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Digitally retelling the tale: children's learning encounters and materiality

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ABSTRACT

While much existing work on digital storytelling with young people has focused prominently upon presenting their own personal narratives and viewpoints, relatively little attention has been given to learning that could arise from digital adaptations by young children of existing and well-known stories. This article reports work exploring learning activities through a case study involving three pupils (aged 8, 10 and 12) and their teachers engaged over a six-month period in digitally retelling a fairy tale from a printed storybook. In addition to considering the role of the printed text and the learning opportunities arising from its digital retelling, discussion focuses on how the findings cohere with more recently developing theoretical perspectives on learning that in addition to the social take into account the role of the material.

Keywords: digital storytelling, sociomateriality, dialogical learning, triological learning

Introduction

The scope for storytelling using digital technologies readily available today has attracted interest in relation to children's learning and development. It extends an existing and broader literature on the value of stories as a source of knowledge, organising and structuring information and thinking (Hamilton and Weiss 2005),

providing a context where new words are encountered and given meaning (Axelsson and Horst 2014) and developing communication skills as children discuss the text and illustrations (Kaderavek and Justice 2002) which in turn are needed for collaboration, and learning to work with others (Wood and O'Malley 1996). The different forms digital stories can take through combining voices, images, music and other sounds, together with accessibility and ease of use of the technology has led to the power of the voice of the first-person as a central feature (Lambert 2002). Scope for developing a sense of identity as well as creative expression is evident in a growing literature on 'digital storytelling' by children and young people which, along with informing or recounting events, has focused largely on their own personal narratives and viewpoints (Alexander 2017). This is apparent in activities such as 'restorying' where the emphasis has been on the intention to bend an existing text to prominently introduce the self or a diversity of other perspectives into the narrative (Thomas and Stornaiuolo 2016).

What remains less explored is where the printed text of an existing story is digitally adapted or retold by children without the intention to consciously engage in a major bending or departure from the original. However, this does not suggest a simple replication or fidelity to the original as any retelling will inevitably impose the cultural presuppositions (Stephens and McCallum 1998) and markings of the agenda of those carrying it out. Whilst literary adaptation is an established topic for older age-groups, relatively little attention has been given more generally to the learning that might arise from digital adaptations *by* young children of existing and well-known stories, rather than digital adaptations *for* young children (Berger and Zezulkova 2018).

As well as human involvement, digitally telling involves a range of non-human or material resources quite centrally in many ways. The affordances of material resources may determine how a story is told in relation to the demands and decisions

involved when working across modalities. The ease of recording and reviewing digitally allows scope for critical reflection, not only in a final form but also at ongoing stages of production. Even the act of recording an otherwise non-digital performance brings into existence an additional material resource that allows repeated scrutiny by, amongst others, its creators. However, in addition to digitally telling, digitally retelling brings in the printed text itself as a further element that can play a role in its own adaptation which can be examined along with other human and non-human resources.

In this article we report on work that investigates the learning issues that arise when children work together to digitally retell an existing story published in book form. Additionally, however, in view of the material resources including the original printed text involved, we will examine how their role coheres with developing theoretical perspectives on learning that as well as the social context take into account the role of materiality.

Social and material encounters in learning - theoretical perspectives

Leading on from the work of Piaget (1936; 1957; 1964) and Vygotsky (1962; 1978) more dominant perspectives on learning have raised the profile of the agency of the learner as well as language, social and cultural factors in thinking and generating understandings (Jessel 2016). Acting intentionally, using initiative, developing and using strategies, reflecting on evidence and actions can be extended from the individual learner to the group has been expressed through social-cognitive theory (Bandura 2001), and agency as having inter- as well as intra-mental qualities has also been recognised from a sociocultural perspective (van Lier 2008; Schoon 2018). Within this, dialogic interactions (Bakhtin 1986) extend across activities with knowledge emerging as people

work together contributing different views and through this generate meanings.

Talk and learning in relation to material objects has been given explicit recognition through theories such as distributed cognition (Hollan et al. 2000; Hutchins 1995; Pea 1993), activity theory (Engeström 1999) and actor-network theory (Latour 2005). Referring to distributed cognition, Hollan et al. (2000) extend the notion of what is cognitive to include interactions between people, resources and materials. In their 'triological approach' Paavola and Hakkarainen (2014: 55) argue that external knowledge artefacts structure human interaction and 'provide a concrete common ground and mediating element for collaboration' and that digital technologies can facilitate this.

The importance of material objects has been acknowledged in other strands of literature. Notably, Barad (2003: 801) has observed that while language, discourse and culture matter, 'there is an important sense in which the only thing that does not seem to matter anymore is matter'. Reflecting Barad's work and using the term 'sociomaterial', Orlikowski (2007: 1437) opposes the notion of humans and technology existing as independent entities with inherent characteristics that shape each other by arguing the social and the material are 'inextricably related'. Rather than being encapsulated as a single theory, sociomaterialism has been regarded as a tradition (Johri 2011) and can refer to diverse approaches. While ontological differences have been argued (Bavdaz 2018), there are commonalities. Fenwick (2015: 87), for example, draws attention to a move away from inherent distinctions between social phenomena and materiality towards 'heterogenous assemblages' of 'natural technical and cognitive elements'. The notion of 'material' has been taken broadly; not necessarily physical (Leonardi 2012) or having matter (Orlikowski 2000), and Fenwick et al. (2011) include tools, technologies, bodies, actions and objects, texts and discourses along with settings. Materials allow

some actions and not others (Fenwick 2015) and in turn, 'materiality' can be expressed in terms of the relationship or experience arising from such affordances.

