Picturebooks Go Digital – The Potential of Story Apps for the Primary EFL Classroom
Sonja Brunsmeier and Annika Kolb

Abstract
Storytelling and reading picturebooks are widespread activities in the primary EFL classroom. Generally, it is the teacher who reads most of the texts to the students: independent reading is less common in primary school classrooms. Many primary teachers are concerned that independent reading would be too difficult for their students and would lead to incorrect pronunciation. However, studies investigating the use of written language and extensive reading in the primary EFL classroom show that this teacher-centred approach to reading picturebooks does not fully exploit the language learning potential they offer. Story apps offer new opportunities for reading in a foreign language: their multi-modal nature facilitates the reading process. They offer innovative spaces for reader-text interaction that can help the reader understand the story, learn vocabulary and develop reading strategies. Based on the results of an action-research project, this paper explores the benefits of story apps for the primary EFL classroom and presents criteria for the selection of appropriate story apps for extensive reading settings.

Key words: Story Apps, picturebooks, extensive reading, reading strategies, primary school, action research, young learners

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Introduction
Picturebooks have always been one of the cornerstones of early foreign language teaching due to their popularity with children, the linguistic features they contain that support language acquisition, and the opportunities they offer for introducing children to the world of literature (Bland, 2013; Mourão, 2015). However, classroom observation and recommendations in teachers’ guides seem to indicate that picturebooks are almost exclusively presented to the children by the teacher, who supports understanding with pictures, mime and gestures. Children are hardly ever given the chance to explore a picturebook on their own.

Digital literature, such as story apps, seem to have the potential to support children’s independent reading, for they enhance the written text with spoken language. They use multimedia features such as illustrations, animations and sounds, and allow the reader to interact. Story apps are the latest way of putting picturebooks onto the screen. Multimedia and interactive features were already a characteristic of the first digital picturebooks on CD-ROMs in the 1990s, and in later online ‘Living Books’ (Bus, Takacs & Kegel, 2015). Occasionally, these multimedia stories have been used in education (e.g. de Jong & Bus, 2003; Bus, Verhallen & De Jong, 2014). The spread of mobile devices has brought about an enormous growth in the number and availability of electronic stories and story apps. They are now increasingly part of children’s daily lives. This raises the question to what extent they can support reading in a foreign language.

This paper will present a research project on the potential of story apps for independent reading scenarios in primary English as a Foreign Language (EFL) classrooms. Student interviews and the classroom videos of children reading will be analysed to discover which features of story apps are helpful to support children’s text comprehension when reading independently.

Reading and Literature in Primary EFL
The infrequent use of independent reading is mainly due to some practitioners’ hesitant attitude towards the integration of written language in primary EFL (in most parts of Germany: children from 6-10 years). Many teachers are concerned that independent reading would be too difficult for their students and would lead to incorrect pronunciation.
In Germany, where the present study was conducted, the role of the written language has long been the focus of controversial discussion. Teachers have only recently started to include reading and writing in their teaching, following the encouraging research results on the integration of written language in primary EFL classrooms (e.g. Joeckel, 2016; Rymarczyck & Diehr, 2010). Another obstacle can be the lack of availability of suitable texts in the classroom, since independent reading requires a sufficient number and variety of books to allow for individual choices.

One approach that gives students access to a variety of reading material is the extensive reading concept (Day, 2011; Day & Bamford, 2002) in which students are given a choice of reading material and read individually and at their own pace. The aim of extensive reading is to encourage reading for pleasure and enjoyment. Research on the effect of extensive reading has revealed promising results in students’ reading motivation, reading fluency and the development of reading literacy (e.g. Biebricher, 2008; Hermes, 2009; Krashen, 2013; Kreft & Viebrock, 2014). While most projects have been carried out in secondary schools, first attempts with this approach at primary level seem to confirm these findings: in a three-week extensive reading project with children, Kolb (2013) showed that even primary students are able to explore picturebooks on their own and thereby develop reading strategies and reading competences. As Kolb suggests, picturebooks are particularly suitable in an extensive reading setting because of their interplay of language and pictures that allows young readers to overcome linguistic difficulties (Kolb, 2013, p. 35). However, one problem that the project brought to light was that the children very often relied on reading aloud as a comprehension strategy. When reading aloud to a partner, their lack of experience with written English and the obscure phoneme-grapheme correspondence proved to be a challenge:

