# Enriching the Learning Space using Digital Storytelling

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**ABSTRACT**

The social nature of the brain requires stimulation and connection for its survival. Stories are great for stimulating the brain and promoting learning. The art of storytelling is a promising instructional strategy that can be used to generate and disseminate stories with great impact on the recipients. Storytelling extends beyond the fields of media studies and communication as it can be applied across different fields, content areas and audience. Developments in digital technologies and the internet have made it possible to make stories as vivid as possible and its distribution as easy as the click of a button. Digital storytelling can be a very powerful tool in the learning space if teachers and learners can leverage on its potentials. This paper presents an overview of digital storytelling as well as possible challenges and considerations when creating and using digital stories. Information about tools for creating digital stories are also presented. This paper highlights the significance of digital storytelling for teachers and students beyond content delivery to students. It also highlights some researches that have been conducted on digital storytelling and their implications for engagement, motivation, comprehension and behaviour modification.

*KEYWORDS: Brain, storytelling, digital technology, learning, teaching*

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## INTRODUCTION

The human brain has a very interesting way of responding to stories; it constantly fires neurons when we listen to stories (Saponaro, 2014). These neurons are responsible for receiving information and communicating the information to its destination. Several neurons work together to form networks and the size of the network influences information processing. Stories bring people together as well help people understand, empathize and communicate with one another (Morra, 2013). Storytelling has been an intriguing and interesting way of transmitting information. It has been used to pass down knowledge from one generation to another (Samona, 2020). Storytelling has been used since time immemorial to present interesting stories in different forms; written in novels, recited in poems; acted out in plays; shot in movies, etc. When people watch/listen/read these stories, they are fascinated and captivated by them. Storytelling is one man's most powerful therapeutic tool (Travis, 2011).

In earlier times, recipients of stories have had to depend on their imaginations to visualize stories narrated by storytellers. Today, with the use of digital technologies, storytelling can be made more realistic and interesting. This process is termed digital storytelling. Digital storytelling can be a powerful strategy with broad applications and potentials for enriching learning experiences if teachers and learners harness the affordances it provides.

### Statement Problem

Advancements in technology offer opportunities to implement innovative teaching methods that can enrich teaching and learning experiences. However, a lot of classroom practices still demonstrate traditional lecture method characterised by teacher-centric approaches that places teachers as the sole possessors of knowledge rather than facilitators of learning. It also makes learners passive recipients of information rather than active constructors of knowledge. If teachers and students can use certain innovative strategies such as creating and using digital stories for teaching, assessment and other components in the learning space, it will be easier to promote student-centered learning, creativity, critical thinking,

collaboration and communication. To be able to do this, they need to be equipped with knowledge and skills regarding the tools required, processes involved, possible challenges to mitigate and the potentials of digital storytelling in the learning space.

Therefore, the aim of this paper is to explore digital storytelling, its tools, processes and potentials for teaching and learning. The specific objectives are to:
1. explain what digital storytelling is.
2. describe the tools and processes involved in digital storytelling.
3. discuss the significance of digital storytelling in the learning space.
4. discuss some challenges and considerations as regards the use of digital storytelling in the learning space.

## Literature Review

A story is a connected series of events presented using written or spoken words, still or moving imagery, body language, music, and several other forms of communication (LiteraryTerms, n.d.). Stories can be true or fictional (Travis, 2011). They can be used to communicate about past, present and future events. Stories can also be used to simplify complex content (Gils, 2005). They are to a very large extent more persuasive than facts. What makes stories memorable are the images (especially motion) and emotions attached to them (Sterenson, 2016). Stories are a powerful force for entertainment, connection and control. Every story has a person(s) listening/watching and a person(s) telling the story (Travis, 2011). Teachers and students can both be storytellers and listeners/viewers per time.

Storytelling is a form of narration where sequences of events are symbolically represented (Chatzara et al, 2014). The National Storytelling Network stated that storytelling should be interactive, make use of words and actions, present a story, and encourage listeners' active imagination. Dudley (1997) pointed out the sublime nature of storytelling which makes it inspirational and touching when listened/watched. There are several means through which stories have been told. They include oral storytelling (i.e. using spoken words from the mouth), visual storytelling (i.e. using visual media elements such as images, charts), written storytelling (i.e. using written words), and digital storytelling (i.e. creating and distributing stories using digital technologies) (MasterClass, 2020). As digital technologies can be used to capture oral, visual and written storytelling elements, they are considered very powerful tools for storytelling.