Regarding knowledge and learning, Barad (2007: 379) draws attention to the role of 'direct material engagement, a practice of intra-acting with the world' and 'material- discursive processes' (140) through which phenomena 'constitutive of reality' (140) emerge. Through an 'agential cut' (140), or 'particular observation' (Hetherington and Wegerif, 2018: 38), some aspects of the world become apparent and meaningful while others are closed off. Hetherington and Wegerif also use the notion of material-discursive processes to extend the nature of dialogue as conceived by Bakhtin (1986: 31) to include the "'voices" of the material'. The performative approach to knowledge entailed through their 'material-dialogic' account is also consistent with Fenwick et al.'s (2011) distinction between representing and understanding a world out there and a view of the world as doing things. Here, rather than humans or objects separately having agency, 'force is exercised through [...] sociomaterial assemblages' (Fenwick et al. 2011: 3). Returning to Barad (2007: 33), the existence of agentic qualities is only 'in a relational, not an absolute, sense, that is, *agencies are only distinct in relation to their mutual entanglement; they don't exist as individual elements*'.

From their work, Gourlay and Oliver (2014: 145) also emphasise the coordination of a range of human and non-human actors and argue that learners' practices are determined by the social and material and are an 'ongoing, improvisatory process of both adapting to the environments in which they work, whilst also adapting these environments'. In this way improvisation resonates with Levi-Strauss' (1966) 'bricolage', a recognition that, rather than adhering to prescribed plans and established tools and practices, people use resources and tools they have readily available in new ways. In turn, Johri (2011: 212) offers the notion of a 'socio-material bricolage' as

applicable to ‘the emergent and socially and materially intertwined nature of human practices’.

In sum, whilst learning arising from digital retelling can be considered from cognitive, sociocultural and dialogic perspectives, these alone do not explicitly and substantially address the role of material objects. Although accounts such as actor network theory and trialogism do directly address the role of objects, this is through interaction between separate human and non-human entities. In contrast, sociomaterial accounts regard agency in learning as neither located in human nor non-human resources but arises through relationships and intra-actions, and what emerges through social and material relations, rather than pre-planned, can be seen as ongoing and improvisatory.

We now consider the above perspectives in relation to a largely unexplored context where children work together to retell an existing printed story, in this case a fairy tale, using digital technology along with other resources including multimedia adaptations of the story readily available online, and where the pupils are able to participate, discuss and reflect upon their work as they progress. In particular, within this context of retelling, we will consider the contribution the printed story makes to learning and its contribution as part of a sociomaterial assemblage.

The context of the study: setting and participants

The work was carried out as part of a Paul Hamlyn-funded project on multilingual digital storytelling¹ that extended over a five-year period. The overall project involved students and teachers in twenty complementary and mainstream schools in and around London, and overseas. In this report the focus is on three young children and two of their teachers in the context of heritage language development whilst attending an international school in Surrey (UK). Dora (F, 8), Ivan (M, 10) and Ana (F, 12)

(pseudonyms) were born in Croatia and in the second year of a two-year stay in UK. Although their native language was Croatian with English treated as an additional language, the aim of the school was to develop their Croatian as well as their English and to this end Dora and Ivan had five one-to-one Croatian mother tongue lessons each week, and Ana four. Although of differing ages, all three children were able to meet together with their teachers, a Croatian mother tongue teacher and an art and design specialist, once a week in a film club held after school.

Research approach

With the aim of analysing in detail a specific group of participants engaged in a specific activity within a given time-frame in their school setting, a case study approach was adopted (Miles and Huberman 1994). This allowed authenticity of the learning situation to be retained and a holistic account to be drawn from the range of data examined (Yin 2014). Case studies, flexible in terms of ontological position (Rosenberg and Yates 2007), allow exploration and identification of influencing patterns and processes (Newby 2014) and enable illustration and illumination of points arising from the theoretical issues introduced above (Merriam 2009; Hartley 2004; Cohen et al. 2007). Whilst, more generally, understandings of issues in real life settings can be sought through exploratory and explanatory case studies (Mills et al. 2017), for present purposes an exploratory case study approach is adopted in that it provides scope to illustrate conceptual arguments.

Data were collected through audio recorded semi-structured interviews conducted by the first author with the three pupils and two teachers. Field notes and classroom observations were supported by photographs, documents (including pupils' sketches and drafts) and other artefacts. A reflective journal for each pupil also invited open ended responses to specific questions. In addition to a video of the digital story

made by the children and the rehearsal, further video recordings were made of the children in the process of making their digital story, and of discussions made with the teachers and children reflecting on the process. Planning and production activities took place weekly over a six-month period within the school year. Ethical principles, including informing participants of the aims of the work and right of withdrawal were observed, letters of permission regarding pupil participation were obtained along with signed consent forms for all participants, including school management.

Data analysis involved making verbal transcripts of all the recorded interviews, and transcripts of the recorded digital story were used in conjunction with the video recordings. Key episodes in the storytelling process were identified through coding and a thematic analysis of observation notes, video and audio recordings and interviews and other materials including the storyboards, photographs and field notes. Focus on the activities, participants and materials involved with the digital retelling, and for analysis of the case study data, was guided by Erickson (1986: 152): the data recursively examined so that: quotes from transcripts and details from field notes provided ‘particular descriptions’; ‘general descriptions’ derived from accompanying explanations provided context and indication on whether quotes or events were unique or representative of a pattern of behaviour; an ‘interpretive commentary’ provided a broader research narrative with the data considered within a theoretical or analytical framework. The findings are structured under headings that signify patterns or instances of interest identified within the general descriptions and backed by particular descriptions and, where applicable, an interpretive commentary within the same subsection. The concluding section draws together main observations relating to learning and pedagogy along with key theoretical implications.

The story

The storytelling activity was linked to the school curriculum in Croatia where the stories of Ivana Brlić-Mažuranić (1874-1938), a Nobel Prize nominated writer often referred to as 'Croatia's Hans Andersen', are regarded as part of the national culture. In response to the project-wide theme of fairness, the story, a fairy tale, that was chosen follows the encounters of a young man in an enchanted forest, 'Stribor's Forest' (Šuma Striborova). Written in Croatian and inspired by Slavic mythology, the text (Brlić-Mažuranić 1916) is nearly 3,000 words long with one full-page pictorial illustration..

