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Edited by
Nadia Mana
Fondazione Bruno Kessler, Trento, Italy

Ornella Mich
Fondazione Bruno Kessler, Trento, Italy

Antonella De Angeli
University of Trento, Italy

Allison Druin
University of Maryland, USA
INTRODUCTION

Nadia Mana\(^1\), Ornella Mich\(^1\), Antonella De Angelis\(^2\) and Allison Driun\(^3\)

\(^1\)Fondazione Bruno Kessler, Trento, Italy
\(^2\)University of Trento, Italy
\(^3\)University of Maryland, USA

Given the success of the first edition, the aim of this second workshop is to investigate further all those topics related to the design and implementation of interactive electronic books (e-books) for children. Researchers, teachers, pedagogues and industry people are invited to collaborate in framing the e-books design space. Another aim of this workshop is to create the context for trying to summarize the best of the works on this topic.

Once again, the workshop is mainly geared towards top researchers and practitioners working in the area of interactive e-books for children, which are particularly (but not exclusively) concerned with issues in designing, creating, using and evaluating this kind of books. In particular, we bring together researchers from a wide range of disciplines - HCI designers, computer scientists, technologists, linguists, educators, pedagogists, psychologists, graphic designers, editors - who work in interactive e-books for children or are interested in exploring the challenges of this domain. Our wish is to promote an interdisciplinary exchange collecting participants desiring to integrate different views and ideas, findings and experiences.

General topics discussed in this workshop are mainly related to:
- designing effective learning e-books
- designing for the abilities of children with special needs
- individualizing approaches and other methods to address individual differences
- applying theories to design and evaluation
- complying with regulations
- guidelines and standards.

More specifically, the workshop presentations are related to three main topics: e-books and learning, e-books and entertainment and e-books and special needs.

Following the success of the first such workshop last year, we wish to continue to build a community working on the proposed topics. In particular, this second edition of the workshop is an attempt to cement this emerging community.

The proposed workshop provides a venue to share the participants’ expertise in interactive e-books field and frame the design space of this kind of books, while addressing open questions, identifying emerging trends and challenges in this field, and exploring unified approaches.

From the submitted papers and the discussion during the workshop presentations we aim at:
- obtaining a good picture of the current technological solutions;
- identifying requirements and constraints to develop interactive e-books supporting the claimed benefits
- identifying novel design concepts that extend the boundaries of what interactive e-books can offer to children from the educational and entertainment viewpoint;
- outlining possible directions for future research in the field.

Finally, through a peer-to-peer review and a careful selection of submitted workshop papers, we aim to provide a suitable stage for discussion that will both push forward the state of the art and generate follow-up interest and ideas.
Part 1
Reading Skills and e-Books
ABSTRACT
Interactive E-books have been used as a motivational tool for children to read. With their interactive and playful feature, ebooks can engage, motivate, and provide an enjoyable reading experience. However, few studies have been performed to evaluate the ability of the interactive features in e-books to support the comprehension of the text. Most of these studies have compared the effectiveness of reading from interactive e-books to reading from printed books. There is also a limited research on the design of interactive e-books that support comprehension of the text. This paper reviews the literature on the effects of reading from interactive e-books on comprehension. It follows by proposing an interactive design technique that uses the “mise-en-scène” expression and explains how this type of interactivity could support comprehension of the reading. The use of “mise-en-scène” is explained further in the design of a reading application named Trees of Tales that promotes fun, engagement, and comprehension of text.

GENERAL TERMS
Design

KEYWORDS
Comprehension, Interactive Reading Application, Trees of Tales, Children e-books, Interactivity for Comprehension, “Mise-en-scène”.

1. INTRODUCTION
"E-books can provide an instant library – a library where we can easily weave and search through the texts." [15]. Obviously, the reading experience on the computer is different from reading a printed book. Researchers found in their survey that when book owners and non-book-owners were asked about their favourite reading material, both groups indicated that "technology-based materials dominate as reading choices" and that "text messages, emails, websites and reading on social networking sites" are mostly read by young people [3]. Additionally, having a computer at home can also contribute to reading achievement. Another research indicated that having a computer, a desk, books of one’s own, and access to newspapers and magazines, all have a significant relationship to reading attainment [2]. Although, there is an ongoing argument of whether it is a positive [11,12] or a negative [14] experience to read from the screen or even to use the e-readers such as the Kindle and the iPad. However, reading from the computer and from e-reader devices is becoming more commonplace.

Reading comprehension is the “essence of reading” and it is crucial to the development of reading skills and the development of the ability to obtain an education [6]. Reading comprehension has been defined as a highly active cognitive process that involves intentional and thoughtful interaction between the reader and the text to create meaning [13]. Interestingly, very few studies have been performed to evaluate the ability of the interactive features in e-books to support the comprehension of the text.

2. READING COMPREHENSION AND E-BOOKS
Since the introduction of e-books, researchers have investigated the effects of reading e-books on comprehension in comparison to printed books. Korat and Shamiir [9] found that children of ages 3 to 5 enjoy e-books and remember more of e-books content than the printed books. Another study [7] established that children who read from e-books performed better in comprehension test than those who read from printed books. However, other studies have found that interactive e-books do not support comprehension in comparison to printed books. De Jong and Bus [4] emphasised that printed books are more beneficial for learning than e-books. Another study by Steoelke [18] concluded that students performing on average academically achieved significantly worse in the e-book session and the special education students did not have significant differences between the e-book and the printed book reading sessions. It should be noted that the selected e-book for the study had limited interactive features such as ‘page turning’, page-by-page drop down menu, and an ability to zoom in [18]. Most of these studies assessed comprehension by comparing interactive e-books in general to printed books.

The most common methods that have been used to assess comprehension are the Post-test questions [7,8,10,18] and recently the eye-tracking technologies [19]. That could be due to the difficulty of selecting a suitable mean to measure reader’s comprehension [5]. Different types of interactivity in different e-books could have different effects on comprehension, such as offering multiple reading modes [17]. With the rapid development of technology, multiple e-book formats have become available. However, there are a few studies that concentrated on the interactive features in ebooks that support comprehension. A recent pilot study [10] found that one less animation activated by children in an e-book, the better the children understood and memorised the story. It is therefore important to determine how the different interactive features of e-books affect a child’s comprehension of the text. Ebook publishers and designers keep trying different approaches of using interactivity to enhance engagement as well as comprehension especially for children [14,16]. Thus, research on how interactivity can be used effectively is essential, as we need to move children away from interactive e-books that merely entertain children towards interactive e-books that educate them, whilst they entertain.

2.1 Interactivity in existing apps
Interactivity can play a significantly more important role than pure fun and enjoyment of the content. For example, interactivity could be used to ensure text comprehension, as those children should exhibit better reading skills than younger ones. A good example in this context is the iPad app series: Bartley’s Book of Buttons [3] by Monster Costume Inc. In this app, Bartley collects buttons by solving mysteries and the reader is the actual coinvestigator who helps the character to find his buttons. The pages are filled with images and buttons that can be pressed and moved according to the text to help Bartley on his journey. Only when the quest in every page is resolved, the main button will turn green indicating its ability to be pressed, which in turn allows the reader to move to the next page. The design suggests that this technique engages children and gives them the feeling that they are playing a game more than reading a story.