Learning is a process that unifies individual and environmental experiences to inquire, modify or enrich knowledge, skill, attitude, values, behaviour and world view (United Nations Educational, Scientific and Cultural Organisation, 2002). The part of the human body responsible for learning is the brain. Stories can change how we associate with others and appreciate different points of views (Pearce, 2019). Stories help us relate with one another as well as remember and integrate things learnt (Samona, 2020). According to Cozolino (2013), the human brain is a social organ that requires connection and stimulation for survival. Social interactions stimulate emotion, neuroplasticity (i.e. ability of the brain's neural networks to change through growth and reorganization), and learning. Neuroscientists stated that when we hear stories, a hormone called oxytocin is released. Oxytocin is also referred to as the love or bonding hormone. Oxytocin is released when people feel or imagine being close to each other (Sterenson, 2016). Oxytocin helps us feel empathy and connect to characters in stories (Samona, 2020).

Another interesting fact about the human brain is that, it can mirror the emotions that characters go through in their stories. This phenomenon is caused by a neuron called mirror neuron (Samona, 2020). Mirror neurons were first discovered in the brain of cacao monkeys by scientists. These scientists observed that the part of the monkey's brain that lights up when the monkey performs a task is the same part that lights up when the monkey watches other monkeys perform the same task (Chisholm, n.d.). Further studies showed that, it is same with the human brain (Keysers & Perrett, 2004; Cook et al, 2014; Keysers & Gazolla, 2010; Keysers & Gazolla, 2014). Mirror neurons make humans feel as though the actions in the story are actually happening to them (Sterenson, 2016). Stories help us empathize with the characters in the stories we view or listen (Pearce, 2019). Immersion in stories triggers the mirror neuron which makes the brain of viewers or listens of stories mirror the emotions of the characters in the story (Sterenson, 2016). When one is lost in a story, that is, deeply immersed in the experience created by the story, there is a combination of attention, anxiety and empathy. This is referred to as transport in storytelling (Sterenson, 2016). Yet another interesting phenomenon is the ability of the brain of a person telling a story to synchronize with that of the listener of the story (Sterenson, 2016). This phenomenon is referred to as neural coupling.

## Digital Storytelling

According to Saponaro (2014), digital storytelling is the integration of the old storytelling tradition and new technology. It is the process of telling stories using different digital multimedia (Robin, 2006). Multimedia is the combination of different media

elements such as image, text, audio and video. The use of digital stories is one effective way teachers can integrate technology into the teaching and learning process (Chatzara et al, 2014). With simple clicks, people can create, edit and share stories via the internet and other technological devices and social platforms. Digital storytelling supports social learning, emotional intelligence, different learning styles, collaboration as well as different types of literacies (e.g. digital literacy, global literacy, technology literacy, visual literacy and information literacy (Robin, 2006).

On a general note, storytelling is beyond content dumping. Creating good digital stories begins with good scripts (Robin, 2006). Good stories (scripts) come before technology and not the other way round (Saponaro 2014). Depending on how the stories are developed, they could be effective or ineffective (Samona, 2020). Messages imbedded in stories can make greater impressions when the story is told effectively. Creating an effective story is hinged on well-planned scripts (Samona, 2020). There are several elements of stories and by extension the art of storytelling. Robin (2006) described 7 elements of digital storytelling as point of view, dramatic question, gift of voice, power of sound track, emotional content, economy and pacing. The point of view expresses the perspectives of the storyteller. The dramatic question element requires that there be a resolution or answer to issues raised in the story by the end of the story. The gift of voice emphasizes the need to personalize and contextualize the story. The power of soundtrack is used to support the storyline and evoke more emotional connection to the story using the appropriate soundtrack (audio element). Emotional content that helps connect the audience to the story should be added in the story. The economy of the story speaks of the use of just the right quantity of content for the story. Pacing calls the storyteller's attention to the speed with which the story progresses. When a storyteller considers these different elements and integrates them into the story, the story becomes effective in transmitting the intended message.