Told through narration and exchanges in direct speech, a richly woven plot follows three main characters signified only by generic names. Briefly, a young man, referred to as the son, enters a forest, Stribor's Forest, that unbeknown to him is enchanted, and meets a snake. The snake, a human being transformed because of their sins, then presents as a beautiful girl whom the young man marries and takes home to his mother. As the story unfolds, we hear how the girl, now referred to as the daughter-in-law and who has cast an influence over the son, treats her mother-in-law cruelly until her identity as a snake is revealed. Other characters that are part of the forest's enchantment are instrumental in this revelation and following a visit to Stribor, the mythical Lord of the Forest, the daughter-in-law turns back into a snake, the enchantment ends and the mother forgives the son.

Findings and discussion

The role of the printed story

Ana, at the age of 12, was familiar with Brlić-Mažuranić's work as a pupil in Croatia, Ivan at 10 would have heard of her work, but was at a stage where this was about to be part of his planned curriculum, while for Dora as an 8-year-old, the work would be less familiar as the language in the story would be relatively advanced for her age. The story has been widely adapted and, apart from the original text in Croatian, the children had

access to a range of adaptations online. These included an animation with narration, a radio dramatisation, a recording of a theatre production, a film made in a naturalistic setting, all professionally produced, and an animation with a music background (without words) made by children in Croatia. Apart from the professional animation with a Croatian and an English narration, all the versions of the story were spoken in Croatian.

After reading the story at home, Ana and Ivan read segments in Croatian aloud in the classroom and with Dora watched the adaptations. From the onset the children were gaining a sense that, rather than being a fixed entity to be learned, the story was an example of literature that was open to interpretation and reconstruction as suggested by Ana's comment:

We had to look first of all at the real movie ['real' here refers not to a perceived definitive version of a film but is a convenience term for a naturalistic setting; not on stage or artificially created], read the book again, watch a cartoon, watch a theatre play, see what the other kids did, like their own workshop and see the radio drama, like listen to the story, and then I was trying to, like, combine, me and Ivan and Dora, we were trying to combine some really important scenes in the story.

Seeing 'what the other kids did' also suggests peer involvement and scrutiny; retelling is negotiable, its form and content arising from choices or decisions and taking ownership in the process rather than accepting a lead from an authority. While 'read the book again' could be seen as a discrete or repetitive act solely for recall, that it was driven by the aim of recasting the printed text into a sequence of words, images and actions is suggested by Ana's follow-up comment 'We kind of followed the story but then we also had to discuss about it like did we agree to put this here'. That some of the scenes were seen as 'really important' also suggests that re-reading was not simply a matter of imbibing, but for a purpose that lay beyond the immediate text as presented; an intellectually active process that involves making judgements about what was 'really

important' and, for that matter, what was not. This was in a context where 'trying to combine' what they regarded as important moved attention beyond sequencing towards making connections in relation to a broader narrative or purpose behind the story. Moreover, saying '...we also had to discuss about it like did we agree to...' further suggests not only a social dimension but intellectual collaboration and that critical engagement, rather than apportioning tasks, was involved at this stage. This would inform decisions made on what is drawn from the original text, how it is interpreted and might be retold in relation to the affordances and constraints arising from the technology and materials used. Collaboration, then, was taking place in relation to the story as a tangible entity that, rather than something abstract, was being re-created. Here the printed text formed part of the relationship and along with the different adaptations contributed to a material-discursive intra-action. The original text, rather than solely and predictably determining its retelling, nevertheless acted as an important coordinating thread within and throughout the relationship. If what was retained and given particular meanings is regarded as 'knowledge' then, as (Baroutsis 2018: 20) argues, it 'is not fixed, but constantly shifts, forms and reforms through the spatialities and materialities of classroom practices and pedagogies'.

'Scene' as a unit for discussion and analysis

Over its nine pages the printed story involves both human and mythical characters and a plot transcending many different settings and situations. When adapting, the intellectual demands included identifying and signifying in some way the elements in the story to be preserved, how the children talk about them to each other, represent and sequence them. In response to the question 'How easy was it to decide which ideas would work best for you?' Ana uses 'scene' repeatedly:

Well, first of all I think maybe we could put this scene or that scene and then we kind of like talk which, is it a good idea, and then we, everybody goes like one scene for that are existing, and then Ivan did the scene where the grandma and girl met, er, and I added a scene where the grandma is lighting a fire.

Throughout the children's comments, 'scene' emerged as a convenient term for representing different parts of the story and, in turn, making discussion more manageable. Regarding how scenes are put together, Ana also commented:

Well you kind of connect them like for example when the, I do the scene where the boy meets the girl, and then Ivan does the scene when the grandma and the girl meets and you kind of make it look more like the boy and girl walk into the house and just opening the door and they talk.

While 'scene' has been applied to printed narratives (Herman 2009), the term is frequently used in film or stage productions where visual and sound cues can help suggest changes such as location, time, or characters present. However, scenes are not precise or discrete units and can represent a continuum of meaning (Monaco 2009). In sociomaterial terms, 'scene' could both promote and be promoted through intra-activity. The pupils' reference to 'scene' reflected this and, as illustrated below, was determined according to the relationship with different parts of the text and the different ways these could be encapsulated. Although 'scene' could be problematic, the term was readily available and worked as a way of articulating ideas about the printed text in relation to its digital retelling and in this way exemplifies Johri's (2011) notion of sociomaterial bricolage.

Scenes and storyboards

Scenes were linked to storyboard sheets. Ideas for each scene were notated on A3 paper templates with space for a main image along with smaller areas for such details as

accompanying words and camera directions. Ana takes us through the example shown in Figure 1:

The next scene is the boy cutting the tree. And from the tree the snake comes, and the snake comes out of the tree and, er, he starts to take advantage of the boy, and it's not a real snake it's a person who is really evil and really bad and turns into a snake.

Within this scene is a combination of elements that cohere into a significant unit in the story that Ana is able to verbalise: we are introduced to a new character with a particular agenda and tensions at the centre of the story that will drive the narrative forward.

Figure 1 about here

In another example, elements represented by images and words in a storyboard sheet for 'the lake scene' comprised a subsequence: 1) the Daughter-in-law/Snake telling the Mother to go to the frozen lake to get a fish for breakfast; 2) the Mother expressing fear that the ice will break and that she will fall through; 3) the Son laughing as the Daughter-in-law/Snake says that the fish will be happy; 4) a bird dropping a fish into the Mother's arms, and, 5) the Mother expressing thanks to God.