Another interesting example is The Treasure Kai and the Lost Gold of Shark Island® by Treasure Bound Books. This is an ebook of a game-based adventure story where the reader is in control of the storyline. By clicking the different treasure chests, new adventures advance the storyline. Although there is a sense of controlling the narrative of the story, the reader does not participate much in the adventures and there is limited interactivity with the main character. This kind of limited narrative control is more common in e-books for younger children. We have been finding that more control of narrative is more common in e-books for teenagers. Controlling the narrative can be engaging and helps to personalise the experience when reading the story.

A good e-book example for teenagers is the iPad app Brush of Truth® by StoryBayou. In this e-book the reader is given a choice of direction that affects the narrative to a point where the story sometimes ends with a failure to solve the mystery. In this situation, the teenager has to read and understand the text to make an informed decision to progress the story in a meaningful way. Although this method allows manipulation of the narrative of the story, it also encourages careful reading and therefore it can be assumed that this enhances comprehension of the given storyline.

3. AN INTERACTIVE TECHNIQUE
From the research on interactive storytelling application, we propose that Interacting by building the scene of a page in the story can become a part of children interactive storybooks. “Miseen-scene” is a French term meaning “place on stage,” and refers to all the visual elements of a theatrical production within the space provided by the stage itself, which essentially means visual theme or telling a story [1]. “Mise-en-scene” entails the set design including available props; the composition of the stage space; lighting; placement of characters etc.

The technique of setting the “mise-en-scene” is used in many storytelling applications where children act as the directors of the stories. It is hypothesized that less directional involvement motivates children to create stories in an interactive and fun way. One example of an application that uses “mise-en-scene” is the Toontastic® application by Launchpad Toys. This creative application for children allows the creating
and sharing of a cartoon. It also allows children to choose a setting, drag characters, and move each character while recording a dialogue. There are other applications that are created to help children develop stories and books such as the Book Creator® app by Red Jumper Studio. In this app, children can drag and drop pictures, text, and voice to create digital and printed books. These applications motivate children to create stories and share them with their friends. Some aspects of the interactivity that is used in Toontastic and Book Creator such as creating the scene be used in reading applications to allow for creativity and to enhance understanding of the text.

There are several positive aspects that come with using this technique of interactivity: children might take adjusting the scene as a quest that they need to achieve in order to produce a matching scene for the story. It may also be engaging and enjoyable to play and interact with the characters and create different versions of the storyline. In turn, using this technique can provide an assessment to measure a child’s understanding of the text. The designer of the interactive e-book can use the scene creation technique to build specific algorithms that connect the correct images of characters and objects to the different pages of the story. This will allow the software to evaluate whether children are setting the scene elements accurately, according to the text of the story, or inaccurately. If the child sets the scene correctly, feedback can be given, such as music and changing the colour of the Next Button from red to green, to motivate the child to keep reading and playing. If the colour of the Next Button does not change to green, the reader knows that she needs to figure out why it is not changing or what is wrong with the scene. In the following sections, we will use the design of a self-developed application, named Trees of Tales, to provide an example of how to integrate the “mise-en-scene” in a reading application for children.

4. MISE-EN-SCENE IN TREES OF TALES

Trees of Tales was carefully designed to be an engaging, motivating, and enjoyable reading experience. It aims at improving the reading habit amongst Arabic children. It is made enjoyable by adding interactive and playful elements that is part of the storyline and encourages comprehension of the text. Children first choose the character they are interested to read about from three existing characters; Joha, Sindbad, and Awaisha, see figure 1. When they tap on the character, they will be taken to the character’s tree. From the character’s tree, they can choose one of the stories that exist about that character. Those stories are branches in the character’s tree. Children can also create more stories about their favourite characters by tapping on the tree hole. For each story they create, a new branch appears in the tree, which will make the tree grow and flourish.

Next, the Next Button turns green and a jingle is played to indicate that children can proceed to the next page. The Next Button works similarly to the buttons in Bartley’s Book of Buttons as they change colour when children are successful in their attempts. In Trees of Tales the Next Button exists on every page but it does not turn green unless the “mise-en-scene” corresponds to the storyline. Figure 2 contains two screen shots of a story page in Trees of tales that illustrate the interaction to advance in the application.

When the next button turns green, children can press it to move to the next page or they can keep playing with the scene and add other images or arrange it differently until they are satisfied with the outcome. If they change a critical element that makes the scene contradict with the storyline, the green button will turn back to red indicating that there is something incorrect with the scene and next page will be locked again. However, children can easily change the images in the scene and add other images or rearrange the scene in a way that does not affect the storyline such as in figure 3.

In addition to the “mise-en-scene” ability, the application also allows children to create and produce several unique stories from the existing scene material. In the main menu, the children could share their stories and also read their friends’ creations. This functionality helps to maintain the interest of the young readers even after they have read all the base stories and ensure that there are new reading resources for children through the application. Originally, there are two branches in the tree indicating two different stories. When children create a new story, another branch is created in the tree and the tree grows vertically. Similar tools for managing the “mise-en-scene” in the storytelling part of the application are provided as well as a range of backgrounds, characters and objects that can be placed in the scene. Children can also add their own text and create as many pages as they require to tell the new story. The more stories the children create, the more branches appear in the character’s tree and the longer the tree grows. Currently, there is no limit on the number of stories that children can create in each tree, and they can scroll up and down the tree to see all the stories. Figure 4 shows the tree pages of different characters at different stages.

5. CONCLUSION

There is a lack of research on the design of children interactive ebooks that foster comprehension. In this paper we propose an interactive technique that, if used in e-books for children, it could increase their comprehension of the text. This interactive technique is based on allowing children to set the “mise-en-scene” of the story. The technique was explained further in the design of our reading application, Trees of Tales. We believe that using this technique does not only engage children to read but also supports their comprehension of the text. However, these are all claims until proven to be right or wrong. More research is required, to evaluate the effectiveness of using the “mise-en-scene” technique of interactivity in e-books for children. Trees of
Tales application will provide a good example for evaluating “mise-en-scene” effectiveness. The next step will involve testing the comprehension of two groups of children reading from two versions of the application; one with “mise-enscene” interactivity and one without it.

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7. REFERENCES

Serious Games or Playful Books? How Interactive eBooks can Better Support Leisure Reading

Luca Colombo
University of Lugano - USI
Via Buffi 13, 6900 Lugano, Switzerland
luca.colombo@usi.ch

Monica Landoni
University of Lugano - USI
Via Buffi 13, 6900 Lugano, Switzerland
monica.landoni@usi.ch

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1. INTRODUCTION

“What do you like and what do you not like in reading books?” We asked this question to a group of 9 to 11 years old children during a cooperative inquiry session at our research facility. We were in the early stage of a research project aimed at making eBooks “more engaging” and we wanted to gather their opinion on the matter. The answers children gave were simple and thought-provoking at the same time.

They said that what they like most in reading is the spur to imagination and the pleasure to discover they get from books (whether it is a new story or the meaning of a word they did not know). What they like less is when they read a book because they “have to” or when the book is “boring”. Children also pointed out the necessity for the age-appropriateness of the book: not too easy (or childish) and not too complex (with complex statements or too many unknown words). As one participant said: “I like books because they make your mind wander and no one can stop you or disturb you because you are daydreaming […] But it also depends on the books, some of them are really boring. I do not like books you have to read for school or those too complicated”.

These answers gave us a first clue on what children may like in interactive eBooks as “serious games” – which in some cases can be different from what adults think they may like – and challenged us to better understand children’s motivation for leisure reading and to ask ourselves the following questions:

• How can eBooks better support leisure reading and make the reading experience more engaging for children?
• Would it be better to design interactive eBooks as “serious games” (i.e. with an emphasis on gaming) or as “playful books” (i.e. with an emphasis on reading)?

