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Digital Storytelling, an ICT-based method of Co-constructing and Transacting Curriculum

Abstract

The present paper is the documentation of the 'Digital Storytelling' (DST) project run by the authors with teachers and students in seven different goverment high schools. This academic process of creating digital stories and using them in several educational endevours are the central theme of this paper.

Introduction

India is seen to have the 'textbook culture' where the teacher is expected to restrict herself to 'covering' the contents in the textbook, with focus more often on memorising the text book contents, than in conceptual understanding. The authors worked with teachers and students in seven government high schools, in 'Digital storytelling[1&2]' projects, in which they visited local institutions, interacted with the staff in these institutions to understand their aims, processes and challenges. These interactions were recorded using cameras and mobile phones and the image, audio and video outputs were edited and refined to 'tell stories' about these institutions.

The process of making these stories and sharing the same with others in the school was intended to be an academic process, the digital outputs constituting curricular resources and the planning, recording, editing and sharing activities serving as teaching-learning activities. The DST also helped students get a holistic perspective of the work of these institutions, link concepts across school subjects, and create school community linkages. The process required students to collaborate in groups, enabling an environment of social constructivism. DST being processes of 'learning to create' and 'creating to learn', supported 'constructionist' approaches to learning. DST thus has a potential to improve the traditional curriculum and pedagogy processes in schools, by empowering teachers and students to actively participate in their own development.

Indian Curricular Context

Content and process (curriculum and pedagogy) are generally acknowledged

Some Definitions

1. In this article, the word digital is used in a broad manner, to include software, content which are stored electronically in a binary format as 'bits' and processes associated with creating, editing and sharing these. It is the ability of electronic machines (such as computers) to support the processing of such sets of 'bits' that has made the 'digital ICT' so powerful, since information can be easily and quickly created, shared, edited and stored.

2. The term "digitisation" is a narrower term than "digital". Digitisation refers to the creation of digital materials from nondigital sources. However in this section, we refer to the broader digital processes, since it includes all aspects of the DST activity including creating, editing, storing and sharing materials as videos, audio, image resources, as well as the interview preparation and conducting processes, editing the digital materials and presenting the multimedia outputs.

as the two intertwined components of learning. Eisner (1991) states: "Like the systole and diastole of the beating heart, curriculum and teaching are the most fundamental aspects." He however adds that, "No curriculum teaches itself, it always must be mediated, and teaching is the fundamental mediator," thus privileging the role of the teacher. India, however, has what has been termed a "textbook culture" (Kumar, 1988); the textbook is seen as the single, definitive resource for teaching. In most states, the department of education supplies textbooks free of cost to all teachers and students and officials usually emphasizes the "covering" of the textbook content as a key requirement of teaching learning process, restricting the teachers' agency. The emphasis on 'covering' the textbook is reinforced by the limited availability of alternative resources.

With the near universalization of elementary schooling, the number of first generation schoolgoers entering high school is increasing. Children come to government high schools with different learning experiences, from different higher primary school environments, different socioeconomic backgrounds, different mediums of instruction, etc. This creates an enormous heterogeneity of students in a high school in which a uniform textbook is not helpful. The provision of a single textbook fails to meet diverse needs of learners.

The prescribed syllabus, with its heavy focus on literacy, numeracy and content mastery, further inhibits the students and is one cause for the 'poor learning levels.'

In recognition of this challenge, the National Curriculum Framework for school education (NCF), 2005, has emphasized the role of ICTmediated teacher development and creation of contextual resources in contributing to an inclusive, resourcerich learning environment. In this paper, we will discuss the experiences of IT for Change[2] with seven government high schools in four districts of Karnataka (Bengaluru Urban, Bengaluru Rural, Mysuru and Yadgir), in using Digital Story Telling (DST) as a method for coconstructing curricular materials and teacher development. The authors have worked with students and teachers in these schools to create digital stories in multiple formats; as picture stories, digital maps, audio and video stories.

Digital Storytelling

The term "Digital Storytelling" (DST) can cover a range of digital narratives. It is sometimes used to refer to filmmaking in general, and as of late, it has been used to describe advertising and promotion efforts by commercial and nonprofit enterprises (Wikipedia). For the purposes of this article, we can understand DST as a set of processes in which teachers and students create multimedia documents that combine photographs, video, sound, music, text, and often a narrative voice to narrate a story.

