

## Article

# Young Pupils' Joint Creation of Multimodal Fairy Tales Using Analogue and Digital Resources

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**Abstract:** The present study aimed to explore 'what's happening' and 'what's possible', when young pupils jointly create multimodal texts in small groups. This was achieved by studying the process when pupils in a grade 2 classroom (i) created handwritten fairy tales, (ii) drew images, and then, (iii) transformed them into animated multimodal texts using a digital application during three small-group activities. Data comprises video recordings, pupils' multimodal texts (writing and drawings), teaching materials, and lesson plans. This qualitative case study focuses on one group of three pupils aged 8–9. The study is theoretically grounded in the designs for learning perspective, with the Learning Design Sequence Model utilized as an analytical tool. The teacher's design for learning—including her planned activities and the resources made available to the pupils—appeared to have a major impact on what happens and what becomes possible for the pupils in their design for learning. The teacher's design also influenced what competencies the pupils could (and chose) to draw upon in the different activities. An important result was that the pupils positioned themselves and each other in quite different ways during the small-group activities, which partly could be explained by the different affordances of the resources provided, as well as the teacher's design. The detailed descriptions of how the pupils' positioning changed in relation to the teacher's design for learning and the available resources add valuable knowledge to the field of educational research.



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**Keywords:** design for learning; learning design sequence model; positioning; primary pupils; multimodal text creation; digital tools

## 1. Introduction

The use of computers and other digital tools, such as smartphones, tablets, and game consoles, is rapidly becoming a reality in early childhood educational settings [1,2] and the early years of schooling [3,4]. In parallel, the role of digital tools in schools is discussed in society. In Sweden, the context of the present study, there is an ongoing shift from a very positive view to a more negative one concerning the use of digital resources in schools, particularly for young children (e.g., [5]). However, the important question still appears to be how digital tools and digital resources can be integrated into educational practices [6,7] to support and enhance children's meaning-making as well as their opportunities for participation in learning activities. Therefore, this article explores the process when pupils create multimodal texts in small groups with the aim of producing a digital animation. In this case, this was achieved by asking the children to create fairy tales, using paper, pencils, and crayons, and, finally, to animate the fairy tale using a digital tool. The overarching aim is to investigate how the teacher's design for learning, e.g., in terms of tools provided for the pupils, may impact what competencies the pupils can draw upon in their joint work and interaction. Thereby, this study can add important knowledge to the field of education, where research about young children's digital text creation is scarce. Our aims

align with Halverson's [8] proposal for a shift in research perspectives on using digital tools in teaching and learning, from being focused on 'what works' to giving attention to 'what's happening' and 'what's possible'. Through such a shift, more focus can be placed on the process when pupils use digital resources, their participation in the activities, and their meaning-making during their joint creation, rather than on examining what is easily measured.

Today, we live in a text-based society in a multimodal sense, where the understanding of the text concept has been extended from focusing only on written text to also include other semiotic modes, such as still and moving images and sound. The digitized media landscape has brought new possibilities regarding multimodal text design and text production and, consequently, other types of text cultures have emerged [9,10]. Thus, to be able to select the most functional ways of representing ideas or interacting is an essential skill for today's citizens [11,12]. Research has shown that active forms of learning take place in digital communities where children learn to communicate, produce digital content, share, distribute knowledge, and construct identities [13,14]. However, research has also shown that children's previous learning experiences related to their digital communities seldom is acknowledged or built upon in schools [15,16]. Furthermore, children have been reported to experience disconnections and blocked pathways between their digital competencies and what the school offers to them [16,17]. This is problematic since schools are the dominant educational institutions in our contemporary societies, and, consequently, schools determine what constitutes, defines, and frames learning [18]. Today, new formal demands on schools to provide conditions for pupils to develop digital competence and the ability to use digital tools, e.g., tablets with learning resources (e.g., [19]), have evolved. In Sweden, the use of such tools and learning resources is supposed to be a natural part of educational practices [20], even though the use of digital tools is under debate (see above). However, as mentioned above, disconnections have been identified between the status of children's actual learning experiences, between sites of learning, and what learning pathways schools offer them [16,21].

### *1.1. Children and the Digitized Media Landscape*

Due to the continued digitalization, children's communicational landscape has become more complex by affording more pathways to interaction and communication [22,23]. Through everyday participation, children develop repertoires that include multiple genres and forms of literacies that they draw upon to communicate appropriately in situated interactions in different digital playgrounds [2,24]. Research has shown that children regulate their actions to adapt them to the individuals that they are playing and interacting with [25,26]. These findings indicate that children develop not only repertoires that include multiple genres and forms of literacies but also repertoires for socializing in a hybrid modernity where the boundaries between the physical and digital worlds are erased. Research also indicates that children's play in a hybrid reality nourishes the development of 'soft' skills related to interaction, content creation, and consumption, skills defined as necessary for citizens in a digitized society [27]. Yet, playing in a hybrid reality also requires participants to use 'hard' skills, such as the ability to perform, for example, technical and operational tasks, and the ability to retrieve information and navigate digital contexts [27]. It is not easy, nor a goal in and of itself, to develop 'soft' and 'hard' skills; these abilities are by-products of participating in hybrid play activities and navigating the digitized media landscape [28].