Taking inspiration from these questions, in this paper we will present our reflections on eBooks and leisure reading. Starting from a brief review of the most important works on reading motivation, we will discuss how existing psychological theories may inspire new approaches to the design of children’s interactive eBooks that better support leisure reading (in this paper, with interactive eBooks we identify all those eBooks enriched with multimedia and interactive features).

2. READING MOTIVATION

Given the complexity of human mind, there are a variety of factors which may influence people’s reading behavior. According to Guthrie and Wigfield [8] reading motivation has a multifaceted nature and includes aspects such as intrinsic and extrinsic motivation, social motivation, goals for reading (e.g. knowledge acquisition, conceptual understanding) and self-efficacy (i.e. confidence in your own capabilities). Conceptually, intrinsic motivation is the process of choosing to do an activity for its own sake, with a full sense of volition. In contrast, extrinsic motivation means that the behavior is instrumental to some separable consequence, rather than being satisfying in its own right [5]. As for self-efficacy, research showed that providing clear goals for reading tasks and feedback on progress toward success increased people’s confidence in their own capabilities [8] and this may in turn increase the likelihood that people will engage in the reading activity [14] (we will come back on this later in Section 4.1).

Wigfield and his colleague Guthrie [8, 14] depicted children’s intrinsic motivation for reading as a multidimensional construct and identified three main dimensions relating to it. The first one is curiosity, namely the children’s desire to learn and understand the world around them. The second one is desire for challenge, for instance the desire to figure out the plot of an intricate story or to assimilate new/complex ideas (or dislike) in reading books – often referred to as “getting lost in a book” [4, 13]. According to the same authors extrinsically motivated reading is the reading that one does for recognition, for grades or for competition [14]. There is evidence that both intrinsic and extrinsic forms of motivation may predict amount and breadth of reading [14], however some studies found extrinsic motivation to be negatively associated with leisure reading, suggesting that children who read for the outcomes of reading are less likely to get enjoyment from books [1]. This evidence provides a first clue on the role of intrinsic motivation in leisure reading.

3. LEISURE READING AND THE ROLE OF INTRINSIC MOTIVATION

One of the most notable works about leisure reading is the research conducted by Nell and described in his book “Lost in a Book: The Psychology of Reading for Pleasure”. Here, it is reported only the definition of leisure reading but the reader may refer to the book [13] for more insights on the argument. Nell defines reading for pleasure, or ludic reading – as labelled by the author himself as a form of play, a “free activity” that “absorbs the player completely, is unproductive” and which is “at root a play activity, intrinsically motivated and usually paratelic, that is, pursued for its own sake” (page 2 [13]).

As emphasized by Nell’s definition, leisure reading is primarily a playful activity or, in other words, a paratelic activity – from the Greek para-meaning beside or alongside and telos meaning goal or end. Playful/paratelic activities are those activities that we do because we want to and that are mainly sustained by intrinsic motivation. Accordingly, intrinsic motivation becomes a major factor in the overarching construct of reading motivation. As Wigfield suggested “engagement in reading is greatly facilitated when individuals are intrinsically motivated to read and find personal meaning in the reading that they do” [14].

In addition, research has also found a positive link between intrinsic motivation and the experience of flow [10] – i.e. a mental state of deep enjoyment and intense engagement in a certain activity, where most of a person’s attention resources are devoted to accomplish that activity [4]. This positive link confirms the idea that intrinsic motivation is a major factor in fostering engagement/flow during leisure reading.

4. SERIOUS GAMES OR PLAYFUL BOOKS?

In the light of we have seen in the previous section, how can we address the question of whether it is better to design interactive eBooks as “serious games” or as “playful books”? A possible answer can be obtained by looking at how children’s interactive eBooks are currently designed and developed, to see whether existing approaches effectively support leisure reading.

One approach is to design eBooks that try to mimic as much as possible real paper books. In our opinion this approach has some limits. Trying to virtualize real books is no easy task as digital books often fall short of the affordances of paper: replicating page-flip effect or paper 3D pop-ups on a tablet may make the eBook more aesthetically appealing but per se do not add much to the reading experience. A more popular approach is to design interactive eBooks in the form of serious games – i.e. games developed with the intention to be more than mere entertainment (Ritterfeld et al. as cited in [6]). This approach has its drawbacks, too. First of all the original storyline of the book has to be transformed (abridged most of the times) in a storyline suitable to be made into a game, thus jeopardizing the quality and complexity of the narrative (the same reason why some movies based on books are quite
disappointing). Secondly, and more importantly, the focus of the experience might be shifted from reading to gaming. This means that a soconceived eBook may leverage children’s extrinsic motivations if not even motivations completely disconnected from reading – i.e. reading. Although one may engage in the gameful component of the eBook because she is intrinsically motivated to do so, this acts as an extrinsic motivation for the activity which is meant to enhance (i.e. reading). The risks connected with this approach is that extrinsic motivations have been shown to harm intrinsic motivation in many studies [5]. In other words, an interactive eBook built on game elements, may undermine intrinsic motivations connected with leisure reading. This in turn might encourage children to read and lead to in external incentives connected with the gameful component: right the opposite of the idea that sees the eBooks as a way to motivate and involve children in reading.

According to Knaving & Björk “It is possible to argue that if there is no intrinsic motivation, extrinsic motivation is harmless. […] If the user mainly focuses on the game elements, she or he may not have the chance to develop motivations related to the activity itself that could have supported further involvement.” [9]

For all the above reasons we advocate that interactive eBooks should be conceived as playful books rather than serious games in order to leverage intrinsic motivations connected with leisure reading. This means that the eBook can be enhanced with, for instance, multimedia and interactive elements but the story itself and the textual component must withstand as the core element of the eBook. In the following section we will see how eBooks can support leisure reading and we will provide some examples to illustrate how this could be achieved.

4.1 Designing Playful Interactive eBooks

Designing playful eBooks means designing eBooks aimed at leveraging intrinsic motivations or at supporting internalization and integration of extrinsic motivation. Thus in the first place the eBook should address the three aspect of intrinsic motivation associated with leisure reading we mentioned before – i.e. curiosity, desire for challenge and involvement. To foster curiosity an eBook should allow for exploratory behavior and for different modes of fruition. This could be achieved by using interactive and audiovisual elements to supplement and enhance text (not to replace it) in order to add redundancy to the textual information. This would allow for a non-linear multi-path reading experience that children could tailor to their skills. For instance providing read-aloud narration of the text, videos that summarize parts of the book or in-line illustrated descriptive cards may facilitate weak readers’ text comprehension or may provide strong readers with a more challenging reading experience. Research has shown that a good balance between the challenges of a text and a reader’s skills is an antecedent of ludic reading [11, 13]

And this brings us to the second aspect of intrinsic motivation in reading, namely the desire for challenge. In this context “challenge” should be understood as “opportunities for action”: eBooks can be designed to give the children the freedom to select the opportunities they perceive as the most challenging and meaningful ones from a subjective point of view. An adequate level of challenge is also one of the key conditions for flow to occur [11, 12], together with clear proximal goals and immediate feedback [12] (a condition which, as we wrote in Section 2, may also increase self-efficacy). Interestingly enough, the concept of flow (see Section 3) is very similar to the dimension of involvement described by Wigfield and Guthrie (see Section 2) and that may explain why it resonates with reports of (optimal) reading experiences [11]. As a matter of fact the experience of “being lost in a book” shares many if not all the characteristics of flow state: focus, concentration, action and awareness, loss of reflective self-consciousness, sense of potential control, distortion of temporal experience and experience of the activity as autotelic – i.e. intrinsically rewarding [12]. We can therefore understand the importance of designing an eBook which supports – or at least does not interfere with – the conditions of flow. Possible ways to balance challenges with skills have been already discussed, but it must be added that in order to provide clear goals and immediate feedback, the eBook should first of all be usable and then should not have elements that distracts the user from the activity (see [7], page 73).

