TOOLKIT for TEACHERS

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Practical tips to help teachers use Apps for Fluency in the Classroom

I – 1 Introduction, why this Toolkit?

We live in the information age. We can access information anywhere and everywhere, 24 hours non-stop. Gone are the days of waiting for books you ordered in the library, or having to find the right specialist to give you information on particular subjects. Open your browser and the World Wide Web is your Oyster! Trusted or non-trusted sources, fake news or factual, we can no longer be sure, but on we go, searching, posting, sharing away on our permanently present multiple screens.

For teachers, having this wealth of information is both a blessing and a curse. Having so much material at the touch of a button has obvious advantages, but too much information easily creates an overload and we can quickly lose focus on what is important. However, on the up side, our pupils can now be exposed to so many different ways of learning: White boards, tablets, PC's and even mobile phones present a wealth of possibilities facilitating audio-visual and tactile ways of processing knowledge, all of which we could not have dreamt of even ten years ago. Technological developments provide opportunities for differentiation and thereby more inclusive education.

Most of us are frequent users of IT, yet despite having totally transformed the way we communicate and handle information in our everyday lives, making IT tools part of our teaching is not common practice. Part of the explanation could be that teachers often lack time and expertise to see the wood for the trees on what is on offer. Another contributing factor is that many teachers have not been trained to integrate IT into the classroom.

The result is that IT tools, despite being a wonderful resource, are underused in education. The use of good quality reading Apps in schools is not different in this context. So many commercial and non-commercial Apps are on the market and it is hard to know which ones to choose, especially those used for remediation. With this online Toolkit we aim to support teachers in identifying good reading and spelling Apps and to create a platform where good practice can be shared. Set against the three phases in reading: decoding, fluent reading, reading with comprehension, the background of which is given in Chapter I-4, we recommend what remedial practices work and how they can be reinforced by the use of specific Apps that address the same remediation techniques in Chapter II-3.

Through short videos, teachers from Belgium, Czech Republic, The Netherlands and the United Kingdom show how they have worked with Apps for a particular child or particular group of children as an inspiration to other teachers in their country or abroad. Furthermore, tips are given for classroom organisation: teachers from all 4 countries give practical classroom ideas of how to organise the space and how to diversify successfully in a classroom setting.

I – 2 Why the A is for App Project?

A is for App, an Erasmus Plus Project to help Struggling Readers and their Teachers

In the context of our A is for App Erasmus Plus Project, our European team of teachers, school directors, professors and speech therapists from Belgium, the Czech Republic, the United Kingdom and the Netherlands have conducted a review of existing literacy apps and pilot tested the higher quality apps, collecting user experiences from struggling readers who are in the second phase of reading development. In a very practical way, the results of our randomised trials with Apps in over 10 schools in 4 countries, the background theory to reading development and the filmed experiences of teachers using apps in the classroom is captured in an online Teacher Toolkit for all teachers to consult and converse with.

Our target group consists of children who are in the so called "orthographic phase". With the help of cutting edge (gaming) apps, we aim to get children to read a growing set of sight words and to have them recognize words faster and faster so that they will become fluent readers. With the help of the online Toolkit for teachers, we aim to help teachers to transform their struggling readers into fluent readers, able to read aloud accurately with correct pace and prosody increasing the comprehension skills as they go along, which modern day pedagogy is working on from the early reading development stages. The ultimate aim is to get children to learn to read so they can read to learn and in the best case read for fun.

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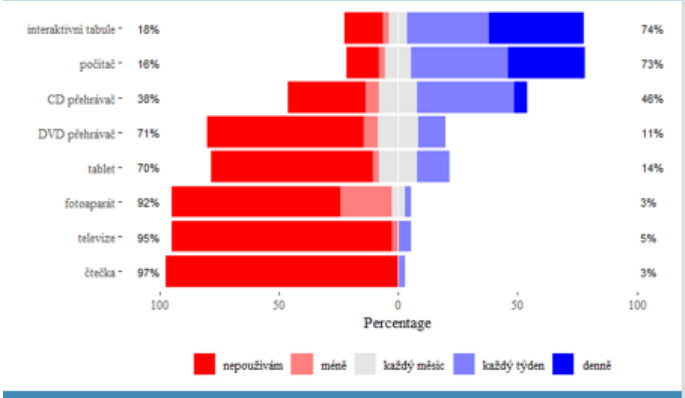
According to the EU High Level Report "*One in five 15 year-olds, lack basic reading and writing skills*". These findings tie in with EU Member States' reports on low-literate adolescents and adults. A specific group of people struggling with literacy are those with dyslexia though individuals can struggle to read for other reasons too. Whatever the cause, it is essential for poor readers to be exposed to sufficient literacy tools to reduce the literacy skill gap and to remediate reading difficulties.

There is a move towards inclusive education in EU countries. This means that increasingly, teachers are expected to accommodate heterogeneous groups in their classrooms. Pressure on teachers rises with increased demands on their time, skill sets, creativity and resources, and supporting their pupils in achieving curriculum targets. Good use of appropriate and tailor-made (digital) tools is essential in this respect; these tools support children's progress. In our research for the A is for App project, we found out that despite the fact that many of us use technology in our lives, the IT tools do not enter the classroom. This is often because it is hard to know which Apps to use, there are so many and the quality is not always guaranteed, or because we don't know how to organise our classrooms so that IT can be integrated in lessons. Our Teacher Toolkit addresses the causes of this phenomenon and offers practical video guidance to encourage teachers to use IT for reading in each of the three phases in reading development.