Ya-Ting and Wanchi (2012) highlighted different phases in digital storytelling. They include preproduction, production, post production and sharing/publishing. According to Siu (2016), the preproduction phase is the planning phase where the audience, content and budget are defined. It involves the writing and reviewing of storyboards and shooting scripts. It is also a period to determine the length of the video including greetings and sign-offs. It is a period to create a production schedule; decide on whether to use a location or a studio for the shoots

and prepare them accordingly; decide on the equipment required for the production and post-production phases. During the production phase, the plans made during the pre-production phase are implemented. The video is shot as indicated in the shooting script. During the post-production phase, the shot video is viewed and edited to create the final video for sharing/publishing.

In digital storytelling, the role of technology is to capture, edit, share (view) and store the content, that is, the story. There is a wide range of hardware and software that can be used in digital storytelling. The hardware ranges from sophisticated cameras to simple phones for capturing scenes. There are several types of software (websites and apps) that can be used to create digital stories. Some of them are 30hands Learning, Animoto, BoomWriter, PhotoStory3, ImagineForest, HeadUp, Digital Vaults, Comic Life, Elementari, VoiceThread, Cloud Stop Motion, Gloster, Buncee, Zimmer Twins, WriteComics, UtellStory, Wakelet, Strip Designner, Tellagami, Storyboard That, Story Creator, Plotafon, Noisy Book, My Story, Little Bird Tales, Litehouse, Make Beliefs Comix, Nawmal, Pixton for Schools, Speech Journal, Storyjumper and Animaker Class (Kapuler, 2020). The level of complexity in these software differs. Presentation software such as PowerPoint can also be used to create beautiful digital stories.

**Learning Theories that support Storytelling**
Digital storytelling can be anchored on different learning theories, one of which is the theory of cognitivism which is also referred to as information processing theory. This theory emerged in the late 1950s and some of its proponents are Jean Piaget, Lev Vygotsky, John Mayer and Jerome Bruner. Cognitivism focuses on mental processes involved in learning. The theory focuses on the human memory and how to help learners transfer content from the short-term memory to the long-term memory. The human brain responds to stories by continuously firing neurons which are responsible for transmitting information to other cells in the body so we can think, feel and remember things (Vandergriendt, 2018; Wooldgridge, 2021). Two principles that emanated from this theory are chunking and dual-coding. As the working memory of the human brain can only process limited information at a time, it is important to chunk information presented to learners. In storytelling, information can be chunked into different sizes; this can be received as scenes, episodes, and so on. Also, as digital stories can be presented in video format, dual-coding (simultaneous stimulation of multiple sense organs) of information by the brain is strengthened.

Digital storytelling can also be anchored on the theory of connectivism which is also referred to as the digital age learning theory. Connectivism emerged in 2005 with George Siemens and Steven Downes as its proponents. This theory explains how the influx of digital technologies created possibilities for individuals to form networks with the help of the World Wide Web (www) and web 2.0 tools (social media) to expand knowledge. Digital stories are a means for people to express their opinions and share these stories with the world using various technologies and platforms. Some digital technologies that support connectivism include blogs, chat rooms, social bookmarking, social tagging, discussion forums, etc; all of which can be used to share digital stories.

## Applications and Effects of Digital Storytelling

Digital stories are being creatively generated and used by people in different facets of life to present information and get positive reaction from the receivers of such stories. Liu et al (2019) carried out a study which revealed that engaging students in the process of digital storytelling helped them develop multiple skills and literacies. It also increased students' engagement and motivation to learn.

Hewson et al (2015) noted that engaging students in creating digital stories increased their interest to learn. In their study, older generations were made to work with a younger generation of social workers (Post-secondary students). In a collaborative effort, the older generation provided the stories while the younger generation transformed and presented the stories digitally. They stated that the experience helped the older generation better understand the younger generation. They recommended the use of this form of transgenerational collaboration to prepare students for gerontological practice.

In Malaysia, Leong and Mohamad (2018) used digital storytelling in teaching English language on some young ESL learners (Primary 5 pupils). They reported improvements in the students' language skills. These improvements were noticed in their reading, writing and speaking. The use of digital storytelling has shown great impact in the lives of special needs learners. This can be seen in a study conducted by Chatzara et al (2014) on learners with Autism Spectrum Disorder (ASD). They stated several characteristics of people with ASD; one of which is the avoidance of social interaction with others. They prefer studying or playing on their own. They are also motivated to use computers and such related devices. Therefore, their learning content can be prepared as digital stories which can be viewed using their devices.