From here it follows the importance of using interactivity not for the sake of it, but to enhance the reading experience and give a meaningful contribution to the text; otherwise it would be just a distraction for the reader (and a potential barrier to engagement/flow).

To clarify this last point we can use the example of Alice for the iPad, a popular adaptation of Lewis Carroll’s Alice in Wonderland. When released on the market this iPad™ adaptation caused significant controversy because it prizes interactivity over reading and someone was concerned that this would jeopardize children’s reading habits. Even if we do not share this concern, a walkthrough of this interactive Book reveals that interactivity does not provide a meaningful contribution to the text – rather it confines reading to an incidental activity. This said, the eBook in question is quite popular and have had a good commercial success, so it is not our intention to criticize the approach that the developers have undertaken. What we want to point out is that a so-conceived eBook may favor extrinsic motivation connected with gaming at the expense of intrinsic motivation connected with reading, and in this context it may not contribute to a more engaging reading experience but rather it transforms the reading experience in a gaming experience, which is something completely different – and may explain the popularity of the eBook.

In the following section we will see how design elements can be implemented in an eBook while at the same time preserving the real nature of the reading experience and fostering the intrinsic motivation which might sustain it.

5. MEANINGFUL GAMIFICATION

So far we have omitted discussing an approach that is touched by many as a solution to motivate people in using software applications which has shown to be successful in sustaining a user’s state of engagement [9] and which has caught on in recent years. We are talking of gamification – i.e. the use of game design elements in non-game contexts [6]. To be precise, according to Deterding et al.’s categorization [6], in this paper we are actually referring to design for playfulness rather than to gamification, but as argued in (serious) games. But this approach too may present some risks if not properly done. In fact, gamification works well when people have little or no motivation to engage with the activity, but when the activity may be intrinsically rewarding (as in the case of reading) one should be careful not to harm intrinsic motivation.

In this respect, Knaving and Björk [9] if play is an integral part of games then the definition of gamification may be extended to include play. At any rate, we have seen why it is desirable to make eBooks playful through gamification rather than completely transform them in (serious) games. But this approach too may present some risks if not properly done. In fact, gamification works well when people have little or no motivation to engage with the activity, but when the activity may be intrinsically rewarding (as in the case of reading) one should be careful not to harm intrinsic motivation. In this respect, Knaving and Björk [9] provided two sets of design suggestions on how to effectively introduce gameful elements in non-game contexts. They suggest to designers to take care not to distract users from the focus on the activities, in order to preserve the intrinsic motivations that these may contain. To this extent they suggest that: the gamification layer should not obscure the main activity; the gamification layer should be opt-in or invisible, in that users should not be forced to interact with it unless they want to; mandatory actions should always be meaningful in regard to the main activity; the gamification layer should allow the user to maintain control over the activity [9]. The second set argues that since play is an integral part of games than it is useful to explore possible affordances for playfulness and in addition that support internalization [9].

The eBook Dracula: The Official Stoker Family Edition provides an example of how to use interactive/ playful elements to support reading. As with Alice for the iPad, also in this case there is an extensive use of non-textual elements but we feel that the developers have done a better job designing the elements so that they provide a meaningful contribution to the text and reading remains the primary activity: users have to interact with the eBook application to reveal hidden text on a page or some additional multimedia content (e.g. light up the words on a page with a lantern, unseal the mysteries of letters and journal entries, blowing the leaves off of tombstones to reveal the writing beneath, etc.) and this may support them in getting immersed in the storytelling.

5.1 Internalization of Extrinsic Motivation

Ideally, gamification should also be aimed at promoting internalization of extrinsic motivation for reading. This consideration is supported by a modern motivational theory: Self-Determination Theory (SDT). This theory distinguishes various type of motivation according to their Perceived Locus of Causality: from a fully external one (extrinsic motivation) to a fully internal one (intrinsic motivation). What is even more interesting is that SDT accounts for determinants of motivation, which have a crucial role in the maintenance of intrinsic motivation and are also important for promoting the internalization process (simply put: transforming extrinsic motivation in intrinsic motivation).

According to SDT, there are three motivational determinants: perception of autonomy, perception of competence, and perception of relatedness. These motivational determinants can be traced directly to the psychological needs for autonomy, competence, and relatedness, respectively [10]. The need for autonomy concerns “people’s universal urge to be causal agents, to experience volition, to act in accord with their interests, and to feel a sense of personal responsibility for their successes and failures” [10]. The need for competence concerns “people’s inherent desire to be effective...
dealing with the environment”; while the need for relatedness “concerns the universal propensity to interact with, be connected to, and experience caring for other people” [5].

According to Deci and Vansteenkiste “the need for relatedness seems less integral for supporting intrinsic motivation than are the needs for autonomy and competence” [5]. A study by Kowal and Fortier further showed that perceptions of autonomy, competence, and relatedness – and self-determined forms of motivation such as intrinsic motivation and self-determined extrinsic motivation – are positively related to flow [10]. It follows that the playful elements of the eBook should be designed to help children to feel competent and autonomous even though the reading was initiated because of extrinsic motivation (e.g. reading a book because asked by the teacher). For example, providing in-line dictionary definitions or puzzles that require the reader to recall parts of the story in order to be solved might help children to assimilate any new/complex ideas found in the text without any external aid and therefore make them feel more competent and autonomous.

6. CONCLUSION
In this paper we presented our reflections how interactive eBooks can better support leisure reading. We discussed how existing psychological theories may inspire new approaches to the design of children’s interactive eBooks that better support leisure reading. We have argued that the goal of a well designed interactive eBooks that better support leisure reading.

Before concluding, we want to stress that: first of all what we discussed in this paper.

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Interactive e-Books to Support Reading Skills in Dyslexia

Gianluca Schiavo
University of Trento & FBK
Trento (Italy)
gianluca.schiavo@unitn.it

Vanessa Buson
Centro per i DSA e le Difficoltà Scolastiche - il Cigno
Verona (Italy)
vannessa.buson@ordinependicologiveneto.it

Abstract
Developmental dyslexia is the specific learning disability in reading that affects the ability to read written text. In the current paper we explore the potential offered by interactive e-book technologies for supporting reading in people with developmental dyslexia. An important aspect of interactive e-books, which cannot be easily achieved with traditional printed media, is the ease of customizing the text layout in a way that can potentially help those with reading difficulties. We discuss findings from empirical studies in psychology and accessibility that identify best practices for presenting electronic text for readers with dyslexia. Moreover, given the spreading availability of e-readers and the flexibility provided by e-books to present content in different ways, we discuss the opportunities of using interactive e-books for improving reading skills. We believe that interactive e-books can be used not only as a support for facilitating reading but also as a way to develop and enhance the learning abilities of dyslexic readers.

Categories and Subject Descriptors
H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

General Terms
Design. Human Factors.

Keywords
Interactive e-Books; Dyslexia; Learning Disabilities; Reading Difficulties.