As further renditions of different scenes emerged the storyboard became an important part of the thinking and sharing of ideas. Altogether, sheets were constructed for thirteen scenes delineated in ways that included introducing significant characters in the story, or meetings between them, change of location, emotion, or event. As well as working together, the pupils worked alone on different storyboard sheets which were then further discussed. In effect, the pupils moved in and out of a discursive space according to the demands of the moment. Within this dynamic (Jessel 2016) the storyboard sheets acted as convenient notation for content, intra-connections and sequencing. Along with the scenes, the storyboard sheets formed part of a sociomaterial

assemblage with its own agency (Bennett 2010; Fenwick et al. 2011): how the scenes shaped, and in turn were shaped by the story became a significant factor that emerged.

Words as part of a sociomaterial assemblage

Apart from in the film club with the art and design specialist, dialogue among the pupils was mediated in Croatian. Although the original story text was in Croatian, finding words for the adaptation, also in Croatian, was not straightforward. Evolution in the language was evident from the older forms of expression and vocabulary used by Brlić-Mažuranić and discussions regarding nuances of expression in the original text. This occurred during the mother tongue lessons as well as in English during the film club and drafting a translation for English subtitles. Ana draws attention to subtleties in meaning carried by words and limitations in translating when, for example, referring to 'šuma' in the title 'Šuma Striborova' she points out:

The story is also in some Croatian old words, for example, the kind of which are words that are not familiar to us which we don't really use any more. For example, 'dubrava', it's the name for the forest and we say 'šuma' but it's, like, completely different.

Her reference to 'dubrava' brings with it an allusion not to any forest, but to a forest with the Slavic word dub, an oak grove, at its root, and one that also carries mythological overtones. She continued:

... then we're thinking should we leave some words, or should we adapt the whole story and then we chose we're going to use some words and we're going to adapt some words. Like have it equally. ...cos the old words make the story so much better ... more magical, good, and how like the writer still alive, kind of, in the story.

The particularities of the printed text and the selection of words used in the retelling brought with it a perceived need for discussion and decisions:

Well we had to debate, for example I wanted to change some words, Dora wanted to change all words and then we go like in debate, and then we all figured out it, it's good to have one section of words from the real writer [the author] because they are really magical and really nice and very good words and we don't see them.

Again, phrases such as 'we all figured out' not only suggest working together, but also a level of collaboration where ideas central to the narrative and the style of the text were handled with sophistication. Awareness amongst the pupils that keeping all the older Croatian words would have limited the discussion to a more restricted form of translation is suggested by Ana's comment:

...and to do some words by us, cos it will be kind of copying if we do like all sections from the book and we just put them in the paper and have it like that.

While keeping some words and changing others raised the intellectual nature of the children's encounters, from the above episode the words used in the original text could also be seen as playing a further active part within a sociomaterial assemblage. The words changed and were changed through the discursive activity that was prompted.

Extending the materiality

In addition to words and storyboard sheets, other modalities and resources that contributed to an overall coherent digital communication can be examined. Although storyboard images had been sketched, further discussion was needed on how they could be translated into a filmable form. As part of the overall project the pupils attended film-making sessions where they were introduced to a variety of techniques including use of

greenscreens and animation. However, the prospect of animation was not attractive to Ivan:

Twenty-four times. I mean to make one step you need to make twenty-four drawings!

Arising from the experience of the art and design teacher, 'shadow puppets' were considered as an alternative. These comprised cutting out shapes in materials such as card or paper to resemble characters or objects depicted in the story so that they could be held in front of a light source to cast shadows onto a translucent screen through which they could be viewed. An old overhead projector as the light source also led to the shadows being set against different backdrops with scenery drawn in colour on transparencies that could be changed as the story progressed. Figure 2 shows the beginning of the lake scene from the final recording as an example of the overall effect.

Figure 2 about here

The use of shadow to help convey the story became a focus for experimentation and discussion as Ivan recounts:

We experimented a lot ... sometimes it didn't turn out the way we wanted so, but in shadow puppets you can go like you can cut one part and just glue it again, you can't see like the glue like the sticky tape.

His comment was reinforced during an interview with the art and design teacher:

Paper cutting is very forgiving. The shadow is the only thing that counts. The puppet can be ripped, repaired, altered, and no-one will ever see mistakes.

The pupils, aware of the freedom this offered, made frequent adjustments to the puppets as they tried them out with the projector. The shadows were not static: puppets were moved to suggest walking, chopping a tree, looking up at something and one character

talking to another. The pupils also used their hands and arms to cast shadows that could change shape as they moved. Movement, then, allowed another level of expression experimented with such as when producing shadows resembling a bird in the lake scene, or the snake emerging from a tree stump. Combined with acting that involved how words were voiced, and the expression put into sound effects such as chopping the tree or walking across the snow, scope for discussion, problem-solving and experimentation was evident. For example, how you animate the narrator beyond a mere a voiceover and communicate this through shadows made demands as indicated by Ana:

...like the face 'cos you can't really see the eyes, nose mouth maybe like the profile...

Since a cut-out puppet with moveable mouth did not work, Ivan took this up as a challenge and here refers to the shadow of his mouth moving as he talks in profile as narrator in the opening scene:

The toughest decision, we're still making the decision, we have the narrator and since it's a shadow, we can use our faces and then put them in a profile so that we don't always need to cut out and move the mouth because it is a bit complicated, so we are still making the decision that, from what angle should we do it, so if we, should it be from a book, should the face read from a book maybe, should it kind of, er what do you call it, introduce itself or so like angle, from which angle, kind of more like this or something...

We gain a sense of how the pupils were considering the notion of narrator, and the relationship to audience, through using a shadow to show Ivan reading from a book and exploring a suitable angle for his face and his mouth opening. We also hear from Ivan that the pupils were considering how images and words, not only to be presented orally but as English subtitles to be added on the final film, could work together:

...cos he kind of talks with the audience, and if he does it from an angle that's a profile it will kind of look like he is talking to the characters, but it could work and maybe if we put, um, translator [subtitles] on top maybe then it will make more sense...