Although poor oral reading skills can go along with good reading comprehension results and therefore the wrong pronunciation does not automatically hinder the comprehension […], this strategy did prevent the students from understanding the texts when they tried to read the book to each other with one partner lacking the opportunity to see the written form. (Kolb, 2013, p. 37)
Independent reading might be more successful if the children did not read aloud themselves. Story apps may be helpful here since they very often have a 'read to me' function, providing an oral version of both the narrative parts and the dialogues of the stories. Furthermore, story apps come with a variety of interactive features opening up new opportunities for reading in a foreign language. Some of these will be presented in the next section.

**Story Apps**

Story apps are a form of digital literature, the name coming from the term Application Software. They combine verbal and visual modes, thereby ‘expanding to include auditory, tactile, and performative dimensions’ (Al-Yaqout & Nikolajeva, 2015, p. 1). Animations, music and background noises are added to the pictures and the words in the story. Frequently the reader can activate these by clicking on or touching a hotspot on the screen. Written language is supported by oral language, and words and paragraphs that are being read aloud are very often highlighted. Readers can navigate using scroll-down menus to skip to specific pages or points in the story, or to have text reread. Many story apps offer multiple modes of interaction, requiring the reader to complete tasks necessary for the progress of the story or even let the reader choose characters, settings or story paths (Bircher, 2012; Cahill & McGill-Franzen, 2013; Stichnothe, 2014, Turrión, 2015, Yokota, 2015).

Some researchers of L1 literacy have high hopes of story apps: ‘E-books have the potential to change the way our students read and consume text because of their interactivity and convenience’ (Ruetschlin Schugar, Smith & Schugar 2013, p. 615) – ‘Bringing children’s literature to life in new and exciting ways’ (Koss, 2013/14) – ‘Reinventing the book for the digital age’ (Bajarin, 2013) are cases in point. Although these statements sound very optimistic, investigations are just starting to explore which features of story apps can actually support understanding. First studies with electronic stories confirm that they can increase reading motivation and lead to greater involvement with the text (Ciampa, 2012; Ertem, 2010; Manresa, 2015). Animations, music and sound seem to support word and text comprehension as they help children to link relevant details in images with textual information:
In living books visual elements that are normally compressed into just one static illustration are instead split into several smaller portions, each representing one element of the narration. By synchronising phrases in the narration with portions of the picture there is a higher probability that connections will be made between words and non-verbal information. (Bus et al., 2009, p. 17)

For this, the text and images need to match, and be presented simultaneously (Bus et al., 2015, p 92; Smeets & Bus, 201, p. 179; Takcs et al., 2015, p. 3). Similarly, interactive features like puzzles, tasks the reader is asked to complete, visual or sound effects and word labels can support the understanding of the story if they are closely connected to the information that is presented in the text (Korat et al., 2013; Miller & Warschauer, 2014, Smeets & Bus, 2013, 2014; Verhallen et al., 2006; Verhallen & Bus, 2010). However, they can also easily distract students from the content of the stories if they interrupt the flow of reading. In such cases, the children focus their attention on trying out hotspots that are irrelevant to the text and this leads to cognitive overload (Bus et al., 2015).

Story comprehension and playing with hotspots or games are two fundamentally different tasks, even when their content is related, and carrying out both requires task switching. On the other hand, the more closely related the story and the interactive additions are, the smaller the cognitive cost of switching between the two tasks is. (Takacs et al., 2015, p. 4)

While most of these studies have been conducted with first language learners, there is currently little research available on how children can benefit from story apps in a foreign language-learning context.