1. Introduction
Developmental dyslexia is a specific learning disorder characterized by difficulties in reading acquisition despite adequate intelligence, conventional education, motivation to learn and sociocultural opportunity [1]. Dyslexia is characterized by a distinctive cognitive profile with specific areas of strength and weakness. People with developmental dyslexia have a preference for thinking visually rather than verbally and distinctive perceptual abilities, such as sharper peripheral vision [10]. However, dyslexic people face challenges in acquiring automaticity in reading. As a result, reading is slow and error prone, which may influence reading comprehension and learning from text, with negative effects on the person's education and self-esteem.

Several theories have been proposed for explaining the cognitive profile that characterizes dyslexia and its reading impairment (for a review see [5]). The more prominent theories view the reading difficulties as a consequence of a specific phonological deficit (the phonological theory), a deficit in the visual processing of letters and words (the magnocellular theory) or a coordination dysfunction (the cerebellar theory). These theories are still widely debated, but it is well established that developmental dyslexia has a neurobiological basis with a genetic origin.

Since dyslexia is a developmental disorder [5], it is present at birth and its effects are lifelong. However, reading difficulties can be reduced with early intervention that integrates appropriate training and the support of technology [9]. This paper provides an overview of technological tools that facilitate reading for dyslexic users, with a specific focus on interactive e-books. Specifically, the main contribution is a review of the literature on the text formatting that should be adopted for facilitating the reading of digital material, and a discussion on how interactive e-books can be used in the intervention for reading difficulties.

2. Facilitating Reading through Technology
Readers with dyslexia found difficulties in reading text formatted in traditional ways. The main obstacles that a dyslexic reader might encounter while attempting to read text include:

Visual recognition difficulties, such as difficulties in recognizing and identifying words, letters and numbers. Word identification is also slowed by the effect of visual crowding, a perceptual phenomenon that refers to the interference of flanking letters on the recognition of target letters [20, 18].

Phonological and orthographical difficulties that manifest themselves as problems in associating written letters (grapheme) with their specific sounds (phonemes) and in relating the sounds of language to letters and words with a consequent latency in naming.

These obstacles have an impact on the reading performance, leading to:

- Slow and error-prone reading;
- Misspelled words and difficulties in identifying and remembering complex and new words;
- Poor reading comprehension;
- Fatigue after reading for a short time.

Moreover, the reading impairment may be accompanied by difficulties in writing, especially in spelling and handwriting.

However, several studies have demonstrated that specific training programs and supports, such as changes in the text presentation, can improve reading performances and content comprehension [9, 5]. In the last decades technology has become an essential tool for helping dyslexic readers. In fact, the development of strategies for coping with reading difficulties often relies on the use of technology: children with dyslexia are encouraged to use computers for studying, both at school and at home. As a result, many students with dyslexia use technology such as:

- Software programs that combine OCR (optical character recognition) and text-to-speech (speech synthesizer), allowing automatic reading;
- Speech recognition applications to translate spoken words into text, which support the process of typing and spelling;
- Spell-checkers and spell-predictors for aiding writing and manipulating text;
- Software for creating concept and mind maps to organize the information in a visual manner.

Many of these functions are already integrated in most popular operating systems (across different platforms, from desktops to tablets and mobiles) and are embedded in many applications available for the wide audience, such as the voice recognition technology in Apple’s OS X and iOS, the optical character recognition provided by Google Drive and the spell-checker included in office software suites. These functions can be integrated in interactive e-books and in e-reader applications. In addition to this, interactive e-books can be used to support the activity of reading electronic content by manipulating the text formatting.

3. Dyslexia-Friendly Formatting
Research based on a sample of non-dyslexic readers suggests that reading content using electronic media, such as e-book readers, is comparable in terms of reading performance and text comprehension to reading text presented in traditional paper [11]. Nevertheless, these results might differ when considering readers with dyslexia: presenting text through an electronic media can indeed provide a substantial support for this portion of the readers’ population [17].

Empirical evidence from psychological research has demonstrated the effect that certain manipulations of the perceptual features of the text may have on speed, accuracy and reading comprehension in readers with dyslexia [13, 20, 18]. Among e-book applications, many functions have been proposed for formatting the text in customized ways. These functions include modification of the font, rearrangement of the page layout and manipulations of the dynamics of reading [16, 17].

Guidelines for designing dyslexia-friendly content can be found in the area of Web accessibility [4, 12]. The British Dyslexia Association (BDA) [2] has proposed a set of recommendations on how to present “dyslexia friendly” text, with suggestions for both digital and printed content. This list contains a considerable set of recommendations, and suggests good practices for making material visually accessible for readers with dyslexia. However, the list is not based on empirical evidence and does not include recent findings, such as the potential benefit of using short lines of text [18] and a bigger letter spacing [20]. BDA's guideline has been compared with a set of specifications for the visually impaired users [6]. The comparison suggests that accessibility recommendations for minimizing visual discomfort and for facilitating the visual part of the reading process of web pages can benefit dyslexic, partially sighted and non-impaired users as well [6, 12].

The following list (and Table 1) presents a summary of recommendations obtained from [2, 4, 12] and combined with recent empirical research from psychology and education:
Table 1. Summary of recommended formatting styles

<table>
<thead>
<tr>
<th>Formatting</th>
<th>Recommendation</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Font size</strong></td>
<td>Relatively big fonts (size between 12 and 16 pt)</td>
<td>[14, 20]</td>
</tr>
<tr>
<td><strong>Line length</strong></td>
<td>Short lines</td>
<td>[20, 18, 17]</td>
</tr>
<tr>
<td><strong>Background and text color (contrast)</strong></td>
<td>Background with light colors and text in black or dark grey</td>
<td>No clear empirical evidence on the benefits of these recommendations</td>
</tr>
<tr>
<td><strong>Alignment</strong></td>
<td>Right-aligned text should be preferred</td>
<td></td>
</tr>
<tr>
<td><strong>Emphasizes</strong></td>
<td>Use bold for emphasizing</td>
<td></td>
</tr>
</tbody>
</table>

Alignment and emphasizes: Right aligned text should be preferred. Justified text might create large uneven spaces between words, making reading difficult. Italics and underlined words should be avoided; it is suggested to use instead bold for emphasizing. However, there is no strong empirical data in the literature to support these claims.

It is important to note that inter-subjective variability in setting up the optimal values for these parameters is high, and it is inherently difficult to provide defined guidelines for a general profile of users with dyslexia. It is thus recommended to use a customizable and flexible environment, where the user, or someone on his behalf such as the therapist, the teacher or the parent, can adjust the values and configure their desired text layout.

Moreover, the studies considered in our review are based on samples with different age ranges: from primary schoolchildren [20, 14] to high school students [17, 18, 13] to adults [15]. It is thus difficult to claim whether modification on the formatting could best support preschoolers, young readers or adults with dyslexia. According to clinical guidelines, dyslexia should be diagnosed after children have reached the first or second grade but it might be the case that adapting the text presentation might also benefit preschoolers and early-learners.

The flexibility afforded by e-books and e-readers to modify text formats demonstrate the potential in using these technologies to support reading with dyslexia. A number of applications have been designed for this purpose, taking into account some of the parameters presented in our review. These are mainly e-reader applications (e.g. [16]) and tools for adapting the presentation of Web content (e.g. [12]). However, reformating the page might address the accessibility shortcomings of traditional formatted text or of printed books, but not necessarily improve the users experience when reading. In the next paragraph, we outline the specific benefits that interactive e-books might integrate not only for making text more accessible but also for developing the learning skills of dyslexic readers.