Settling for a shadow of Ivan's face in profile reading from a book is a further instance of finding solutions to problems that are effective and have a simplicity and directness rather than being technically elaborate. This principle was applied in other ways throughout the construction of the story. As an alternative to using a range of camera shots and numerous intricate edits, relatively long video-recorded segments of shadow puppetry were recorded in sequence from one angle with a single static camera without using the zoom control. While these recordings facilitated feedback and formative discussion, it was also found that making numerous takes should be avoided as the process of reviewing and selecting was time consuming and unmanageable. Pre-recorded sound effects from the internet were discarded in favour of sound effects made on the spot by experimenting with available resources in the classroom. As well as avoiding the technicalities of synchronising sounds from a variety of recordings, these 'spot effects' allowed sounds to relate in a nuanced way to the video recorded actions adding to their expressive quality. Finally, the translated Croatian speech presented as English subtitles overlaid the video.

Working across different modalities extended the range of resources and ways for retelling the story. The affordances of the materials, including the children's own bodies, became part of an assemblage through which different methods of communicating the story could be realised. Experimentation was encouraged and this was recognised by the children themselves ('We experimented a lot ...'). Consistent with this, rather than suggesting a pre-determined course of action, tentative language throughout the above extracts is apparent (e.g., '...but it could work and maybe if...');

‘...so we are still making the decision that...’; ‘...maybe we could put this scene or...’;
‘...then we’re thinking should we leave some words, or should we...’).

The experimentation involving readily available human and material resources was characterised by continual mutual intra-actions and, as with the use of ‘scene’, accords with Johri’s (2011) socio-material bricolage. Practice was socially and materially intertwined and arose in relation to an assemblage reflecting the demands of the printed text, the words used, the qualities of the shadow puppets along with other material as well as human resources. Moreover, in sociomaterial terms, the move away from pre-recorded sound effects to the use of spot effects can be regarded as an agential cut in that it opened the new possibility of non-verbal sounds conveying nuances in expression. Whilst in terms of agency this could be seen as a unilateral choice made by the children, Barad’s (2007: 140) notion of intra-actions moves beyond this to include ‘the larger material arrangement (i.e., set of material practices) that effects an agential cut between “subject” and “object”’. Similarly, how the narrator was represented in terms of the angle of Ivan’s face to allow the shadow of his mouth opening introduced a new perspective on the narrator and their relationship to an audience. More broadly, the notion of an agential cut could include the framing of images and editing that takes account of the combined environmental circumstances (Arlander 2018), or, as Holford (2018: 4239) suggests ‘As soon as we utter an articulation, we interpret (or produce a “cut”). Furthermore, dialogue can be viewed as ever-changing cuts or interpretations.’

Summary and concluding discussion

Digitally retelling and learning

The original printed text of Stribor’s Forest played a key role throughout the process of its digital retelling. It was continually interrogated in terms of what the pupils thought

was important to the narrative, sequence of events, and language used. This re-reading agenda, however, was not confined to the original text in isolation. Different adaptations provided ideas and qualities that contributed to understanding text as open to interpretation and what is drawn from it, rather than being fixed and finite, can be read and told in different ways. Fundamentally, this provides a precedent for freedoms in expression where adaptation is experienced as a dominant discourse (Berger and Zezulkova 2016). Although open to interpretation, the text of the story nevertheless provided continuity and connected the different actions through which the retold narrative was generated.

Scope for interpretation of the text allowed room for creative expression. Retelling a tale became a creative rather than a copying endeavour, and working across older and newer forms of Croatian as well as English moved the activity away from a rigid form of transliteration. The language and vocabulary comprising the printed text introduced linguistic considerations. Subtleties in choice of words reflecting cultural innuendos, poetic form, ways of articulating structure in terms of content ('scenes') and style of presentation (narration or direct speech) emerged. Rather than being confined to repetition, adaptation offered scope for re-creation at all levels. Such re-creation ranged from how the characters were presented and acted out, to planning, scripting and producing a coherent larger-scale digitally recorded work. These aspects of retelling introduced challenges and problems that had to be solved and, in turn, extensive discussion involving different layers of intellectual activity and criticality. Ana's comment in her reflective journal is a reminder of this: 'What I found most challenging was combining all our ideas because, somebody didn't agree with my idea or other way around, we coped with problems by talking and discussing with each other.'

Instrumental within this engagement were the storyboard sheets, the notion of a scene

which provided a basis for articulation and, rather than the sole end product being a live performance of a shadow play, the digital recording enabled what emerged at various stages to be easily reviewed and adjusted in its own right as a digital story.

Social and material encounters when digital retelling

The pupils working together, voicing and trying out their ideas gave scope for dialogic interactions where meanings could be generated, they were not subordinated in relation to their teachers; each voice had an equal status (Bakhtin 1986). Instances of exploratory talk (Wegerif and Mercer 1997) were recounted, the children listened to each other and responded to each other's suggestions with evidence of these being tried out. The purposeful nature of the activity contributed to a sustained dialogue (Alexander 2008: 112) where ideas were built upon and linked into 'coherent lines of thinking and enquiry'. What emerged from dialogue could be seen in terms of meanings and understandings that were continually negotiated.

That retelling the story as a knowledge-laden artefact to be produced could drive collaboration is in keeping with the dialogical approach articulated by Paavola and Hakkarainen (2014). From this perspective the technology and other shared objects would have a mediating role in transforming activities and practices (Paavola et al. 2012) and support collaborative work (Paavola and Hakkarainen 2014). Here, however, a distinction remains between human and material entities in terms of agency. In the activities reported, material resources including the printed story text appeared central to the dialogue. From a sociomaterial perspective, this could be cast as an intra-action involving the participants' words and actions where the technology, the existing and created texts and other material objects and their affordances were party to the retelling, with an agentic quality arising from their relationship. From decentring human

knowledge and agency (Kuby 2019; Hetherington and Wegerif 2018) the affordances and constraints of the printed text, setting and other material entities in relation with the human participants played a role in the intentions, knowledge and learning that emerged. This moves towards Fenwick's (2015: 91) notion of participation where 'learning and knowing in sociomaterial perspectives are enactments, not simply mental activity or received knowledge'. Knowledge arose from human-material intra-actions (Barad 2007). In this context the experimentation referred to can be seen as an extended relationship between the children, the printed text and material resources to hand.