Storytelling is not new for human beings and has served as an important method of expression and communication. Digital storytelling techniques which combine textual and nontextual formats, provide the possibility for stories to be told by more people and capture multiple perspectives. In our context being described, digital storytelling is used to describe any of the following:

1. creating picture stories, posters, infographics, maps, comic strips combining text and graphics

2. audio visual communication combining audio, visuals (still and moving) and text

The experiences of digital storytelling is presented in terms of skills built, involvement of different participants in education, creation of digital stories as curricular resources, their use in student learning, and its relevance for different subjects in school education.

Digital Story Making Steps

The DST processes broadly consist of three steps of planning, visiting and editing.

In seven government high schools, as a part of planning, groups of teachers and students had group discussions to prepare the questions and interaction probes for the members of the institutions to be visited. The teachers also alloted different responsibilities to the members of each group.

During the visit, the teachers and the students created digital stories by recording interviews of the members of the institutions, and taking photographs of people and institutions, mostly using cameras and mobile phones.

After the visit, each group sat together to discuss how they would put the collected materials together as a 'story'. The students documented their interactions in digital text documents using a text editor tool such as LibreOffice Writer. They also created presentation slides using a presentation tool such as LibreOffice Impress. The students edited and put together these text, image, audio and video editing resources using appropriate software applications such as Writer, Audacity audio editor, OpenShot video editor, RecordMyDesktop screen casting software, to create multimedia resources.

DST Process and Outcomes

1. Social Constructivism through Digital Storytelling

The DST project in the schools was consciously designed to be participatory, with a team of students and teacher(s) visiting an institution. The different tasks – asking questions, seeking clarifications, taking photographs, recording interviews in audio or video formats was divided amongst the students. Different small groups of students also interviewed different people in the institution. Thus the project emphasized collaboration, creating an environment of social constructivism amongst the students and teachers.

2. Participatory Approaches, Alternative Narratives

While the conventional story is about some incident or narrative which usually sits outside the learners' actual context, in DST, the attempt was to bring the lived realities and perspectives of the students, teachers and the community to the narrative. For instance, students of the government high school (GHS), Thyamagondlu, undertook a community mapping and documentation of a water tank near their school. The students interviewed the people who stayed near the tank. The history of the tank and how it had been an important water source to people in the village was shared by the interviewees. Students recorded their amazement at the role played by the tank in the past and noted with dismay how the tank had shrunk in size, and how its bed had become vulnerable to encroachments. The oral history documented from the community became an important learning resource and the students were able to articulate their own concerns about the loss of common village resources. This document also allowed the teachers to introduce conservation into the student's thinking, going beyond the conventional notions of development , often presented in textbooks.

A similar experience was observed in the DST undertaken by students of GHS Domlur, when they visited a bank. The students were very keen to know about the safety of deposits, as the bank uses these funds to advance loans to businesses, which may not be repaid. The issue of risk was intuitively understood by the students and were very keen to understand how the bank managed it. How the bank managed the logistics relating to the storing and movement of currency across branches and how the ATM was replenished also were matters of great interest, with the note counting machine becoming a key attraction. The human aspect of the nationalized banking system was seen by the students when the manager introduced them to a basket ball player who was over 6.5 feet tall and employed at the bank mainly to represent it in sports events. The bank became a living thing and banking suddenly relevant. Such an appreciation would perhaps be limited if the learning about banking were made only through the textbook.

Students of GHS Mallupura, GHS Begur, GHS Thyamagondlu and GHS Domlur mapped the surroundings of the school. After physically mapping the school and the neighborhood, the Mallupura students compared the map prepared by them, with Google maps and found out that the Google maps was outdated, as it did not show the new school buildings that had been recently constructed. Students were introduced to the idea of how maps can be powerful and how their own mapping could capture details that an external mapping may not capture. The spatial understanding of the village was strengthened by seeing the scaled representation of the village (including the school) drawn on paper. The physical mapping demanded that the students learn measurements, conversions and drawing and representation, combining mathematics, geography (map making) and history. The process of physical mapping was recorded by the students to create digital stories.

3. Connecting School and Community

While education is seen as a process of socialization, the school has often remained an insular institution. Community involvement in schools has been recognized as an important area of strengthening educational processes and the NCF talks about extending learning beyond the school.