4. INTERACTIVE E-BOOKS TO TRAIN READING SKILLS

As previously discussed, interactive e-books can make reading easier for those with dyslexia because they permit formatting changes of the written text. Notwithstanding, the modification alone cannot address all of the difficulties faced by dyslexic readers [18].

A promising line of research investigates how e-books and e-readers can support different methods of reading with respect to traditional paper-based books, providing solutions that better meet the cognitive style of readers with dyslexia [3]. For example, an ebook can be read on portable handheld devices that might have small screens. Recent studies have provided evidence that using small-screen devices, such as smartphones, might help people with dyslexia to read faster and more accurately. It has been found that reading written content on a 3.5-inch screen using the particular method of text presentation, so that the text spans only a few words per line, improves speed and accuracy in students with dyslexia. This reading method, which can be implemented with commercially available e-reader software3, might limit the attention span and reduce the demands on visual attention and memory [18, 17]. Moreover, holding the e-reader in the hand has proven to positively influence reading performance in dyslexic readers with reduced attentional resources. Having the text placed in proximity to the hand might help to maintain the focus of attention on the text, preventing visual interferences and improving allocation of attention [18]. Yet, major benefits have been observed specifically for dyslexic students who struggle most with phoneme decoding or have limited attentional span.

In addition, interactive e-books are tools that can easily permit the authoring of the content and its adaptation at different levels (e.g. formatting, content, modality). These features make e-books potential tools for supporting the treatment of reading difficulties. For instance, within a reading skills training program a therapist can modify the text properties (e.g. formatting, text length, dynamic of text presentation) of the children’s e-readers for adapting them to the characteristics of the training. The flexibility provided by e-books allows the therapist to adjust the parameters according to the progress achieved as the training program progresses. The therapist can also monitor the progress and adjust the text properties remotely using the Web.

Interactive e-books might also be designed to harness adults as teachers and play partners for children during reading activities. For example, e-books allow one to record one’s voice while reading, allowing parents (or the child him/herself) to record the narration. This is good training for memorizing and practicing word pronunciation. Moreover, interactive e-books might integrate functionalities that permit the reader to listen and practice the recognition of basic units of speech (syllables and phonemes) within different words. This activity can improve children’s phonemic awareness: the awareness of the sound structure of spoken language and one of the fundamental skills for reading. Computer applications are already available as exercises in the form of games for training the recognition of phonemes, but the integration of this function in interactive e-books seems a promising addition: it has been shown that daily practice in lettersound association is effective in increasing phonological awareness, and that in turn might have a positive impact in reading abilities [9]. It is also worth noting that support practices for students with dyslexia within an educational context can alleviate difficulties faced by all students, including early readers and students with learning difficulties. From a developmental point of view, dyslexia should in fact be considered to be at the lower end of a continuum of reading ability that also includes poor and normal reading abilities [19].

Thus, it is likely that beginner or poor readers might also benefit from resources designed to support learners with dyslexia.

Another interesting line of research is the use of interactive games as training tools for basic attentional
skills that, in turn, might affect reading abilities. Recent studies have demonstrated that it is possible to enhance specific attentional skills in dyslexic children, such as visuo-spatial processing, using specific video games [7]. These findings open up opportunities for integrating interactive activities in the form of simple games in e-books, making the digital reading more engaging and beneficial at the same time.

Taken together, these studies show that there is a great potential in interactive e-books: they are potentially accessible to users who have reading difficulties and can be used as tool for developing and enhancing reading skills. In reaching this goal, it is important to ground the design of interactive e-books on evidence-based findings in which cognitive aspects characterized dyslexia and in which intervention are actually effective. This paper is a preliminary step in guiding the design of interactive e-books for readers with dyslexia defining those characteristics that may improve the quality, the ease and the enjoyment of reading in children - and potentially also in adults - with dyslexia.

5. REFERENCES
Part 2
Art and Literature in e-Books
ABSTRACT
In this paper we describe an interactive platform for reading classic literature in high schools. This digital platform has been experienced by students and teachers during a research project, providing excellent results. It allows active learning, collaboration (e.g., collaborative annotation of text and content sharing), linguistic and narrative analysis. We will describe in details two interactive visual tools provided by the platform, i.e. social networks of characters and maps of literary settings.

CATEGORIES AND SUBJECT DESCRIPTORS
K.3.2 [Computer and Information Science Education: Literacy.]: K.3.2.1 Computer Uses in Education: Collaborative learning.

KEYWORDS
Classic literature; social network analysis; literary geography; computational narratology; HTML5

1. INTRODUCTION
Reading classic literature at school has never been a simple and enjoyable task for most of teenagers. In recent years the difficulties have increased, as teenagers are immersed into the world of web and social networks, that can lead to lower attention span (see [4]) and make it more difficult to read and analyse literature. In this paper we will present some of the differences we addressed during a research project in high schools and the positive experiences we had with students and their teachers, using interactive digital tools for reading classic literature.

2. THE SEDUOCO PROJECT
The results described in this paper were achieved during the research project Sharing Educational Content (Séduco), a two year project carried out in the autonomous province of Trento. We investigated the use of digital tools in learning activities in high schools, concerning, in particular, the understanding of classic literature. The project partners were four Italian high schools, two small enterprises (Cross Library and OpenContent), and the Human Language Technology research unit at FBK (Fondazione Bruno Kessler). Students and teachers in Italian upper secondary school (student age 14 to 18) were the users involved in this project.

One of the main tasks was to design and develop a collaborative learning environment for reading classic literature. Which activities can a student carry out on a digital platform? How can these activities be effectively used when we read and analyse literary texts? How can these activities be effective and enjoyable? The competency-based learning model has exceeded the traditional lecture-based model, but it is not easy for teenagers to approach these innovative tools and achieving positive results. In agreement with [6], for example, we believe that “computational narratology has the potential to revolutionize the way we create and study literature”, i.e. we think that some computational technologies can be effectively used when we read and analyse literature. In this paper we will present some of the issues we addressed during a research project in high schools and the positive experiences we had with students and their teachers, using interactive digital tools for reading classic literature.

3. LITERARY GEOGRAPHY MAPPING
Literary geography is a powerful tool to stimulate students’ interest in classic literature. As Piatti et al. [9] wrote, “Mapping spaces in fiction seems like a simple idea. But in fact, it turns out to be a major interdisciplinary challenge […] After facing a certain period of stagnation, where no more convincing solutions could be found, this research area currently prosper, inspired and supported by means of an advanced digital, interactive, animated and database-related cartography.”

Together with students and their teachers, we tried to answer the question: where are the events of these novels take place? That is we tried to visualize the settings of the books (according to [10]). As the students were reading an historical novel, we georeferenced the locations in an ancient map (see Figure 1), i.e. a map of the age in which the author lived (the nineteenth century), even if the story takes place in the seventeenth century.

4. SOCIAL NETWORK ANALYSIS
In narratology, Social Network Analysis (SNA) has been used mostly as a new instrument for the study of plot evolution. By the extraction of the interactional networks of characters from narrative works and the subsequent synthesis of the obtained data in network graphs, it is possible to open a whole new perspectives to better comprehend the dynamics and the structure of a narrative plot.