Another quality of the intra-action was the distributed nature of the skills involved (Fenwick 2015). When digitally retelling, no one player retained a lead or overriding set of skills that determined in advance the detail on where the activity would lead. In turn, agency could be seen as dynamic and distributed; rather than being predetermined from a single source; the mode of expression that emerged through images, sounds and words was formed from the relationships amongst what was available and to hand.

Experimentation with shadows and sounds together with convenient notation (e.g., 'scene') and use of storyboard sheets allowing discussion on how the story could be segmented and sequenced contributed to the ongoing improvisatory nature of activity characterised by Gourlay and Oliver (2014). In terms of Johri's (2011) socio-material bricolage, the improvisatory quality of the intra-actions contributed to the way that the story evolved. Solutions to the problems and challenges presented were direct and effective rather than elaborate. Importantly, rather than limiting what was produced, practical or technical economy afforded enhancements in terms of freedom and nuances of expression.

Dialogue was integrated as an important part of this creative improvisatory and collaborative activity towards an output which in turn was reflexive and allowed room for, and drove dialogue. Whilst intention towards an output sustains intra-actions, this does not determine what the final output will be or the path that will lead to this. Here, ‘intention’ is not seen as an entirely human phenomenon but arises from ongoing human-non-human intra-actions. As different planes of human and non-human intersection arise, spaces are created which allow room for further dialogue and intra-action where the trajectory of activity is determined by the nature of those spaces.

While the reported work is small in scale and its generalisability limited, it nevertheless offers a detailed examination of the role of an existing printed story and its materiality along with other resources involved in its retelling. Further exploration of the issues that emerge with other literatures, longer texts and other groups of participants would extend this usefully. However, digital adaptations of well-known stories by children is a relatively unexplored topic and the reported work suggests that the process of digital retelling brings a distinctive layer of activity into a material and discursive relationship that allows important insights and experiences that contribute to learning and development.

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Conflict of interest

The authors have no conflict of interest to declare.

Disclosure statement

No potential conflict of interest was reported by the authors.

References

- Alexander, B. 2017. *The New Digital Storytelling: Creating Narratives with New Media*. Santa Barbara: Praeger.
- Alexander, R. J. 2008. *Towards Dialogic Teaching: Rethinking Classroom Talk*. 4th ed. York: Dialogos.
- Arlander, A. 2018. "Agential cuts and performance as research." In *Performance as Research: Knowledge, Methods, Impact*, edited by A. Arlander, B. Barton, M. Dreyer-Lude and B. Spatz, 133-151. Abingdon: Routledge.
- Axelsson, E. L. and Horst, J. S. 2014. "Contextual repetition facilitates word learning via fast mapping." *Acta Psychologica* 152: 95-99. doi:10.1016/j.actpsy.2014.08.002.
- Bakhtin, M. 1986. *Speech Genres and Other Late Essays*. Translated by V. W. McGee. Austin: University of Texas Press.
- Bandura, A. 2001. "Social Cognitive Theory: An Agentic Perspective." *Annual Review of Psychology* (52) 1: 1-26. doi:10.1146/annurev.psych.52.1.1.
- Barad, K. 2003. "Posthumanist performativity: Toward an understanding of how matter comes to matter." *Signs* (28) 3: 801-831. doi:10.1086/345321.
- Barad, K. 2007. *Meeting the Universe Half-Way: Quantum Physics and the Entanglement of Matter and Meaning*. Durham, NC: Duke University Press.
- Baroutsis, A. 2018. "Sociomaterial assemblages, entanglements and text production: Mapping pedagogic practices using time-lapse photography." *Journal of Early Childhood Literacy*. Advance online publication. doi:10.1177/1468798418784128.
- Bavdaz, A. 2018. "Past and Recent Conceptualisations of Sociomateriality and its Features: Review." *Athens Journal of Social Sciences* (5) 1: 51-78. doi:10.30958/ajss.5-1-3.
- Bennett, J. 2010. *Vibrant Matter: A Political Ecology of Things*. Durham, NC: Duke University Press.

- Berger, R. and Zezulakova, M. 2018. "A remaking pedagogy: adaptation and archetypes in the child's multimodal reading and writing." *Education 3-13* (46) 1: pp. 64-75.
doi:10.1080/03004279.2016.1178316.
- Brlić-Mažuranić, I. 1916. *Priče iz davnine*. Zagreb: Matica hrvatska.
- Cohen, L, Manion, L. and Morrison, K. 2007. *Research Methods in Education*. Abingdon: Routledge.
- Engeström, Y. 1999. "Activity Theory and Individual and Social Transformation." In *Perspectives on Activity Theory*, edited by Y. Engeström, R. Miettinen, and R. Punamaki, 19-38. Cambridge: Cambridge University Press.
- Erickson F 1986. "Qualitative methods in research on teaching." In *Handbook of research on teaching*. 3rd ed., edited by M. C. Wittrock, 119-161. New York: Macmillan.
- Fenwick, T. 2015. "Sociomateriality and Learning: a critical approach." In *The Sage Handbook of Learning*, edited by D. Scott and E. Hargreaves, 83-94. London: Sage.
- Fenwick, T., Edwards, R. and Sawchuk, P. 2011. *Emerging Approaches to Educational Research: tracing the sociomaterial*. London: Routledge.
- Gourlay, L. and Oliver, M. 2014. "Why it's not all about the learner: a sociomaterial account of students' digital literacy practices." In *Proceedings of the 9th International Conference on Networked Learning*, edited by S. Bayne, C. Jones, M. de Laat, T. Ryberg and C. Sinclair, 145-152. Edinburgh: University of Edinburgh.
- Hamilton, M., and Weiss, M 2005. *Children tell stories: Teaching and using storytelling in the classroom*. New York: Richard Owen.
- Hartley, J. 2004. "Case study research", in *Essential guide to qualitative methods in organizational research*, edited by C. Cassell and G. Symon, 323-333. London: Sage.
- Herman, D. 2009. *Basic Elements of Narrative*. Chichester: Wiley-Blackwell.
- Hetherington, L. and Wegerif, R. 2018. "Developing a material-dialogic approach to pedagogy to guide science teacher education." *Journal of Education for Teaching* (44) 1: 27-43.
doi:10.1080/02607476.2018.1422611.