Documenting local community institutions was thus an important objective of the school DST projects, building schoolcommunity linkages. Teachers and students together identified local and community institutions near the school, visited these institutions and interacted with the people working there. The objectives of this interaction were to understand the aims and priorities of these institutions, challenges faced by the staff and how they are addressing these, and the relevance of these institutions to society at large, and to the students' lives. All the seven schools designed and conducted interactions with a variety of public institutions that were close to their schools including library, primary health centre, veterinary hospital, animal shelter, police station, ward office (Urban local body), grama panchayat (rural local body), rainwater harvesting unit, fire station and post office. The visits also covered local businesses including bank, hand loom unit and different kinds of shops such as pharmacy, grocery, bakery, provision stores etc. Our general experience was that, if the teacher/school spoke with the key personnel of the concerned institution and explained the objectives of the DST, the institution was positive and welcomed the students. In some cases, the institutions indicated preferred timings, which were periods of relatively lesser work load.

Students from GHS Ejipura, GHS Thyamagondlu and GHS Jayanagara visited the local police station. In an inner city urban context, where students come from marginalized urban poor backgrounds, the police station does not enter the students' psyche as an institution to serve the public; their encounters may have often been not on that plane. Rather, students would have found the police station to be intimidating and a nogo place.

However, their interactions with the police staff allowed them to re-imagine the role of a police station as a community institution existing for citizen security and welfare. This re-imagining was particularly empowering for the girl students, and one of them said she wanted to become a police inspector during her presentation of her video essay at the school. Many students wanted to know from the officials, the qualification required to become a police officer.

The response of the policemen and women was equally forthcoming, they saw this as an opportunity to engage with the education of students. The nuances of crime detection, investigation, detention of suspects and interrogation, jurisdictions, communication across police stations (including through their radio) were earnestly shared with the students, who had several questions. In almost all the cases, the officials of the institutions visited, also saw it as an opportunity to share their own stories with the students, thus allowing the lived realities of the people in the institutions to also be captured as knowledge.

During a visit to the electrical substationm, students of GHS Thyamagondlu were not only able to get an idea about the supply of electricity from the (hydel and thermal power plants) generation points to homes and establishments, but also the complexities of managing power shortages and outages. The distribution manager discussed with the students, the challenges of storing and supplying power, which was overall in deficit, to villages and cities. The manager explained how during the 'examination period' of MarchApril, the electricity companies across the state tried their best to avoid power outages (by stepping up power generation), so that students could study undisturbed.

During visits to the Ward office and the Panchayat office by the students of GHS Domlur and Motanahalli respectively, the challenges of providing and maintaining social amenities (including roads, transport, power) as well as meeting the dynamic and multiple needs of different communities in the area, emerged in the discussions with the officials. One of the students from GHS Domlur wanted to know why the garbage dump near his house remained uncleaned whereas other areas are maintained cleaner, suggesting his concern with civic issues. The "local government institutions" were seen as institutions on which they could raise claims, articulate concerns and demand accountability. Political Science, which teachers of social science sometimes see as an additional burden, became more interesting.

A very powerful example of learning outside of the school was observed in GHS Motanahalli which shared a compound wall with the local veterinary hospital. Animal physiology lessons had remained confined to the textbook, till the science teacher took her students to make a digital story of the hospital. The doctor at the centre discussed the diseases from which different animals suffered, through live demonstrations. The teacher and the students felt that this greatly helped them connect their textbook contents with what was happening in reality

and gave them a deeper insight into the concepts they would have otherwise dealt with as bookish facts. In a rural area like Motanahalli, the knowledge of how a veterinary hospital worked was also relevant to the everyday lives of many students.

While many of the students pass by these institutions on their way to school and back, they may be quite unaware of their functioning. Through the narratives built from the DST activities, the students were able to develop a deeper understanding of these institutions.

4. Holistic Learning, Transcending Disciplinary Boundaries

When they recorded the oral history of the community tank in Thyamagondlu, students learnt elements of history (story of the tank over decades), geography (water source, uses), science (water cycle), environmental sciences (pollution), sociology (local cultural practices connected to the tank) in their interviews. The visit to the bank helped students understand banking in a more integrated way, encompassing commercial arithmetic, accounting and economics, through their discussions with the staff.