**Methodology**

The study reported here uses a qualitative research design. It investigates which features of story apps can support children’s understanding in an extensive reading setting in primary
EFL. Two action research cycles (Burns, 2010) have been conducted so far. The data presented in this article was collected in the school years 2014/2015 and 2015/2016.

Research Context
The English Book Club is a voluntary afternoon programme that takes place once a week (60 minutes) for third and fourth graders (children between the ages of 8 and 11) at a German primary school. The children had been learning English since grade one with two 45-minute sessions each week. In an extensive reading setting the children were offered a variety of story apps. They chose the story apps they wanted to read – in most cases with a partner. Each story app is accompanied by pre- and post-reading activities that focus on aspects of the content and language of the story apps. Further, the children were asked to note the main facts about the story (e.g. summary of the content, author, setting and characters) in a ‘story map’. Finally the children were asked for their opinion on the story.

Data Collection and Analysis
The study used a variety of data collection methods to find out which features of the story apps the children benefit from during the reading processes. In a qualitative study, the triangulation of data increases the validity of research results and provides a broader picture of the issues investigated (Hood, 2009, pp. 80-82). Video recordings served to document which features of the story apps the children used. Since most children chose to work with a partner, the video recordings captured the interactions between the young learners. As well as their discussions, the cameras also documented the children’s actions (their non-verbal behaviour) and contextual information (what is on the screen, and what the children do with the story apps). Since video recordings do not give explicit insights into the children’s thoughts and their mental actions, the young learners were interviewed about their reading experiences at the end of each school year. The children were asked to talk about their reading experiences and encouraged to give reasons for the course of actions they took while reading the story apps. Hence, the interviews shed light on the young learners’ perspectives and experiences of the reading processes. In addition, the pupils’ worksheets provide valuable insights into the children’s evaluation of the story
apps and their level of comprehension. Figure 1 provides an overview of the research design.

![Research design](image)

**Figure 1: Research design**

The video recordings, the interviews and the children’s worksheets were analyzed using Qualitative Content Analysis (Mayring, 2014). While the interviews were analyzed after they had been transcribed completely, software for qualitative data analysis allowed for the categorization of the video data without prior transcription. As a result, interesting sequences were identified which were then transcribed and underwent a detailed sequential analysis.

**Results: Features of Story Apps that Support Understanding**

In this study, we try to identify features of story apps that support the understanding of the stories. So far we have found four main elements that helped the young learners derive
meaning from the texts: audio narration, animation and sound, vocabulary support, and reader participation and co-creation. For each of these elements, we were then able to identify features that were particularly beneficial. Our findings are illustrated with examples from different story apps, excerpts from student interviews and transcripts from videos of the children reading. In the transcripts of the children’s interviews and videos the English translation of their comments in German is given in square brackets.

Audio Narration

Audio narration refers to the ‘read-to-me’ function. This allows readers to choose whether they want to read the story by themselves or hear an oral version of the narrative passages and the dialogues, very often presented by different speakers. This way the children can hear how the words are pronounced, connect spoken and written language and differentiate between various characters. This function appeared to be very valuable for the children: 

Wir lesen besser, da wir das hören, was die uns sagen, die von iPad drinnen, von die Buch. [We read better, because we hear what they tell us, the ones that are inside the iPad, in the book.] (Viktor, 15.07.15). In some story apps, the words or sentences are highlighted while they are being read out. This made it easier for beginning readers to follow the text and led the children’s attention towards the written language.

Audio narration seems to be especially helpful if it is reader-activated, that is if the children can choose when to start being read to. This gives them control over their reading process and helps them to match written and spoken language at their own pace. They also very much appreciated being able to repeat individual words or sentences. One young learner commented:

Man kann, wenn man ein Wort nicht versteht, nicht verstanden hat, nochmal drauf drücken und dann sagt er es nochmal. [You can, if you did not understand a word, you can press on the word again and then he says it again.]