### *1.2. Young Children's Multimodal Text Creation with Digital Tools*

Young children of today create multimodal texts using digital tools both in and out of school. Previous research, focusing on the characteristics of pupil-created texts, has shown that, when allowed to do so, pupils draw on their out-of-school experiences with digital tools, for instance when choosing images for their texts [29,30]. In classrooms where the function of digital texts has been explicit, studies indicate that the pupils have

a high level of engagement [31,32] and use each other as resources during digital text work [32,33]. Focusing primarily on evaluation practices, Sørensen and Levinsen [32] report on a Danish intervention project where pupils in grade 1 remediated a well-known fairy tale into a movie that they filmed with their tablets and in which they were the actors. The explicit purpose for the pupils was to create a film intended for pupils in grade 5. Through the working process, the pupils were engaged in both planned and spontaneous peer response, focusing on aspects such as whether someone else would be able to ‘tell what’s going on’ or figure out who is who, which were criteria that the teacher and the pupils had collaboratively suggested. In a study performed in a primary science classroom, focusing on the particle model of matter, the pupils created multimodal texts (as a first step, paper-based texts, and finally, a digital animation) to describe and explain the science phenomenon. These texts served as a basis for new activities and discussions about the content. In their final, digital, animations, the pupils demonstrated a high level of content knowledge in an area identified as challenging [34].

Additionally, in studies performed outside the school context, it has been shown that when children create digital, multimodal texts together, they negotiate with each other. During these negotiations, they act as subjects and manifest their views in various ways, for example, by performing actions, formulating certain pieces of information, and mastering certain skills [9,24,26]. An aspect of importance for the future of education is that participation in hybrid play practices appears to support children in maintaining effort and interest over time, despite failures and setbacks [27]. Several studies show how children through participation in digital play practices develop strategies for both learning and showing others how something is done. Such strategies appear to have implications on other contexts when it comes to, for example, formulating questions and answering them, distinguishing between contextual cues of importance, and imitating and showing how something is done [35,36].

### *1.3. Teachers’ Design for Learning*

In response to the changing profile and needs of learners in a digital age, pedagogic shifts are required. One such shift is the evolving role of teachers, from the authority of knowledge to designers for learning [37]. This aligns with the ‘designs for learning’ perspective [38–40] adopted in the present study (see Sections 2 and 3, below). Research suggests that teachers, in order to transform their pedagogies and practices, should design new learning ecologies where digital technologies are used to create contexts for multimodal learning in the 21st Century childhoods [12]. Another shift highlighted in the research is the necessity for teachers to draw on pupils’ funds of knowledge when designing innovative learning opportunities and encouraging creativity and critical thinking [41,42]. Findings highlight the importance of creating opportunities for pupils to generate their own representations and re-representations of concepts [42]. Suggestions along these lines are, for example, to connect with pupils’ lives by creating multiple texts, using creative writing, digital technologies, and drama pedagogy [43]. Thus, findings indicate that creative learning environments are characterized by access to a plurality of pedagogies and digital resources, teacher and pupil agency in open-ended dialogic environments, and collaborative learning with teachers, peers, and parents, supported by high teacher expectations [41]. In a study where the teacher’s primary focus was on introducing the software when giving instructions, a difference could be noted between the selection of design elements in the teacher’s orchestration of the digital resources and the pupils’ redesign of the task [44]. The pupils’ work developed towards visual design, with images being the central mode of expression in the process of creating commercials, in comparison with the linguistic design provided by the teacher (ibid).

### *1.4. Aim and Research Questions*

Previous research has largely either focused on “what works” [8] when students use digital tools, or on students’ work with digital text creation as such. In contrast to such

studies, with this qualitative case study, we aim to explore ‘what’s happening’ and ‘what’s possible’ when young pupils jointly create multimodal texts using a variety of tools as part of the process of creating their digital text. Therefore, we have analyzed a teaching and learning sequence comprising different activities where the pupils (i) jointly created hand-written fairy tales, (ii) made drawings to illustrate the fairy tale, and (iii) transformed these texts into multimodal, digital, texts by use of a digital application. The study is based on the following research questions:

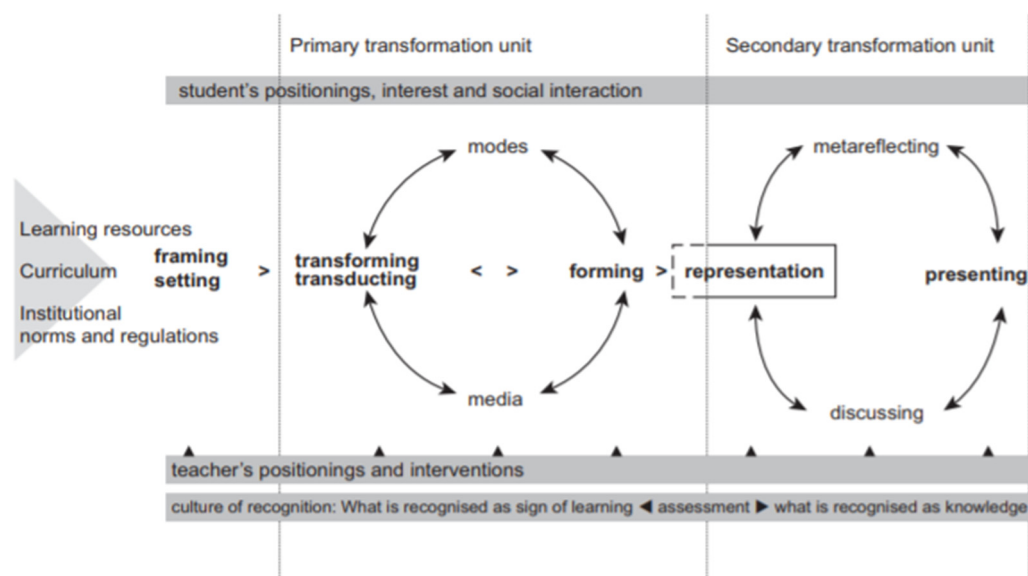
1. How is the teaching and learning sequence didactically designed by the teacher?
2. How are the available resources (e.g., concrete artifacts and learning resources provided through the teacher’s design) used by the pupils in the different activities?
3. What competencies do the pupils draw upon in the different activities and how does this affect their positioning?