In another study conducted by Ofoegbu et al (2020), the use of digital stories was used to reduce the depression level of adolescent athletes to a statistically significant level. This was done in comparison with oral storytelling. In nursing education, Price et al (2015) used digital storytelling to equip nurses with a deeper understanding of palliative care. That is, working with patients who are near death as well as providing bereavement support to the families in the case of death occurrence. Their findings revealed that the students were able to comprehend the complexities in palliative care.

Cuffee et al (2022) conducted a web-based storytelling study on African Americans who were suffering from hypertension. The storytellers filmed were other patients who were able to manage their hypertensive states. This was done to encourage proper dieting, adherence to medications, and so on. The researchers stated that the digital stories were given to the patients in DVDs to watch. The stories were used to provide parasocial interaction. Their findings revealed that there was a statistically significant difference in blood pressure of patients in the treatment group who viewed the stories and those in the control group who had the usual care. These different applications of digital storytelling establish the applicability of digital storytelling across content, field and audience.

## Challenges and Considerations in Creating and Using Digital Storytelling

Good things too have associated challenges; digital storytelling is not exempted. When such challenges are identified, solutions can easily be proffered. As regards digital storytelling, some considerations teachers should bear in mind before implementing digital storytelling in their practice as highlighted by Robin (2006) are:

1. Availability and access to the technologies required for creating and using digital stories.

2. Internet access

3. Storage facilities for the digital stories that will be created. There should be considerations for both physical storage devices and cloud storage services.

He also highlighted some challenges students encounter when asked to create digital stories. Some of the challenges are:

1. Inadequate skill set to create effective digital stories.

2. Infringement of copyright associated with pictures, videos and other multimedia elements available on the internet.

It therefore implies that students and anyone who is interested in creating digital stories but lacks the required skills need to acquire such skills. As regards copyrighted materials, learners should pay attention to the type of license attached to materials on the internet. Robin (2006) also suggested that people generate their own media materials to avoid infringing on copyright of materials on the internet.

**Significance of Digital Storytelling in Teaching and Learning**

Digital storytelling can be incorporated into different aspects of the teaching and learning process where at different points in time, the teacher or the learner can be the teller or the listener/viewer of the story. Teachers can use digital storytelling to present learning content to learners. A close look at Bloom's taxonomy places the creation of digital stories under the higher level order skills in figure 1. The digital skills listed under creating on the taxonomy are blogging, podcasting, filming and directing. Digital stories can be written and posted in blogs (Blogging), they can be broadcast in audio format over the internet (podcasting), they can also be created in video format and this usually requires filming and directing.



**Figure 1: Bloom's Digital Taxonomy**
**Source: www.google.com/blooms's-taxonomy**

Digital storytelling can be used to develop learners' higher order thinking skills. It can also be used to help learners express their creativity and understanding of concepts. Thus, digital storytelling can be used as an assessment strategy for learners to demonstrate their understanding of concepts through storytelling. When digital storytelling is used for assessment, students are given the opportunity to be content curators where they express their creativity (Chatzara et al, 2014).

When students are given the opportunity to create their own digital stories, the 21st century learning skills 4Cs – Critical thinking, Communication, Creativity, and Collaboration are promoted. Digital storytelling is a tool that can be used to boost presentation and communication skills (Kapuler,

2020). As there are several processes involved in creating digital stories, collaboration efforts amongst students become authentic as the different roles can be well-defined due to the different processes involved in creating digital stories.

Teachers and students can experience deeper connection in the learning space when elements of the learning experiences and activities are presented as stories or linked with relevant and meaningful stories. As stories trigger emotions, emotions heighten our ability to memorize information and information processing is improved. Thus, it becomes easier for the information to move quickly from the short-term memory to the long-term memory. It further becomes easier for information recall; by extension, retention.

## Conclusion

Technology supports the creation and distribution of stories in different formats (audio, visual, audio-visual) and forms (poems, songs, movie, plays, etc). Teachers and students can use these different formats and forms to enrich the teaching and learning experiences. This will require them to be skilful in both the art of storytelling and in the use of the apprpriate technology. It is also important to collaborate with technically savvy personnel to bring well-scripted stories to life.

## Suggestions

1. Teachers and students should harness technologies that can help them create and share their digital stories.
2. Teachers and students should acquire the necessary skills to be amazing and effective digital storytellers.

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