(Leon, 15.07.15)

To fully exploit engagement with the written text, the children needed the on-screen text to remain longer on the screen after it was read aloud:
Bei manchen Apps ist ja auch das bei der Schrift dann immer verschwunden und dann konnte ich halt nicht mehr lesen. (Mitschüler/in stimmt zu). Weil ich bin ja auch nicht so schnell. [In some of the apps, the written text disappeared and I could not read the text again (classmate confirms), because I’m just not that fast.] (Luise, 15.07.15)

The children needed some time to make the connection between the written and the spoken language and should ideally have the chance to go back to specific words and phrases in the text to benefit from the support provided by the combination of written and spoken text.

**Animation and Sound**

Through animation and sound, story apps offer innovative ways of displaying actions and events. For example, one student described the congruency between the actions described in the text and the ones displayed on the screen that are triggered by the reader’s interaction in the *The Three Little Pigs* story app:

*Zum Beispiel bei ‘The Three Little Pigs’ musste man dann auf Holz zum Beispiel drücken und dann bauen sie ein Haus.* [For example, in the story app *The Three Little Pigs* we could press on the logs and then they built a house.] (Leon, 15.07.15)

Not only do these features increase the readers’ involvement with the story, the children also seemed to enjoy the act of creation in which they take part (see also ‘reader-participation and co-creation’ below).

Another example of the rich variety of ways in which the device can show events is in *Pete’s Robot*, where the event: ‘The robot could see in colour for the first time’ is conveyed by a screen which is initially black and white and which turns to a coloured picture if you shake the device. These features proved to significantly support understanding, as many children confirmed in the interviews:
Weil man sieht ja auch, ja der macht das jetzt. [Because you actually see, yes, that’s what he’s doing now.] (Lena, 21.06.16)

Zum Beispiel steht dort 'Die Äste bewegten sich vom Baum' und das ist eben dann auf Englisch dort geschrieben und dann wird das im Bild dargestellt, wie der Ast so sich bewegt. [It says, for example: ‘The branches of the tree were moving’ and that then is written in English and then the picture shows the branch moving.] (Colin, 15.07.15)

Weil man ist da auch aufmerksamer, weil da was passiert auf dem Bildschirm [Because you’re more attentive there, since something is happening on the screen.] (Simon, 19.03.16)

The children attributed two major functions to the animations: they helped them to derive meaning from the text as a whole, since they combined linguistic and visual information, and the interplay of pictures and text allowed the children to understand individual new words from the context. In addition, animations helped to focus their attention on specific elements and characters on the screen.

Animations and sounds are particularly supportive for understanding under certain circumstances. As with audio narration, the children found animations very helpful when they were reader-activated, as this student explained from his experience with the story app *The Three Little Pigs*:

Es hat dann geholfen, dass man die Bilder auch so gut bewegen kann. Wenn man sie berührt dann haben sie zum Beispiel ihr Haus angefangen zu bauen. [It was of great help that you could move the pictures so well. Once you touch the characters they start to build a house.] (Louis, 13.04.15)

Another aspect that could either support or hinder understanding was the timing of the animations. Animations that could be activated before the text of the slide had been read aloud in full often led the children to start these and focus their attention on the animations and actions rather than on reading and listening to the text. Moreover, it was very important that the different sources of information (words, pictures, movement,
sound) corresponded to each other. Many story apps feature reader-activated animations that do not contribute to the understanding of the story, as this student noted:

Pupil: Bei ‘Three Little Pigs’ fand ich was geil. Habe ich was Cooles herausgefunden. Wenn man auf die Leute tippt und dann hochzieht, dann können die Saltos machen. [I found out something wicked, really cool when I read the Three Little Pigs. When you tap on the characters and drag them, they can do somersaults.]

Interviewer: Aber hilft dir das beim Verstehen? [Does this help you to understand the story?]

S: Nee, aber fand ich cool. [No, but it was cool.] (Leon, 15.07.15)

As a consequence, animations and sounds proved to be a decisive criterion for selecting appropriate story apps since these features could either support or distract from the understanding of the story.

