTM and ILD UiTM for facilitating the writing and publication workshop.

## Article Contribution to Related Field of Study

This research contribution is on the method of digital storytelling that is appropriate for museum exhibitions and derives from the opinions of experts and scholars. The methodology that was utilised has the potential to be adapted for use in various samples for research in other fields.

## References

Abdel-Hack, E. M., & Ahmed Helwa, H. S. A.-H. (2014). Using digital storytelling and weblogs instruction to enhance EFL narrative writing and critical thinking skills among EFL majors at the faculty of education. Educational Research Journal, 5(1). https://doi.org/10.14303/er.2014.011

Abdul Wahid, W., & Mat Isa, M. J. (2022). Museum as a Laboratory of Knowledge towards Local Culture Empowerment. Environment-Behaviour Proceedings Journal, 7(SI7), 275–281. https://doi.org/10.21834/ebpj.v7isi7.3793

Adams, G., Davies, H., Evans, C., Heledd, L., Jones, L., Lewis, K., Meadows, D., Morlais, G., & Turner, S. (2008). A Guide to Digital Storytelling by members of the BBC Capture Wales / Cipolwg ar Gymru team A Guide to Digital Storytelling by members of the BBC Capture Wales. https://www.bbc.co.uk/wales/audiovideo/sites/yourvideo/pdf/aguidetodigitalstorytelling-bbc.pdf

Ahmad, H., & Mohd Tajuddin, R. (2022). A Content Analysis of Malay Clothing in Malaysia. Environment-Behaviour Proceedings Journal, 7(SI7), 529–541. https://doi.org/10.21834/ebpj.v7isi7.3827

Bedford, L. (2001). Storytelling: The Real Work of Museums. Curator: The Museum Journal, 44(1), 27–34. https://doi.org/10.1111/j.2151-6952.2001.tb00027.x

Fisher, M., Twiss-Garrity, B. A., & Sastre, A. (2008). The Art of Storytelling: Enriching Art Museum Exhibits and Education through Visitor Narratives. Museums and the Web 2008: Proceedings, Toronto: Archives & Museum Informatics. https://www.archimuse.com/mw2008/papers/fisher/fisher.html

Hartley, J., Mcwilliam, K., & Kajder, S. (2009). Story circle: digital storytelling around the world. Wiley-Blackwell.
Hussain, H., & Shiratuddin, N. (2016). The digital storytelling process: A comparative analysis from various experts. AIP Conference Proceedings, 1761(1). https://doi.org/10.1063/1.4960884

Kamaruddin, N., Ibaruslan, N., Rosli, H., & Marman, M. (2022). Interface Design Review on Interactive Exhibition for Nagasaki Atomic Bomb Museum. Environment-Behaviour Proceedings Journal, 7(SI7), 235–240. https://doi.org/10.21834/ebpj.v7isi7.3788

La Rose, T., & Detlor, B. (2021). Social Work Digital Storytelling Project: Digital Literacy, Digital Storytelling, and the Makerspace. Research on Social Work Practice, 104973152199242. https://doi.org/10.1177/1049731521992427

Lambert, J., & Hessler, B. (2018). Digital storytelling: capturing lives, creating community. Routledge.
Meadows, D. (2008). A Guide to Digital Storytelling. https://www.bbc.co.uk/wales/audiovideo/sites/yourvideo/pdf/aguidetodigitalstorytelling-bbc.pdf

Midge Frazel. (2010). Digital storytelling: guide for educators. Hawker Brownlow Education.

Miller, C. H. (2019). Digital storytelling: a creator's guide to interactive entertainment. CRC Press.

Negrini, M., & Di Blas, N. (2015). Digital Storytelling for Cultural Heritage: A Modular, Multi-channel, Multi-scenario Approach. In Built Heritage: Monitoring Conservation Management (pp. 367–375). Springer.
Ohler, J. (2013). Digital storytelling in the classroom: new media pathways to literacy, learning, and creativity. Corwin, A Sage Company.

Petousi, D., Katifori, A., Servi, K., Roussou, M., & Ioannidis, Y. (2022). History education done different: A collaborative interactive digital storytelling approach for remote learners. Frontiers in Education, 7. https://doi.org/10.3389/feduc.2022.942834

Porter, B. (2004). DigiTales : The art of telling digital stories. Bernajean Porter.

Psychology, Learning, Technology. (2022). In P. Limone, R. Di Fuccio, & G. A. Toto (Eds.), Communications in Computer and Information Science. Springer International Publishing. https://doi.org/10.1007/978-3-031-15845-2

Rizvic, S., Okanovic, V., & Boskovic, D. (2020). Digital Storytelling. Visual Computing for Cultural Heritage, 347–367. https://doi.org/10.1007/978-3-030-37191-3_18

Robin, B. R. (2008). Digital storytelling: A powerful technology tool for the 21st century classroom. Theory into Practice, 47(3), 220–228. https://doi.org/10.1080/00405840802153916