- Holford, W. D. 2018. "Knowledge flows in the form of entanglement and 'cuts': an agential realist perspective on knowledge construction phenomena within an aircraft manufacturing workplace." In *Proceedings of the 51st Hawaii International Conference on System Sciences*, 4233-4242. Hilton Waikoloa Village.
- Hollan, J., Hutchins, E. and Kirsh, D. 2000. "Distributed Cognition: Toward a New Foundation for Human-Computer Interaction Research." *ACM Transactions on Computer-Human Interaction* (7) 2: 174-196.
- Hutchins, E. 1995. *Cognition in the Wild*. Cambridge, MA: MIT Press.
- Jessel, J. 2016. "Technology, culture and cognition: dialogic and critical approaches." In *Multilingual Digital Storytelling: Engaging creatively and critically with literacy*, edited by J. Anderson and V. Macleroy, 42-67. London: Routledge.
- Johri, A. 2011. "The socio-materiality of learning practices and implications for the field of learning technology." *Research in Learning Technology* (19) 3: 207-217.
doi:10.3402/rlt.v19i3.17110.
- Kaderavek, J. and Justice, L. M. 2002. "Shared storybook reading as an intervention context: Practices and potential pitfalls." *American Journal of Speech-Language Pathology*, (11) 4: 395-406. doi:10.1044/1058-0360(2002/043).
- Kuby, C. R. 2019. "(Re)Thinking and (Re)Imagining Social(ing) With a More-Than-Human Ontology Given the Limits of (Re)(Con)Straining Language." *Cultural Studies ↔ Critical Methodologies*, (19) 2: 126–143. doi:10.1177/1532708618807258.
- Lambert, J. 2002. *Digital storytelling: Capturing lives, creating community*. Berkeley, CA: Digital Diner Press.
- Latour, B. 2005. *Reassembling the Social: An Introduction to Actor-Network-Theory*. Oxford: Oxford University Press.
- Leonardi, P. M. 2012. "Materiality, sociomateriality and socio-technical systems: What do these terms mean? How are they related? Do we need them?" In *Materiality and Organizing: Social Interaction in a Technological World*, edited by P. M. Leonardi, B. A. Nardi and J. Kallinikos, 25-48. Oxford: Oxford University Press.

- Levi-Strauss, C. 1966. *The Savage Mind*. London: Weidenfeld and Nicolson.
- Merriam, S. B. 2009. *Qualitative research: A guide to design and implementation*. 2nd ed. San Francisco, CA: Jossey-Bass.
- Miles, M. B., and Huberman, A. M. 1994. *Qualitative data analysis: An expanded source book*. 2nd ed. Thousand Oaks, CA: Sage.
- Mills, J., Harrison, H., Franklin, R., and Birks, M. 2017. "Case study research: foundations and methodological orientations." *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research*, (18) 1: 1-17. doi:10.17169/fqs-18.1.2655.
- Monaco, J. 2009. *How to Read a Film: Movies, Media, and Beyond*. 4th ed. Oxford: Oxford University Press.
- Newby, P. 2014. *Research methods for Education*. Harlow: Pearson Education.
- Orlikowski, W. J. 2000. "Using technology and constituting services: A practice lens for studying technology in organizations." *Organization science*, (11) 4: 404-428. doi:10.1287/orsc.11.4.404.14600.
- Orlikowski, W. J. 2007. "Sociomaterial practices: Exploring technology at work." *Organization Studies*, (28) 9: 1435-1448. doi:10.1177/0170840607081138.
- Paavola, S. and Hakkarainen, K. 2014. "Triological Approach for Knowledge Creation." In *Knowledge Creation in Education*, edited by S-C. Tan, H-J. So and J. Yeo, 53-73. Singapore: Springer.
- Paavola, S., Engeström, R., and Hakkarainen, K. 2012. "The triological approach as a new form of mediation." In *Collaborative Knowledge Creation: Practices, Tools, Concepts*, edited by A. Moen, A. Morch and S. Paavola, 1-14. S. Rotterdam: Sense Publishers.
- Pea, R. D. 1993. "Practices of distributed intelligence and designs for education." In *Distributed cognitions: Psychological and educational considerations*, edited by G. Salomon, 47-87. New York: Cambridge University Press.
- Piaget, J. 1936. *Origins of intelligence in the child*. London: Routledge and Kegan Paul.
- Piaget, J. 1957. *Construction of reality in the child*. London: Routledge and Kegan Paul.

- Piaget, J. 1964. "Development and learning." *Journal of Research in Science Teaching*, (2) 3: 176-186. doi:10.1002/tea.3660020306.
- Rosenberg, John P. and Yates, Patsy M. 2007. "Schematic representation of case study research designs." *Journal of Advanced Nursing*, (60) 4: 447-452. doi:10.1111/j.1365-2648.2007.04385.x.
- Schoon, I. 2018. *Conceptualising Learner Agency: A Socio-Ecological Developmental Approach*, Research Paper 64, Centre for Learning and Life Chances in Knowledge Economies and Societies (LLAKES), London: University College London.
- Stephens, J. and McCallum, R. 1998. *Retelling stories, framing culture: traditional story and metanarratives in children's literature*. New York: Garland Publishing.
- Thomas, E. E., and Stornaiuolo, A. 2016. "Restorying the self: Bending toward Textual Justice." *Harvard Educational Review*, (86) 3: 313-38. doi:10.17763/1943-5045-86.3.313.
- van Lier, L. 2008. "Agency in the Classroom." In *Sociocultural Theory and the Teaching of Second Languages*, edited by J. P. Lantolf, and M. E. Poehner, 163-186. London: Equinox.
- Vygotsky, L. S. 1962. *Thought and language*. Cambridge, MA: MIT Press.
- Vygotsky, L. S. 1978. *Mind in society*. Cambridge, MA: Harvard University Press.
- Wegerif, R. and Mercer, N. 1997. "A Dialogical Framework for Investigating Talk." In *Computers and Talk in the Primary Classroom*, edited by R. Wegerif. and P. Scrimshaw, 49-65. Clevedon: Multilingual Matters.
- Wood, D. and O'Malley, C. 1996. "Collaborative learning between peers: An overview." *Educational Psychology in Practice*, (11) 4: 4-9. doi:10.1080/0266736960110402.
- Yin, R. K. 2014. *Case study research: Design and methods*. Los Angeles: Sage.