Figure 2: Start screen of The Three Little Pigs (Nosy Crow & Bryan, 2015)
Vocabulary Support
Although story apps so far have not been developed for foreign language learners, some offer explicit vocabulary support by labeling pictures: written words appear next to objects and characters in pictures. This helps the reader derive meaning from the text and draw inferences. This kind of vocabulary support is usually reader-activated – the words appear if the reader taps on a specific place in the picture. It proved to be especially helpful for the children if the words showed up right next to the relevant object and could therefore be unambiguously matched. It was also most helpful for text comprehension if the words shown actually appeared in the text. Additional words provided additional language input but could also distract the young learners from the text.

Reader Participation and Co-Creation
Interactive features of story apps frequently allow the reader to participate in and co-create the story. Readers can personalize the story with their own photos, drawings or audio recordings. In some story apps, they can decide on the amount of language they want the characters to produce. Interactive elements are used as narrative tools (Bircher, 2012, p. 73). The story apps integrate hotspots, games and choices regarding, for example, characters, and settings, or tasks that the reader has to accomplish to be able to progress in the story. Readers might even influence the plot. The children quickly understood this mechanism, as the following statement shows:

"Damit man weiterkommt. Man muss erstmal so eine Aufgabe machen und wenn sie richtig gemacht wurde, ist da so ein Pfeil, auf den drückt man und dann kommt man halt weiter (...) Zum Beispiel bei ‘Nash Smasher’, da musste man so eine Burg kaputt machen und dann musste man halt so eine Linie ziehen und dann hat er mit dem Hammer so eine Burg zerstört und das musste man öfter machen, bis die Burg kaputt gegangen ist. [To proceed with the story we had to accomplish a task. If you complete it successfully there is an arrow, which you have to press and then you can continue. For example, in the story app Nash Smasher we had to destroy a castle. We had to draw a line and then Nash
smashes a castle with a hammer. We had to do that a number of times until the
castle was completely destroyed.] (Sascha, 15.07.15)

This feature leads to active involvement and identification with the story. For example, in the *The Three Little Pigs* story app, the children could help the wolf blow down the three little pigs’ houses. The harder they puffed into the tablet’s microphone the more successful the wolf was. While doing this, one of the learners said: *Wir sind gemein* [We’re mean] (Noah, V2 17.06.15), which shows that the children had become players in the story and identified with the wolf. Mourão (2016) who has adapted Sipe’s (2008) categories of response to literature for the EFL classroom describes this as a transparent response. The children react ‘as though they were living the story for real’ (Mourão 2016, p. 35). Another learner compared himself with a character who does not feel comfortable on a roller coaster ride in the *My Dad Drives a Roller Coaster Car* story app: *Oh, der ist schlecht, wie mir. Mir ist auch schlecht.* [Oh, she feels sick, just like me. I feel sick too.] (Philipp, V2 24.06.15).

Several incidents in the videos showed that the children related to characters in the stories. While reading how the three little pigs played soccer, demonstrating how often they could bounce a football on their foot, one child gave a personal response: *Da kann man Fußball [spielen]. Das habe ich auch. Was ist dein Rekord im Hochheben? Meiner ist 38.* [They can play soccer. I can also play soccer. What is your ball-bouncing record? Mine is 38.] (Fabian, V2 24.06.15).

The opportunity to participate as a player in the story also provides an opportunity to check comprehension at various points in the reading process. In the *Jack and the Beanstalk* story app, the readers are asked to put a particular coloured vegetable into the soup. On task completion they get immediate feedback on their performance, a feature that is particularly relevant for beginning language learners. Another opportunity these options afford is that they allow for individual reading experiences regarding the content and the language of the stories. In the *Dino Boy* story app, children can choose between different pets according to their preferences and can make certain decisions concerning the plot. Various story apps allow readers to determine the amount of language input they would like to cope with, thereby catering for heterogeneous groups of learners.
As with reader-activated animations, tasks and activities that readers are asked to do in story apps only support understanding if they make sense in the context of the story (like destroying a castle in *Nash Smasher* or getting a dress in *Cinderella’s Sister*) and do not distract learners from the storyline. Unfortunately, this is not always the case (see also section ‘animation and sound’). Many story apps feature ‘bells and whistles’ (Smeets & Bus 2013, p. 178) that trigger children’s curiosity but lead them away from the story without contributing any useful information to the plot.