## 2. Designs for Learning Theory and the Learning Design Sequence Model

To cater to the different resources used for interaction and the teacher’s design for learning, the present study is theoretically framed within a social semiotics perspective of multimodality [45,46] and designs for learning [38–40]. Within social semiotics, the social aspects of human interaction are emphasized, and the participants in the interaction are seen as sign makers who make choices among available semiotic resources, such as speech, gesture, writing, and image. Moreover, the participants’ choice of resources for meaning-making is viewed as a result of social, cultural, and situational factors, including participants and available semiotic modes and resources. A central concept in social semiotics is affordance [46,47], which we here define as the potential for meaning-making, or the potentials and limitations of the resources or semiotic modes used [46]. Thus, different modes can bring different aspects of a phenomenon into focus, thereby significantly influencing the meanings that might be made [48]. For example, images are described as particularly apt for showing spatial properties while verbal language is better suited for reasoning about, e.g., cause and consequence. Furthermore, different choices within a specific mode have different affordances depending on, for instance, content, culturally developed practices, and the participants involved in the interaction. When interacting and making meaning in classroom activities, content is often converted between semiotic modes. These conversions can be done within the same semiotic mode (transformation), for instance, if converting hand-made drawings into a digital application or from one mode to another (transduction), for instance converting a written text into a spoken narration.

From a multimodal perspective, interaction can be viewed as a form of design, where participants in the interaction make more or less conscious choices about what resources to use. Within the designs for learning perspective [38–40], teachers’ choices in a teaching and learning sequence are described in terms of designs *for* learning, while, in a similar vein, the pupils’ choices are described in terms of designs *in* learning. These choices can be planned, for instance when a teacher chooses to let pupils write a fairy tale with pencil and paper, or when a pupil chooses to add an image to the story. The choices can also be more unplanned, for instance, if the teacher makes certain gestures without planning to do so in advance, or when using an analogy that comes to the teacher’s mind as a way of concretizing something abstract. However, the selection and use of semiotic resources are seen as always being motivated, never arbitrary [49].

Within designs for learning, the learning design sequence (LDS) model (Figure 1) has been developed. It can be utilized both as an analytical tool and a tool for planning teaching and learning sequences of different lengths (e.g., one or more lessons in a teaching unit, or an activity within a lesson). The model includes three main parts, namely (i) framing and setting, (ii) the primary transformation unit, and (iii) the secondary transformation unit.



**Figure 1.** Learning Design Sequence Model (from [38], Figure 1.3., p. 4, used with permissions from the authors).

Teachers' overall design of teaching and learning activities relates to, for example, curriculum documents, institutional norms, and regulations. The norms may refer to norms developed at a national level, but also local norms developed at a specific school or in a specific classroom. These norms can be formal or informal rules regarding who is allowed to speak and when, or whether pupils are encouraged to take responsibility for their own learning from an early age. The teacher also has a purpose with the planned activities, such as developing the pupils' digital skills or knowledge about different text types. Depending on, for instance, the layout of the classroom, different resources are made available, and the teacher can decide what resources the pupils are supposed to use for a particular activity. Based on these premises (framing), the teacher makes choices for the learning design and introduces the activities, or in other words "sets the scene" (setting). During the primary transformation unit, the pupils engage in different activities during which they transform or transduce content through different representations (reading, listening, acting, speaking, writing, etc.) using the available resources. The primary transformation unit can result in a representation (e.g., a written or spoken text) intended to communicate the pupils' knowledge to others, such as the teacher, classmates, or someone outside the school context. During the secondary transformation unit, this representation and the previous learning activities can be the focus for meta-reflections between the teacher and the pupils.

This model presumes that the teacher continuously assesses the pupils' ongoing learning process. An important aspect here is cultures of recognition, that is, what counts as valid knowledge. Furthermore, the model considers that the teacher by, for instance, choosing activities, positions the pupils—and herself—in different ways, for instance as capable of taking responsibility for their learning. Likewise, the pupils position themselves, the teacher, and each other differently through their choices. The described model should be considered an ideal situation since not all teachers and students engage in meta-reflective activities (secondary transformation unit) at the end of a learning design sequence.

### 3. Methods

To study the process when pupils create and transform their own hand-written fairy tales and hand-drawn images into multimodal, digital, texts using a digital application, methods that could capture fine-tuned details of the pupils' actions and their interaction are needed. Therefore, video observation was chosen as the main method for collecting



empirical data. In the following, we describe the participants, the ethical considerations, the data collection, and the analytical methods applied in this qualitative case study [49].

### *3.1. Participants and Ethical Considerations*

The data was collected in a school in a small town in Sweden. The school is culturally and linguistically diverse, with approximately 50% of the pupils learning the language of instruction (Swedish) in parallel with the subject content. The teacher is an experienced primary school teacher specializing in teaching lower grades (from preschool to grade three). Data was collected in the teacher's second-grade class, consisting of 19 pupils (8–9 years of age) during a teaching and learning period of five lessons when the class worked with fairy tales. A purposive sampling of participants was applied since the goal was to strategically sample appropriate participants in relation to the research questions posed [50]. The teacher served as a gatekeeper in the study: she was previously known to be interested in designing lessons in line with the focus of the study and saw the study as an opportunity to develop her teaching practice.