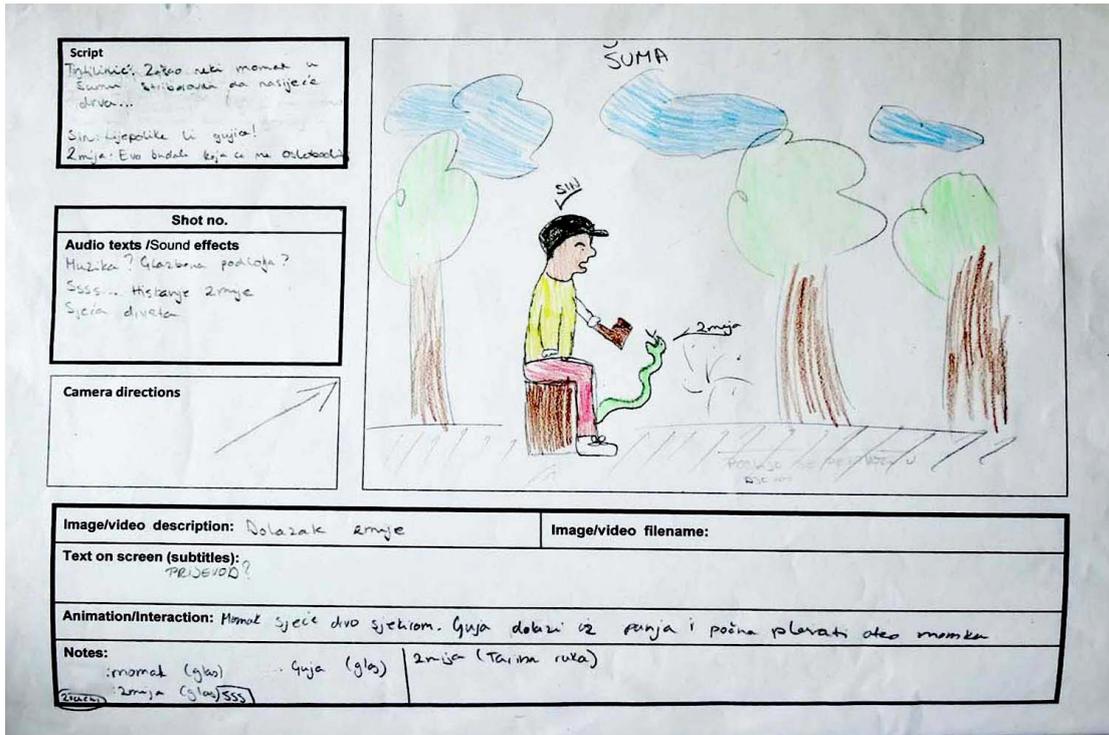


Figure 1. Example of a storyboard sheet used in making the digital version of Stribor's Forest.

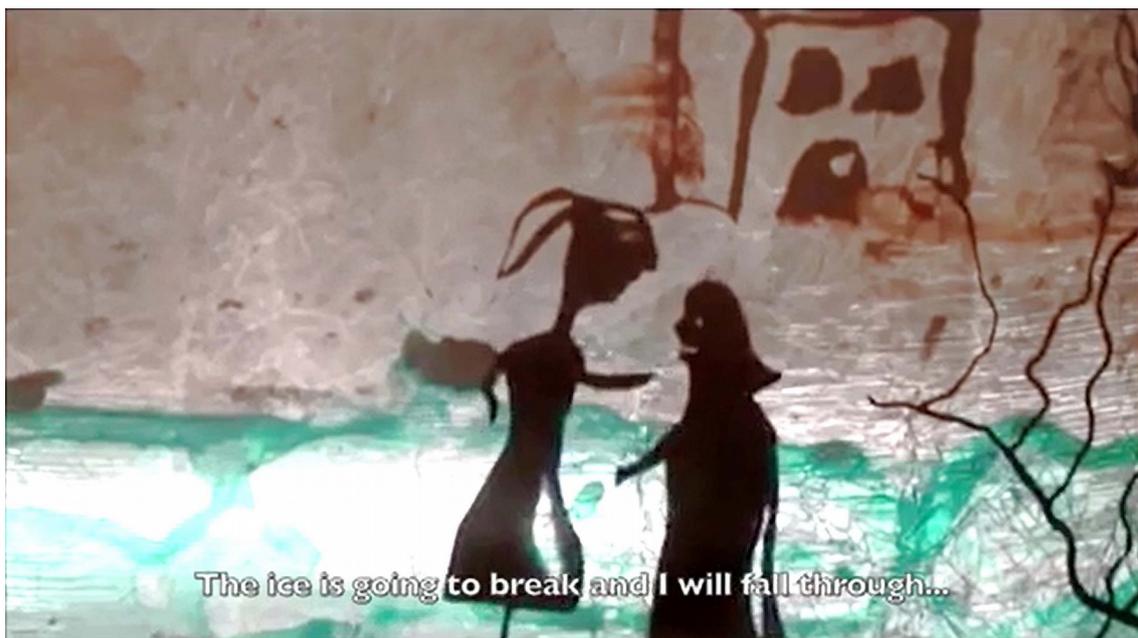


Figure 2. Shadow puppets and background used in the lake scene.