Teachers and students often found it impossible to confine their investigations to a particular subject area, whether it was a visit to a rainwater harvesting unit or a hand loom unit or the veterinary hospital. The questions that engaged the students often cut across disciplinary boundaries and this also encouraged teachers of different subjects in the school to collaborate to support students in designing questions and analyzing responses during the DST.

5. New Processes of Curricular Resource Development

In a few schools, teachers and students came together for a common viewing of the videos developed by different teams, and post the viewing, had discussions on what they had seen and understood. The resources developed by the students and teachers thus became curricular resources for the school to use in addition to the textbook. The 'local' nature of these narratives, involving them and their teachers, intrinsically made it interesting for the students and teachers. Digital stories can also be seen as powerful exemplars of constuctionism 'learning to create' and 'creating to learn' with digital artifacts.

Some of the schools have uploaded these DST outputs as 'Open Educational Resources' on the 'Karnataka Open Educational Resources' (KOER) website, making these available to other schools as well. The digital nature of these OER means they are easy to retain, reuse and revise by teachers for the same or other cohorts of students.

6. Changing Pedagogies and Classroom Discourse

Storytelling is an old method of teaching-learning. Teachers have packaged their lessons as stories to help students understand concepts as well as their implications. However, DST allowed the teacher and students to combine still imagery, moving imagery, sound, and text, as well as being nonlinear and contained interactive features to create a digital story that went beyond traditional forms of storytelling.

In the context of the classroom, the distributed nature of DST makes it powerful. While teachers have traditionally acted as disseminators of content to students, the origin of a narrative, as seen from a student's inquiry has the potential to alter the communication patterns in the classroom. The bringing together of different competencies needed for DST allows more students to emerge as

leaders in a classroom scenario. The collaborative nature of the assignment instantly changes the onetomany nature of classroom conversation. In the realm of digital technologies, often students and teachers are similarly placed in terms of skills and are learners alike. This can alter the teachers' power as the sole knowledge giver and allow them re imagine themselves as a collaborator and colearner. This could lead to more democratic classrooms.

DST processes allowed students to document knowledge, create their own knowledge from the inferences from data they collected in their interviews / investigations. The Motanahalli students explored the range of responsibilities shared by the grama panchayat officials to compute the physical and financial resource requirements of the panchayat. GHS Thyamagondlu students who created picture essays of the local vegetation (with the school compound, they enumerated more than 100 species of trees and plants), constructed a taxonomy of these plants and made inferences on the biological diversity within their own school premises and the vegetation outside their school (this was also due to horticulture being a co-curricular subject in the school, where the teacher for the subject had worked with students over years to develop the flora within the school premises). The mapping also helped students to see the need for sustained and long term efforts to build such a green environment.

DST can stimulate student imagination and creativity. For instance, to conduct a geographical mapping of their local area, students from these schools used a bicycle to measure distances. They recorded the number of turns of the cycle between two points and deduced the distance by multiplying this with the circumference of the tire. This was useful to measure longer distances

outside the school. When documenting local institutions, students framed the questions by themselves, recorded the interviews, transcribed the responses and created presentations and video essays, all of these academic processes in and of themselves. The diverse activities and the range of outputs allows for expression of multiple intelligences of children and showcasing of diverse abilities.

Often, some students who tend to be withdrawn in the regular classroom processes, become active participants in DST. Whether it is wielding the camera to record the audio or visual, or in measuring the distances and layouts of institutions in spatial mapping, teachers are surprised by the enthusiasm and initiative shown by students, who have hitherto not been active in the readingwriting processes of learning.

7. DST as Transaction

We observed that digital stories could be used by any subject teacher in teaching-learning processes. Starting from documenting oral history with multiple perspectives to creating narratives of local importance to observing and documenting the local vegetation, digital stories supported learning processes in history or geography or science. Documenting community institutions made political science a proximate subject and not abstract theory. For the language teacher, DST was an opportunity to build and strengthen diverse communication skills in students, of absorbing and producing communication material in varied and complex formats. The processes of developing a story, identifying the actors, using appropriate media to present an idea, editing and compiling helped students learn communication and documentation skills, key language competencies.

DST is a process of communicating learning as well. Post the development of the digital stories, students presented the stories for their classmates. Students provided clarifications from their visits, to their group members, thus actively sharing from their own knowledge.