The study adheres to the ethical considerations stated by the Swedish Research Council regarding informed consent, anonymity, and the right to withdraw participation from the study without giving a reason [51]. An information letter was formulated by the researchers and distributed by the teacher to the children's caregivers together with a consent form. The caregivers of ten pupils, five girls and five boys, consented to let their children participate in the study. When the participants in research projects are children, there is always a need for researchers to critically reflect on ethical issues during all stages of the research process [11,27]. To ensure consent from the pupils throughout the study, the researcher continuously asked them if they consented to be filmed before recording and was also responsive and paid particular attention both to the pupil's verbal and nonverbal communication to ensure genuine consent to participate.

All 19 pupils in the class performed the same activities, but data were only generated from the pupils for whom consent had been obtained. When video recordings of small-group work were made, the pupils from whom consent had been obtained stayed in the classroom while the rest went to a classroom next door.

In the present study, we use data from one pupil group, consisting of two girls and one boy. This group was selected since the pupils in the group were present throughout the series of lessons, that they communicated clearly about the task, and tried to solve several challenges. To maintain pupils' anonymity, they were given the fictitious names Lisa, Jenny, and Erik.

### *3.2. Data*

The teacher designed a total of five lessons for working with the creation of fairy tales. Lessons one and two consisted of whole-class activities in preparation for the pupils' text creation in small groups. During lessons three to five, the children created their texts. The first author was invited to follow the work during these lessons. The data consists of the teacher's lesson plans for the first two lessons, video recordings from the small-group work while creating texts during lessons three to five, and the pupils' multimodal texts (writing and drawings, both by hand and the different versions of the animated text) when working in small groups. During lessons three and four, video recordings were made using a tablet on a tripod, and the researcher moved between the groups. During lesson five, both tablets on a tripod and action cameras, placed on the pupils' foreheads with straps, were used. The tablet on the tripod faced the group during their group work, while the action cameras captured the perspectives of each of the pupils. In the present study, data from action cameras were primarily used as a check-up when there were uncertainties about what each of the children actually did in the animation activity.

### 3.3. Analytical Methods

The data was analyzed through the learning design sequence model (Figure 1), presented in Section 2, above. The analysis was performed regarding the teacher's design for learning and the pupils' design in learning. We regard all five lessons in the theme as one learning design sequence. Our presentation of the teacher's design for learning is therefore based on the design of all five lessons. The pupils' design in learning is based on the video recordings and texts collected from the chosen group during lessons three to five. The teacher's design for learning (RQ1) is analyzed concerning framing and setting in the LDS model (Figure 1) while the pupils' design in learning (RQ2) is analyzed in relation to the first transformation unit (Figure 1) concerning the resources used when creating their multimodal texts. The analysis of how the pupils were positioned by the teacher, and how they positioned themselves (RQ3) during the activities is based on (i) the teacher's overall design for learning, (ii) what is said in the classroom, and (iii) how the pupils used the resources provided, and on resources, such as gestures and interaction with the artifacts (e.g., papers, pencils, tablets) during the activities.

## 4. Results

The results are presented according to the analysis performed concerning the learning design sequence model described above (see Analytical Methods). First, the results regarding the first research question concerning the teacher's design for learning (framing and setting) are presented. Then, the results from the analysis concerning the second research question, i.e., the pupils' design in learning during the first transformation cycle follows. Finally, we present results concerning the third research question, that is, which competencies the pupils draw upon and how they positioned themselves in the various activities.

### 4.1. The Teacher's Design for Learning: Framing and Setting

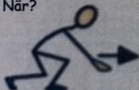


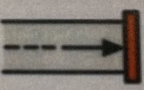
#### 4.1.1. Framing

As the participating school is culturally and linguistically diverse, a general decision was made that the teachers should make sure to include pictorial symbols in their teaching as a way of supporting the pupils' meaning-making and language learning (one example of this is shown in Figure 2). The activity of creating a fairy tale connects to the central content in the Swedish curriculum, which states that the pupils should be provided with strategies to write texts that are adapted to typical overall text structures and language choices, as well as to create texts where writing and image interact, both with and without digital tools [19]. Among the learning resources available, the teacher chose to let the children have access to artifacts such as papers, pencils, crayons, and tablets containing the application during the activities. Using the digital application, animations based on hand-made drawings can be made, and it is possible to combine the animation with spoken narration and sound effects. The teacher also provided the pupils with other resources, such as templates and inspiration for the content and structure of fairy tales (see Setting). Apart from these resources, the framing of the activities encouraged the pupils to use different semiotic modes, such as speech, writing, and still and moving images.

#### 4.1.2. Setting

After two classroom helpers had approached a large calendar to tell the date and the name of the day, the teacher introduced the schedule for the day, which was the normal routine in this classroom. During the lessons before the researcher was present, the teacher introduced the learning activity by letting the pupils listen to a fairy tale about an unhappy unicorn. She stopped this activity before the end of the fairy tale and introduced a writing template (Figure 2) for fairy tales, and the pupils were then asked to come up with their own endings in small groups. In that sense, her focus was on fairy tales and their prototypical structures. During the first lesson when the researcher was present (lesson 3), the teacher introduced the assignment to first create paper-based fairy tales and then transform them

into a digital application. The pupils were divided into small groups and the writing template, containing figures, words, and images (Figure 2), was distributed to the groups.




1	2	3	4
Vem? Var? När?  <b>Start</b>	Vad händer? Beskriv i ordning Först, sedan, därefter  <b>Hinder</b>	Finns det någon hjälpare? Hur löser man problemet?  <b>Lösning</b>	Hur slutar sagan? Till slut så Så levde...  <b>Slut</b>
Who? Where? When?  Start	What happens? Describe the order First, then, after that  Hindrance	Is there a helper? How is the problem solved?  Solution	How does the fairy tale end? Finally Then they lived... End

**Figure 2.** Writing template for fairy tales with translations.

The pupils were asked to draw images of the main characters in their tales and, if they did not want to use the backgrounds provided in the application, also of the background. On the Smartboard, the teacher also projected an image of a resource that could be used as inspiration and help for the pupils, through which they could decide, for instance, the identity of the main character(s) and an evil character, as well as a problem in the tale by tossing a dice (Figure 3).