**Summary and Discussion: Benefits and Challenges of Story Apps**

In line with previous studies on electronic and digital stories, the data from these primary EFL classrooms showed that beginning young learners can benefit from audio narration, animation and sounds, vocabulary support and the opportunity to participate in and co-create the story in story apps. In addition, the student interviews, video recordings and learner text allowed us to identify specific features of these elements of story apps that either supported or hindered the reading process.

Audio narration proved to be especially helpful if the readers can determine for themselves when it starts, can repeat specific passages of their choice and if the written text stays on after it has been read out to facilitate the connection between written and spoken language. Animations and sounds help the children to understand the stories if they are closely related to the textual information, can only be started after the text has been read aloud and can be activated by the readers themselves. Explicit vocabulary support should be unambiguous and should be restricted to words that are actually necessary to understand the story, otherwise it can distract the children. Reader participation and co-creation allows for enhanced engagement with the text and a high level of identification with the stories, provided that the activities readers are asked to complete have a genuine function in the story.

A feature that seemed to be relevant across all elements of story apps was the aspect of agency. Al-Yaqout and Nikolajeva (2015, n.p.) put it at the centre of the reading experience with story apps:
The word / image counterpoint, essential in any picturebook, requires the user’s action, providing them with stronger agency. Tapping, touching and tracing become embodied actions to reading and viewing that enhances the user’s affective engagement.

In this study, the children claimed that being active and interacting with the story app not only helped them to get involved in the story but also to be in control of their own reading process. They wanted to determine the moment when the reading aloud and animations started, they wanted to get back to parts of the text they did not understand the first time, and they appreciated having an influence on the content and language of the story. The children very happily accepted an active role in the reading process and they made use of the opportunities to adapt the story apps to their individual needs.

The stimulating nature of the apps, on the other hand, is perhaps the biggest challenge they might pose for the EFL classroom. While nearly all story apps offer opportunities for interaction, the kind of participation offered does not support understanding in all cases. Turrión (2004, p. 4) suggests a helpful classification:

Real participation stands for an interactive proposal in which the action of the user works in a necessary cause-effect relationship with the story. Simulative participation occurs when the user’s action produces an effect in the story that would appear equally even if he or she did not trigger the hot spot. False participation refers to cases where the effect of the user’s action is repetitive or meaningless for the development of the story.

In this study, ‘false participation’ proved to be very attractive for the children as well. In many cases it distracted them from the story. One way of re-focusing their attention was through tasks and activities requiring that they deal with specific aspects of the story and making it necessary to engage with the language of the text.
Conclusion

On the basis of these results, story apps can help develop reading competence in various ways:

**To support independent reading.** The audio narration can help avoid problems with pronunciation that otherwise significantly hindered the young learners when reading independently. Further research could look into to what extent the possibility of matching spoken and written language raises children’s orthographic awareness and helps develop reading fluency. Independent reading is also supported by the opportunity for individual reading experiences (amount of language input and support desired). Primary children seem to be at least partially aware of their needs; they are able to take control of their own reading processes and can adapt the material accordingly.

**To develop reading strategies.** The multimodal nature of story apps significantly supports beginning foreign language learners in making meaning from the text. Animations and sounds help learners to cope with unknown vocabulary and focus on important aspects of the plot. Using these sources of information fosters strategies such as reading for gist and making predictions. Further research should take a closer look at children’s reading processes when reading multimodal texts to find out exactly how the interplay between the different modes works and can be supported.

**To foster reading motivation.** Our data and previous studies show that interactive features of digital stories lead to increased engagement with the text. The game-like features and support offered by story apps could help to win over reluctant readers to overcome barriers related to print books. However, since in this study, and most other studies on the topic, reading story apps was a new experience for the children, long-term studies have yet to find out whether these effects wear off after some time of exposure to story apps.

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