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In a fantasy novel, such as Le avventure di Pinocchio (The adventures of Pinocchio), how can the settings be shown? The task is not easy and the literature on this topic is vast. We investigated different possibilities, and at the end we chose to draw a simple fictional map (see Figure 3). Clicking or tapping on a marker in the map (current, ancient, fictional), the user finds the sequences of the novel set in that place. This way a student can access to portions of the books through the settings (locations) shown on the maps.
The graph in Figure 4 represents the complete conversational network of I Promessi Sposi, elaborated with the SNA visualization software Gephi. The dimension of each node is due to the number of conversational interactions (“degree” in SNA terminology) in which that node’s character is involved; in fact the largest node, in the very middle of the graph, embodies Renzo Tramaglino, the main character in the novel.

5. HTML5 STANDARD

From a technical point of view, our system is a web application based on HTML5. In Italian school there isn’t a reference technology which could be considered a standard to develop advanced e-learning applications, so we had to evaluate different technologies to present content in effective way.

Alongside the “conversational network”, we also extracted a second network from I Promessi Sposi: while the nodes still represent the main characters of the novel, this time an edge between two characters identifies their co-occurrence in the same narrative sequence. The graph in Figure 5 illustrates this second action-oriented network.

As it is possible to notice even at a first glance, while the general structure of the two networks is similar, there are few interesting differences; for example, in the second graph the node Lucia Mondella, the main female character, has a slightly larger degree than the one of Renzo, and achieve the status of larger hub of the graph. This is particularly interesting since the main plot of the book splits very soon into 2 separate narrative lines, one for each of the titular betrothed lover. According to our graphs, the role of Lucia is more action-oriented while the one of Renzo more involved in conversational interactions.

Clicking or tapping on a node in the social networks, the user finds the sequences of the novel concerning that character (narrative sequences or dialogues).

8. REFERENCES


8. REFERENCES


Art Education in the Digital World.

A picture book as app

[Long Abstract]

Tina Kothe
University of Munich (LMU)
Institute of Art Education
Leopoldstr. 13
80802 Munich, Germany
tina.kothe@lrz.unimuenchen.de

Ida Buchwald
University of Munich (LMU)
Institute for Informatics
Amalienstr. 17
80333 Munich, Germany
ida.buchwald@ifi.lmu.de

Sarah Tausch
University of Munich (LMU)
Institute for Informatics
Amalienstr. 17
80333 Munich, Germany
sarah.tausch@ifi.lmu.de

Anja Mohr
University of Munich (LMU)
Institute of Art Education
Leopoldstr. 13
80802 Munich, Germany
anja.mohr@lrz.unimuenchen.de

Heinrich Hußmann
University of Munich (LMU)
Institute for Informatics
Amalienstr. 17
80333 Munich, Germany
heinrich.hussmann@ifi.lmu.de

GENERAL TERMS
Design, Experimentation, Theory

KEYWORDS

1. INTRODUCTION

In Art Education the possibilities offered by the ‘digital world’ are widely neglected. Taking up this negligence, the thesis concerns an aesthetic media almost every child, teacher and parent is familiar with since infancy: the picture book. [12] We combined the picture book with the interactive elements of a game and transferred it into the realm of the digital world. The goal was to create a unique experience for children that neither a game nor a printed picture book could accomplish by itself. It combines elements of reading, hearing, pictures, interaction, game and art. The digital picture book, especially the book-game, is more than an aesthetic object. My hypothesis is that the digital picture book is an aesthetic experience[13] in itself, consisting of ve elements: ludological, narratological, visual, acoustic and social elements. To evaluate the theoretical hypothesis whether such an interactive picture book is able to create new creative experiences, we conducted a user study with 3rd grade primary school children aged 8-10.

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2. PROTOTYPE

The interactive picture book named ‘Journeys to Elsewhere’ (see Figure 1) has been realized as an iOS-Application for the iPad. Concept and graphics were done by Tina Kothe, implementation and the conception of a user study with 20 school children were done by Ida Buchwald. The story of the book evolves around a child, that is swept away by a creature named ‘Groelm’ to the world ‘Elsewhere’. There the child - or the reader of the app - has to help the inhabitants to solve their problems. There are three problems to be solved in the app: mushrooms have to be sorted, a labyrinth crossed and bottles in a desert uncovered. Grateful for the help, the inhabitants give the child a gift in form of mushrooms, stones and bottles. These gifts can be used in the creative part of the app to shape the ‘homeworld’ of the child, a bleak town, as the reader/player wishes.

For the implementation ‘Xcode’ was used as a developers platform. Some structures for apps are already existing in this platform, like storyboards, the possibility to ‘drag-and-drop’ graphical elements to the right place and a PageView-Controller for turning the pages of the digital book. Difficulties where the strict structures of the page turner, that should not always be active (especially not during the riddles). For that reason Ida Buchwald constructed a costumized page turner that is only active in parts of the picture book where the story develops.

The digital picture book app ‘Journeys to Elsewhere’ contains five elements: there are parts of ludology in collecting items, solving riddles, embedded into the narrative elements of the story of a child going to the place ‘Elsewhere’. The visual element concentrates on the ‘pages’ or ‘screens’, which are designed like classical picture books: pictures and text invite to see and interact with the characters. Unlike in a classical picture book, the option to turn a page is restricted during riddle-sections. They only unlock when the riddle is solved. It also contains a sole art educational part, where the collected items can be freely positioned and arranged onto the background and thus the ‘world be shaped’ (see Figure 1). The acoustic element both is a sound feedback and creates a certain mood of the story. The social element mostly exists outside the digital picture book.

3. USER STUDY

In our study pairs of altogether 20 primary school children (3rd grade, average age 9) collaboratively interacted with the picture book. The study was conducted as a qualitative study after the grounded theory method and qualitative empirical social research methods. Important for Ida Buchwald was the interaction (and difficulties) of the children with the ipad and the app itself. Tina Kothe’s main focus where the previously mentioned aesthetic experiences of the children and their approaches to the creative parts of the story.

For the study, the children groups were selected at random, but all children knew each other from the classroom. The number of boys and girls were equal, the testing pairs were two groups of girls, one pair of boys, the other groups were mixed boy and girl. 70% of the children previously had contact with a tablet-pc, the other had never used one before. Each pair of children was video-recorded and at the same time monitored by an observer. The observer did not interact with the children, unless they asked something. The children’s task was simply to ‘play the app and tell us how they liked the app (text, sound, pictures, story), what they liked best and what not’. All groups spent about 30 minutes to read and play the app. The evaluation consists of the answers of the children, as well as the analysis of the video material. Ida Buchwald’s findings here are very diverse. It depends on the children if they act together or try to do everything alone. The implementation of the picture book did encourage cooperation as it allowed both children to act at the same time. Not only collaboration but also the reflecting communication of the children with us was of great importance to the results of the
study. We integrated the children as valued testing persons, whose opinions were essential to us. They provided constructive criticism concerning the improvement of the content and implementation. This demonstrated their good understanding of the digital and aesthetic processes.

4. THE ART EDUCATIONAL VIEWPOINT

The art educational viewpoint is concerned with the new aesthetic experience a digital picture book can offer. Analysing the video material of the study[8] showed many structural moments of creative-aesthetic behaviour, but the question was, if those moments differed from those experienced while reading classical picture books. Based on studies of Anja Mohr concerning ‘Digital Drawing with Children’[3] and the hypothesis of the ve elements of a digital picture book, an analysis of the study conrmed three new possibilities for aesthetic experiences.

Depending on the approach of the children, one ‘creative-aesthetic activity’ is staging, integrating and arranging just like in digital drawing[3, 4]. The children used the items they collected during the story to arrange and stage them in the environment. The second activity is a mixture of process oriented playing and experimenting, not concerned with a result but out of accidentally discovered functions (like tilting or enlarging) or new thinking. The third activity is called ‘artistic approach’. It seems that this activity does need some encouragement from the outside. It mostly appeared in a more informal environment and not inside the restrictive school hours.