As an introduction to the fifth lesson, when the pupils made their digital animations of their fairy tales, the teacher introduced the application, showing, for instance, how to take photos of drawn characters and to “cut” them out to be able to use them in the animation. She also told the pupils that the frame of the story needed to be small enough that the characters could be placed outside of it so that they would be invisible in the animation when in use. She showed how this was done through a multimodal orchestration, using her fingers on the tablet surface to illustrate how to resize the frame, while giving verbal instructions (Figure 4). She did this sitting on the floor with a tablet in her lap and the pupils sitting around her. The application is in English, so she translated words like “take a photo” and “save” into Swedish while going through the application step by step, again through multimodal orchestration, talking, and simultaneously showing the pupils what to do on the tablet. The pupils were told that when creating animations based on their drawings, they would work in the same groups as in the previous lessons and that they were supposed to make a spoken narration based on their written fairy tales.



	Vem/vilka handlar det om? (huvudperson)	Var? (miljö)	Problem?	Önd karaktär?	Hjälpare?	Magiska föremål?
	En prinsessa	I det stora slottet	Bortrövad	En elak häxa	En liten mus	Spegel
	En prins	I den mörka grottan	Vilse	En stor jätte	En grada	Trollstav
	En riddare	I en båt	Fattig	Ett stort troll	En enhörning	Ring

	Who are in the story? (main character)	Where? (setting)	Problem?	Evil character?	Helper?	Magic objects?
	A princess	In the big castle	Abducted	An evil witch	A little mouse	Mirror
	A prince	In the dark cave	Lost	A giant	A frog	Magic wand
	A knight	In a boat	Poor	A huge troll	A unicorn	Ring

Figure 3. Resource for inspiration with translations.



Figure 4. The teacher shows how to resize of the frame in the application (lesson 5).

#### 4.2. Pupils' Design in Learning—Primary Transformation Unit

The primary transformation unit comprised three activities performed in small groups: (i) writing a fairy tale with paper and pencil, (ii) making the drawings to be used in the animation, and, finally, (iii) transforming the fairy tale into a digital application. One lesson was used for each of these activities. As mentioned earlier, the pupils had access to a variety of resources during these activities: (i) the template and the inspiration for the content and structure of their fairy tales along with pencils and one sheet of paper to write the texts on, (ii) colored pencils for drawing images, (iii) their own paper-based fairy tales and drawings, and a tablet containing the application. Taken together, these activities and

resources encouraged the pupils to use speech, writing, and still and moving images in their creation of fairy tales. The group that the present study is focused on wrote their fairy tale without using the template or the inspiration provided by the teacher. Instead, they either transduced the ideas about the fairy tale that they discussed in words into writing, or the pupil in charge of the paper wrote down her own ideas. The pupils built the fairy tale sentence by sentence, rather than creating it from an overall idea about content or structure, as suggested by the template and the inspirational sheet provided by the teacher.

As a second step, parts of the fairy tale, such as the setting of the fairy tale (a forest) and the main characters (two children) were transduced into drawn images to be used in the animation (see Figures 5–7), with each child creating one image. Erik, who was drawing the main character, commented ‘How do you draw someone with chattering teeth?’ This comment reveals an experienced limitation in the affordance of image.

As a third step, the pupils transduced their fairy tale made in writing and drawings into a digital animation. They photographed their drawings using the tablets, and “cut” them out in the application to be able to move them while reading the story. They then read the written text aloud while moving the characters on the screen with their fingers, making sound effects by tapping their fingers on the desk (steps) or by using their voices (‘buh!’, ‘aaaah!’). A screenshot from the animation is shown in Figure 8. As is shown, the children have integrated their drawn characters into their own background (a dark forest).



**Figure 5.** Pupil’s drawings: the setting of the fairy tale.



**Figure 6.** Pupil’s drawing of Oscar, the main character in the fairy tale.



**Figure 7.** Pupil's drawing of Sara, the main character's friend in the fairy tale.



**Figure 8.** Screenshot from the pupils' animation.

When transducing the fairy tale into an animation, the pupils were very persistent in creating a “good” product. It appeared that “good” was a version in which the speaker's voice made the lowest number of deviations from the written version. This was evident when either the pupil reading the story stopped, exclaiming ‘no!’ simultaneously as she slapped her face in frustration, or when one of the others protested when the fairy tale was not read following the written version. This was also the case for details in the written version that could be considered less successful from the perspective of someone else viewing the animation, for instance, that the name of the main character was given in the middle of the story and not at the beginning. Additionally, a “good” version was one in which all the sound effects were present, and the characters were moving in the “right” way. For example, the pupils stopped the recordings a number of times, if the pupil responsible for tapping on the desk to illustrate a walking sound, forgot to do this. Thus, the criteria for a “good” version appeared to result from the pupils' joint negotiations in words, gestures, or actions during the process. All in all, this group recorded 20 versions of the animation before they were satisfied (the 19th version, which they were very happy with, was lost when they tried to save it on the tablet).