8. Strengthening the Role of the Teacher

DST enables teachers to move beyond being "'minor technicians" (Scheffler, 1973), who merely utilise the available resources with limited engagement with additional or alternate curricular resources and teaching methods. DST provides new approaches to creating curricular resources, developing activities and assessments, providing opportunities for contesting the textbook culture and changing classroom discourse. DST impacts both content and process, through the use of digital technologies and hence enables the teacher to improve her 'technologicalpedagogicalcontent' knowledge.

Concluding Remarks

The teachers and students of the Seven schools created digital stories of their interactions with various local community institutions. Schools can plan similar visits to the institutions in their own vicinity. The teachers and students need to design these interactions, by preparing relevant questions relating to the working of the institution. Digital devices for recording the interactions, this can even be only mobile phones, are required to be carried by each group. The recordings will need to be edited, for these free and open source image, audio and video editors are available. DST can be planned by a school as a part of its academic calendar and enable teachers and students to create digital curricular resources from their interactions with the institutions.

1. Making School Education Contextually Relevant

The NCF 2005 has emphasized on the need for constructivist approaches to teaching learning and the role of community in child's learning. The NCF position papers (Science and Social Science) discuss the importance of connecting learning to real life contexts. The school is often seen as an artificial space, and students can feel disconnected to the classroom transaction. DST can help make the classroom learning relevant by allowing students to cocreate local resources connected to the topic, and bringing local experiences to the learning. The processes of creating digital stories can be used to mentor students in developing inquiry based projects for supporing their own learning.

2. Making Learning an Integrated, Personal Experience

Interdisciplinary learning and project based approaches have been recommended for enabling constructivist classrooms. Digital technologies can provide one powerful method of integrating pedagogy across subjects and providing an integrated perspective. The DST process can be seen an example of constructionist learning, where digital artifacts' creation and learning are in a dialectic, of learning to create and creating to learn.

Far from the typical picture of teacher burdened by communicating the syllabus to an uninterested student, the classrooms which have tried this approach have been alive with students' discussing, directing and negotiating the process of their own learning. The teachers have been able to truly perform the role of the facilitator as they stepped in to support and guide the students' learning. This is perhaps best captured in the

following remark from one student of GHS Thyamagondlu, when he told his teacher "I am unable to change the interview date with the manager of the bank. We will do it on our own if you are unable to accompany us".

Schools where Teachers and Students did DST

1. GHS Begur, South 3 block (Bengaluru South district).

2. GHS Thyamagondlu, Nelamangala, (Bengaluru Rural)

3. GHS Mallupura, Nanjangud, (Mysuru)

4. GHS Motanahalli, Yadgir, (Yadgir)

5. GHS Domlur, South 3, (Bengaluru South)

6. GHS Ejipura, South 3, (Bengaluru South)

7. GHS Jayanagara, South 3, (Bengaluru South)

References

1. Department of School Education and Literacy, Ministry of Human Resource Development, Government of India. (2012). *National policy on Information and Communication Technology (ICT) in school education.* New Delhi, India. Retrieved from http://www.itforchange.net/sites/default/files/ITfC/revised_policy document ofICT.pdf

2. Eisner. 1991. What Really Counts in Schools. Educational Leadership, pp. 10-11. Retrieved from http://academic.wsc.edu/education/curtiss_j/eisner.htm

3. Karnataka Open Educational Resources website - http://karnatakaeducation.org.in/KOER/en/index.php/Main_Page

4. Kumar, K. (1988). Origins of India's "textbook culture". *Comparative Education Review 32*(4), pp. 452-464.

5. Retrieved from https://www.jstor.org/stable/1188251?seq=1#page_scan_tab_contents

6. Mishra, P. & Koehler, M.J. (2006). Technological Pedagogical Content Knowledge: A Framework For Teacher Knowledge. *Teachers College Record, 108*(6), 1017-1054. Retrieved from http://punya.educ.msu.edu/publications/journal_articles/mishra-koehler-tcr2006.pdf

7. National Council of Educational Research and Training. (2005) *National Curriculum Framework.* New Delhi, India. Retrieved from http://www.ncert.nic.in/rightside/links/pdf/framework/english/nf2005.pdf

8. Scheffler, I. (1973) *Reason and Teaching.* London: Routledge & Kegan Paul Ltd.