5. CONCLUSION

Our study conrms that a digital picture book can act as creative-aesthetic experience, a very important aspect of art education. Cooperation between informatics, art education[4] and other elds of study like music, pedagogy and social sciences has greatly improved the results of this master thesis.

6. ACKNOWLEDGMENTS

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7. REFERENCES

Part 3
Beyond traditional e-Books
Extending (e)books

Open questions on how e-books can change reading and extend the traditional concept of book

Reading

Classic perspective:
Reading is the process by which a reader extracts visual information from a piece of written text and makes sense of it.

Multimodal perspective:
The particular material and social affordances of new technologies and screen, as opposed to page, have led to the reconfiguration of image and writing on screen in ways that are significant for writing and reading (Kress & van Leeuwen, 2001, van Leeuwen, 2005)
**Multimodality of Reading**

Written text is only one part of the message and no longer the dominant part.

**Different Platforms**

**New ways of reading**

Changing the way we read with our eyes

Examples:

[Website Link]

**New ways of reading**

Rapid Serial Visual Word Presentation (RSVP)

Different reading strategies:

"I took a speed reading course where you run your finger down the middle of the page and was able to read 'War and Peace' in twenty minutes. It's about Russia." (Woody Allen)
**New ways of reading**

**Dyslexia**
**Span-Limiting Tactile Reinforcement (SLTR)**

Sunesg et al., Plus 2013

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**Touching the (e-)books**

**Expanding traditional printed media combining and crossing different media**

**Examples:**

- **Engage Book / Bridging Book**
- **Marginalia**

Marginalia: [http://people.artcenter.edu/~cbecker](http://people.artcenter.edu/~cbecker)

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**New ways of reading**

**Dyslexia**
**Span-Limiting Tactile Reinforcement (SLTR)**

Sunesg et al., Plus 2013

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**Touching the (e-)books**

**Wearable interacting “reading technology”**

**Sensory Fiction (MIT)**


[http://vimeo.com/84412874](http://vimeo.com/84412874)
Towards digital storytelling

Zombie run
Combining ebooks, game and healthy behaviours
https://www.zombiesrungame.com/

Towards digital storytelling

First draft of the Revolution
Interactive storytelling
(hyper linked ebook)
http://lizadaly.com/first-draft/

Reading for all

EBONI project
http://ebooks.strath.ac.uk/eboni/index.html

The Universal eBook

Braille

Open Questions

How interactive e-books can change the way we read?

How they are changing the boundaries between reading and other activities (eg play)?
Concerning the first reading application that promotes the comprehension of the written text [1]. The system uses
still under the topic the text comprehension side. on preliminary tests the application seems to be promising both on the reader’s engagement side and on the text comprehension side.

Still under the topic “Reading Skills and e-Books”, Gianluca Schiavo presented the work investigating the potential of interactive eBooks to support reading activities and learning abilities in children with dyslexia [7]. In particular, his presentation focused on the findings from empirical studies in psychology and web accessibility that identify best practices for presenting electronic text for readers with dyslexia. The author also discussed the opportunities of using interactive e-books for improving reading skills, enhancing attentional and phonological processes. The workshop participants discussed how e-books and content specifically designed for dyslexics can also benefit the whole population of readers.

The first session was closed by Luca Colombo who discussed the design of playful e-books, highlighting possible risks of applying gamification to the design process [4]. After having presented various facets of reading motivations and having pointing out the prominent role of the intrinsic motivations in leisure reading, the author wondered whether gamification can be used in a meaningful way to support leisure reading. The issue has been largely discussed, starting from the pertinence of using (or not using) “gamification” as concept linked to e-books.

The second session, around the topic “Art and Literature in e-Books”, opened with the presentation and demo of “Cbook”, an interactive platform for reading classic literature in high school in an innovative way, developed by Cross Library [2]. In this work, semantic technologies have been used to create an application allowing students to browse novels following characters or searching for places. Also in this case, although an extensive evaluation has still to be accomplished, it seems that even students with a few literary interests enjoy the application.

Furthermore, teachers involved in the system design have considered Cbook as a very useful tool for teaching, making the platform particularly suitable for educational purposes.

The second session has been completed by the presentation of Tina Kothe, who described a picture e-book that combine elements of traditional picture books with interactive elements of digital games, while aiming to put children in contact with the art world in an engaging way [5]. In particular, this digital picture book includes playing, storytelling, images, sounds and cooperation aspects, namely the five basic elements (i.e. ludological, narratological, visual, acoustic and social) that characterize a book and through which the readers can experience the aesthetics.

The third and final session, around the “Beyond Traditional e-Books”, has been covered by the presentation of Gianluca Schiavo who presented a critical review of the most innovative enhanced eBooks that researchers and publishers have proposed so far [7]. Starting from classic and multimodal perspectives of reading, new ways of reading supported by different platforms have been investigated.

The workshop ended with a final brainstorming, mainly based on the sticky notes collected during the presentations along the day (see Figure 1).

The workshop presentations have been organized in three sessions, around three main topics:

a) Reading Skills and e-Books
b) Art and Literature in e-Books
c) Beyond Traditional e-Books

Concerning the first topic “Reading Skills and e-Books”, Fatma Al Aamri presented an engaging reading application that promotes the comprehension of the written text [1]. The system uses interactive techniques based on the building of visual scenes corresponding to the textual content of a story. Although an extensive evaluation has not been conducted yet, according to preliminary tests the application seems to be promising both on the reader’s engagement side and on the text comprehension side.

The workshop presentations have been organized in three sessions, around three main topics:

- Reading Skills and e-Books
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- Beyond Traditional e-Books

Summarizing the issues pointed out and discussed, the brainstorming mainly focused on the following topics and questions:

- **Motivations**: when designing interactive ebooks, we should consider motivational aspects entailed during e-books reading. In particular, intrinsic motivation seems to play a crucial role in the reading experience.
- **Multimodality**: ebooks address us towards new ways of reading (multimodal reading). We need to better investigate which information can be best conveyed through different communication channels and sensory modalities. To do this, it might be useful to consider past studies on multimedia learning (e.g. (Mayer&Moreno, 2003)).
- **Playful ebooks**: ebooks might be viewed as “digital playgrounds”. In designing for playfulness, we might consider the common distinction between paidia (spontaneous play) and ludos (controlled/regulated play) (e.g. (R. Caillois, 1961)).

![Figure 1: A moment of the final brainstorming (on left), around the sticky notes written down by the workshop attendees (on right).](image-url)
• **Creativity**: ebooks, as well as traditional books, should leave space to creativity. However, it is not always clear how to support creativity and how to assess its outcomes when considering interactive ebooks.

• **Content**: text, pictures and animations are different forms of visual information that characterized the content of ebooks. How these different styles of presentation change the reading experience in terms of engagement, playfulness, creativity and learning?

• **Ebooks for all**: interactive ebooks can be designed to be accessible to a broader audience of readers, where special needs due to disabilities or leaning difficulties are simply handle as personalized features.

• **Ebooks publishers and research on ebook**: are these two separated worlds? Why? How to put them in contact? How to involve publishers in the research process? How to disseminate the research results?

• **Teaching and research on ebooks**: although ebooks can be effective tools for educational purposes and although teachers are one of the main stakeholders in the ebook design process, teaching and research are still seen as two distinct worlds. How can we achieve a more fruitful synergy?

**References**