During the activities, the teacher circulated among the groups to check how the pupils were doing. Her interventions with the group focused on the form of reading and commenting on the fairy tale, supporting Erik when he read the text aloud, and to some extent, structuring the activities in the group. In line with the overall design of the series of lessons, in her comments on the fairy tale, she focused on the general content, particularly

the text structure. Once, she drew the pupils' attention to the fact that they had not included a hindrance and solution, which was central to the writing template (Figure 2). However, at the same time, she made sure to be supportive and to praise the pupils: 'you did not include a hindrance and a solution but that is fine, this is really a very exciting and good story'. The pupils, in turn, claimed that including a hindrance and a solution would actually have resulted in a 'very long' text.

#### 4.3. Pupils' Positioning

Overall, the teacher positioned the pupils as capable of solving the task independently in their groups. The pupils, however, positioned themselves differently during the three small-group activities. When beginning the small-group work, the pupils in this group placed themselves with Jenny and Lisa side by side on one side of the desk, with Erik on the opposite side of the desk. They soon took on different roles, positioning themselves in relation to each other. Lisa, who apparently had the highest reading and writing skills, took a leading role starting to write, using her pencil and the paper sheet that had been given to them by the teacher. Throughout the writing process, the pupil holding the paper (usually Lisa) was the one "in power", while the others took on subordinate roles, either as a supporter (Jenny) or as ones that made efforts to contribute (Erik, who was then positioned as a troublemaker by the girls). Their positioning during the activities was to a great extent evident in their body postures (such as in Figure 9 with Lisa confidently using the provided tools to write with Jenny and Erik watching), but also in the way they talked to each other, for instance by making demands.

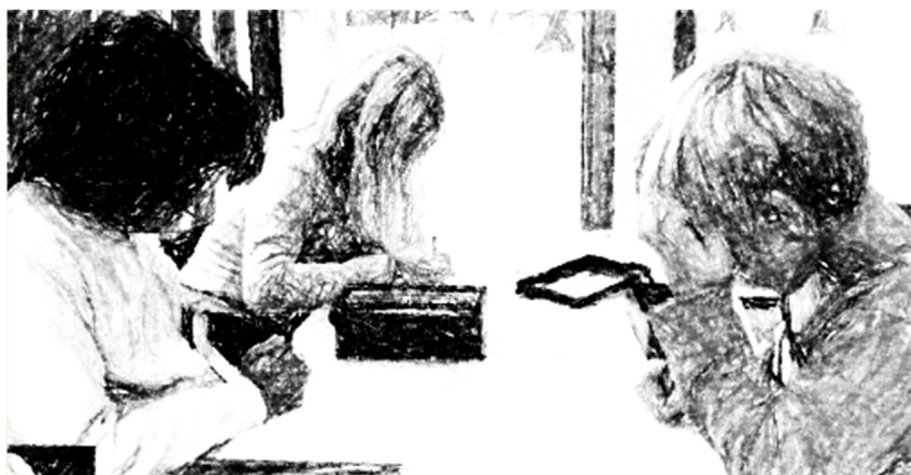


**Figure 9.** Writing a fairy tale. Lisa (placed on the left side of Jenny) taking the lead.

From time to time, Lisa invited Jenny into the writing process by handing her the paper and asking her if she wanted to write. Jenny accepted the invitation, but played down her own ability to contribute, excusing herself for not being 'a good writer' and also saying that it is 'hard to write with others'. Erik was never invited but tried to contribute to the fairy tale, for instance by suggesting 'a dark forest' instead of just 'a forest', contributing to a scary ambience in the fairy tale. This suggestion was taken up by Lisa, but in general, his efforts were ignored or explicitly rejected in words by Lisa and Jenny. However, he was insistent, at times trying to take the paper from Lisa and he held on tight to the writing template that they had been given by the teacher. As the teacher circulated among the groups giving feedback, she confirmed the positions already taken in the group, for instance when Erik tried to decode what Lisa had written and when moving the template from Erik to Lisa and Jenny after she had commented on the fact that the group had not included a hindrance in their story. Hence, the small power that Erik had by holding on to the template was taken away from him by the teacher, who was apparently unaware of his efforts.



When the group had finished writing the fairy tale during the following lesson, they were each given one piece of paper to draw the characters and the background. This changed their positions, and Erik took initiative and power by suggesting that Jenny could draw the trees in the forest. This idea was confirmed by the teacher: 'Yes, you will need a background'. Erik also said he wanted to draw one of the characters, Oscar. With these choices made, Lisa was the one to draw the other character, Sara. All pupils appeared to be content with their assigned tasks and they worked individually with great concentration (see Figure 10).



**Figure 10.** Making individual drawings.

When the pupils used the tablet to “cut out” their characters during the next lesson, whoever held the tablet was the one in power, while the others were waiting or, when Erik tried to cut out a character, making comments on how to do it. Erik grabbed the tablet when the teacher and the girls could not get the camera to work. After trying, he stated that ‘it does not work’. The teacher confirmed, ‘No it does not’ and she left to get a new tablet for the group.

During the animation activity, Erik and Jenny were more engaged compared to their engagement during the previous activities, now taking on different roles. Erik took the initiative and argued why the first recording was not good enough: ‘The boy needs to say aaaah!’ (Because he is frightened, similar to Erik’s wish to draw chattering teeth, above). He also suggested that they should make other sound effects, such as tapping slowly with the fingers on the table to illustrate the scary footsteps heard by the main character in the dark forest. These suggestions were immediately accepted by Lisa and Jenny. During this activity, Jenny did not wait to be invited to read, instead, she grabbed the paper and said: ‘I can read’, but soon gave up commenting that it was hard to read Lisa’s writing. Lisa again took a power position, for instance, as one who can decide whether the reading is good enough, e.g., by stating ‘This is not good’. Erik positioned himself in relation to Lisa’s reading skills. At one point he started to read, but only a few words, and then realized that this was not good enough, so he stopped and handed back the paper to Lisa. During this activity, it soon became clear to the pupils that it was good that all could contribute to the fairy tale in different ways. Figure 11 shows how Erik was responsible for moving the characters on the tablet, while Jenny made sound effects (tapping her fingers on the table) and Lisa read the story.



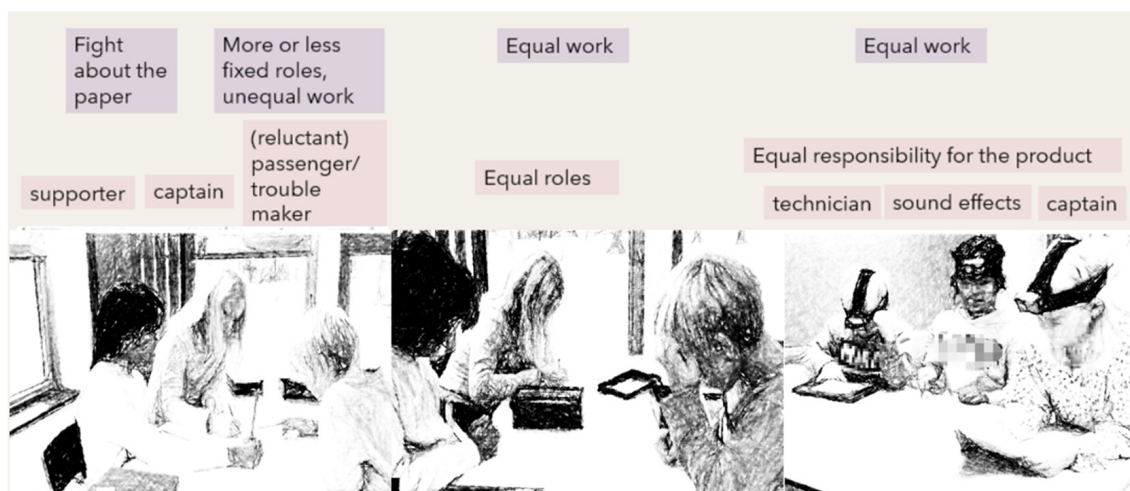


**Figure 11.** Joint creation of digital text.

As seen in Figure 11, the pupils have placed themselves on the same side of the table, side by side. Altogether, when engaging with the tablet to create the animation this seems to open up for the pupils to shift positions, since the task requires other kinds of skills than just reading and writing skills. Thus, the joint creation of a digital animation requires both “soft” skills (related to interaction and content creation) and “hard” skills (related to the ability to perform technical and operational tasks and navigate digital texts). Erik positioned himself as an expert on “hard” skills, after solving the problem when the tablet turned black, by expressing: ‘I am an expert on handling computers’. However, after many attempts and failures, Lisa took over all aspects of creating the animation: sound effects, moving characters, and reading. This resulted in a few more failures, though none of the pupils suggested a shift of roles. Even if Lisa took over towards the end of the process, the children continued to critically evaluate their versions and made adjustments in line with their negotiated criteria for what a good version of the animation should include.

## 5. Discussion

This study aimed to contribute to the field of education concerning “what’s happening” and “what’s possible” when young pupils jointly create multimodal texts by using various tools as part of the process of creating digital texts in school. This was done by studying the process when the pupils created paper-based fairy tales and then transformed them into multimodal, digital, texts using a digital application. This contrasts with previous research, which has focused either on ‘what works’ [8], or on pupils’ work with digital text creation as such [31,32]. Furthermore, in this study, we have analyzed what happens and what’s possible in different activities, where digital text creation is the final part of the process. As the above results reveal, the teacher’s design for learning—including her planned activities and the resources made available for the pupils—appears to have a major impact on what happened and what became possible for them in their design in learning. The teacher’s design also had an impact on what competencies the pupils could (and chose) to draw upon in the different activities, (i) writing a paper-based fairy tale, (ii) drawing images for the fairy tale, and (iii) transducing the fairy tale into the digital application. One result that stands out is the variety of ways that the pupils positioned themselves and each other concerning provided resources and required competencies during these three activities (see Figure 12). In the following, we discuss the design for and in learning based on this result and in relation to previous research.



**Figure 12.** Summary of the pupils' positioning during the three activities: writing a paper-based fairy tale (**left**), drawing images (**middle**), and creating a digital version of the fairy tale (**right**).

In the first activity, the teacher's design for learning included traditional school resources, such as pencils and papers, used in a learning activity where the outcome was quite clear from the beginning: a hand-written fairy tale. This may be the reason why during this activity the pupils positioned themselves and each other mainly based on their reading and writing skills. Lisa, who had the highest level of reading and writing skills, was "the captain". It was clear that she was the one in the position of holding the paper and thereby the one with power, while the others took subordinate roles, as a supporter (Jenny) and as a somewhat reluctant passenger (Erik). Hence, the fact that the pupils had only one sheet of paper limited their opportunity to work on equal terms. During this quite traditional design, the teacher took the role of an authority of knowledge, which, according to, e.g., Lim Fei [37] is a traditional role, which gives little room for the pupils' creativity and engagement. She took on this position when she presented the learning activity, when she introduced the learning resources, such as the writing template and the inspiration sheet for the content of the fairy tale, and when commenting on the group work. However, the group chose not to use the learning resources provided by the teacher. Furthermore, they showed no interest in evaluating and improving their fairy tale when the teacher commented on the lack of a hindrance in their fairy tale, probably due to the (limited) affordance of a hand-written text when it comes to making changes in the middle of an already written story.

A shift in the pupils' positioning could be noted in the second activity. Here, Erik, the previous "reluctant passenger", took the lead and told the others what to draw, and none of the others opposed his suggestions. The resources were distributed equally among the pupils: each had their own sheet of paper, but they shared crayons without any problems. During this activity, the pupils did equal work and assumed equal roles. They did not evaluate or comment on each other's drawings; instead, everyone was responsible for their own drawing. It seemed a silent agreement that they all expected each other to do their best. However, the affordance of image as a semiotic mode was a challenge for Erik, who wanted to add to a scary ambience in the fairy tale by illustrating chattering teeth, which he gave up on. In this activity, the teacher's role shifted from an authority of knowledge towards a designer of learning as she only told the pupils that they could use different resources in their animations, e.g., by drawing their own settings and characters or using resources built in the application. Hence, in her design for learning in this activity, she drew on the pupils' funds of knowledge, which, e.g., Hutchinson and colleagues [41] stress as important for encouraging pupils' creativity. Her shift from acting as an authority to a designer of learning aligns with previous research calling for a pedagogic shift, as discussed by Lim Fei [37].

The third activity stands out when it comes to the pupils' positioning. Although the reading and writing skills appeared central to gaining power over the animation process, the children took on partially new roles, with equal responsibility for the final product. While Lisa regained her role as captain, due to her reading skills, Erik took the role of the "technician" since he could draw on competencies other than his reading and writing skills. Hence, their out-of-school competencies had an impact on their positioning [15,16]. Erik was also able to contribute to the end product through his idea that sound effects would make the product better by adding a scary ambience to the fairy tale. Jenny was also able to take an active and important role as the one who made these sound effects, while Erik made sure that the characters were animated in line with the narration. The teacher, as in the previous activity, took the role of a designer of learning [37], with the exception that she showed how to use the application. Hutchinson and colleagues [41] highlight the importance of teachers drawing on the pupils' digital "funds of knowledge" when creating learning opportunities to enhance creativity and critical thinking. These findings are supported by the findings in this study; when the children were free to use their own ideas about how to design the final product and use their different competencies, this appeared to encourage their creativity.

In addition to using the resources provided—the digital application and the previously created paper-based fairy tale—the pupils used their own bodies and furniture to make the sound effects (tapping the desk, using voice for other effects). Hence, in designing their product, they used available resources that they found useful according to the affordance of the artifacts (e.g., the desk was used for creating scary steps by slowly tapping on it) and other resources (e.g., adding 'ahh!' with a high-pitched voice to illustrate that the main character was scared). The pupils used resources that they found useful, which aligns with, for instance, studies by Sørensen and Levinson [32] and Svärde Åberg [33] who showed that pupils use each other as resources during digital text creation. Furthermore, the three pupils mutually evaluated the different versions to agree on one version where they found that the animations of the characters, the sound effects, and the narration contributed to a high-quality product. These findings support previous studies [9,24,26] showing that when children create digital multimodal texts together, they negotiate with each other on how to proceed in their creative process. Thus, this study illustrates how the pupils act as subjects and express their views concerning how they master certain competencies and skills. It was particularly noticeable that the pupils showed a high level of engagement during the animation process, which is also in line with previous research [31,32]. Compared to their reluctance to include a problem during the first activity, there seemed to be no limits to how many versions of the digital version of the text they were prepared to make.

Even though the present study contributes with new and interesting findings, it has limitations, for instance concerning the small-scale nature of this case study, which involved a limited number of participants. Therefore, we cannot claim that the study is generalizable to other contexts. To make any broader claims, more studies from different contexts (other subjects, other student groups, etc.) would be needed. The research team behind this study is conducting several parallel studies in different subjects with similar teaching and learning designs, where pupils create digital animations as a final activity in teaching and learning sequences involving a variety of activities and learning resources. By designing such teaching and learning sequences, including both digital and other resources, it is possible to—just as in the present study—analyze how different activities and resources may impact pupils' possibilities both to make meaning about subject content and draw on their funds of knowledge, competencies, and previous experiences from both inside and outside of the school context.

## 6. Conclusions and Implications for Education

In conclusion, by exploring "what's happening" and "what's possible" by closely analyzing the process when pupils create multimodal texts, we could detect how the teacher shifted from an authority of knowledge to a designer in learning. This was reflected

in the teacher's didactic design, for example concerning the choice of activities and the kind of resources available to the pupils. Since the tools and semiotic modes used have different affordances, the didactic design had a clear impact on the pupils' possibilities to make meaning and to participate in the activities on equal terms. As mentioned, in Sweden, which is the context of the present study, there is an ongoing debate regarding the role of digital tools in education, in particular for young children. One risk, which has emerged in this debate, is that digital tools are positioned as either "good" or "bad". Yet, letting children use such tools has both possibilities and challenges. This study shows that the teacher's design for learning is of utmost importance regardless of the tools made available to the pupils. Our results reveal that the pupils' joint work with a digital tool contributed to a working process where they maintained engagement and interest over time when creating a digital text, despite some failures and adversities. Furthermore, when working with the digital tool, they could also use and further develop soft skills, such as collaboration, negotiation, and interaction. However, the fact that the teacher's design for learning included a variety of activities (e.g., writing by hand and drawing images) might have contributed to this positive outcome, as the group, more or less throughout the whole process, was engaged in creating their joint text, though with somewhat different levels of engagement, where the creation of the animation stood out.

An implication for education concerns the importance of teachers' didactic design, including resources made available for the pupils. In this study, the teacher's design for learning had a clear impact on pupils' positioning and engagement, where we noted that they took on different roles and they contributed with different competencies during the various activities, which to some extent appear to be dependent on the affordance of the tools and other resources that were available.

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