During the last phase of the project, an analysis will be made of apps that work. Moreover, elements that have proved to be highly effective in terms of bringing on the reading skills of struggling readers will be identified and help teachers in finding effective apps as well as leading the way for more innovation on literacy apps for struggling readers in the future.

In the short and long term, this project benefits struggling readers, teachers, researchers on literacy, parents and developers of IT tools for literacy.

I – 3 Frequency of IT use in the class



OUTCOMES FROM CZECH TEACHERS
- our starting point?

The frequency of IT use in class (smartboard, PC, CD-player, DVD-player, tablet, camera, TV, e-reader)

SUMMARY OF FURTHER RESULTS

- Reading fluency is mostly trained in the 3rd and 4th grade.
- More than half of respondents use ICT to encourage pupils' reading – usually once a week or less.
- Reasons for not using ICT – lack of information, lack of professional support, poor technical support and equipment, expensive…
- Most of respondents believe they are able to organize lessons with ICT.
- Respondents usually seek information on ICT, attend in-service training, are interested in ICT.
- Respondents require modern equipment, support, supervision, discussions with colleagues and experts.

I – 4 Three Phases in Reading: Decoding, Fluent Reading, Reading with Comprehension - Background theory

Learning to speak and learning to read

Learning to speak and learning to read are closely related, yet completely different processes. As children, most of us learn to speak without having to make any special effort. From the time we are born, we communicate with the people surrounding us and gradually learn our native language(s) by doing just that.

Learning to read does not come to us naturally, we need to be taught by our teachers at primary school. On our path to reading, the first hurdle we cross is cracking the code that transforms written words into their spoken form. This is particularly important in the so called “alphabetic orthographies”, languages where spelling is typified by a relation between letters and sounds, such as for example in the word “pen”.

Being an accurate and fluent reader is one of the main goals we want children to have reached by the time they finish primary school. Children go through several stages of reading development and learn different reading strategies. They start with sounding out written words. Most children pass through this phase relatively fast. During the next stages of development, children will learn to read while focusing on content, followed by being able to comprehend what they are reading and hopefully ending up by enjoying the experience.

Once children reach a level of reading that allows true comprehension, they have mastered the basis for learning any other academic subject. Being a proficient reader is almost essential for becoming an active member of society, enables lifelong learning, cultural participation and being successful in the job market.

Teachers are key professionals supporting children in their journey to becoming fluent readers. This “Teacher Toolkit” focuses on how Apps can be useful tools in giving this support, especially for children who are struggling readers. This chapter gives an overview of the different stages in reading development, which teachers can use as background when selecting good quality apps for reading fluency. Chapter II-2 will link developmental processes with remediation techniques and Apps that we recommend for remediation.

Stage 0 - Reading before having learnt to read

Back to reading development in its various stages. Before formal reading instruction starts, children already recognize a small amount of words in a pictorial way. They have learned to recognize names or familiar brands, without having been taught or without having discovered the alphabetic principles of their language. This *logographic phase* of reading, as Uta Frith calls it, is a preparatory stage before real reading development.

Discerning small units of sound

We can speak of real reading when children learn that speech sounds are represented by (a combination of) letters. Learning to converse graphemes (the written form of speech sounds, formed by letters or letter combinations, such as for example “th”) into phonemes (the smallest units of sound that differentiate words from one another, such as for example the “m” and “b” in the words “mad” and “bad”) is the necessary first step.

Children have to learn how to decode a word by transforming every grapheme into the phoneme it represents and assembling them into the spoken form of the word. In order to do this, they need to be able to discriminate between the different graphemes (that sometimes strongly resemble each other, e.g. b/d or u/n or f/t) and phonemes, to know the letter-sound correspondences, and to assemble them (i.e. 'blending' or 'auditory synthesis').

Phase 1 - Decoding, the main strategy for reading – the alphabetic phase

Transforming graphemes into phonemes and blending them is the basic reading act and is called (sequential) '**decoding**'. It is the main strategy involved in the *alphabetic phase* of reading development. Sequential decoding is highly sufficient for reading *regular words* that are spelled completely according to the alphabetic principle of the language. For regular words, the correspondence between the graphemes and the phonemes is unequivocal. In languages with a completely transparent orthography all words are regularly written. However, most languages have a number of *irregular words*, where the written form of the word cannot be read by using the grapheme-phoneme correspondence rules of that language. Languages with a so-called opaque orthography have a big amount of irregular words. Thus, all alphabetic languages can be positioned on a continuum going from extremely transparent, like Finnish of Spanish, to very opaque, like English. Dutch is situated somewhere in the middle of that continuum. Czech is more transparent.

Despite this differentiation in orthographies (spelling-sound relations), research has shown that learning to read should always start with the **decoding strategy**, i.e. learning the grapheme-phoneme correspondences (letter knowledge) and blending, in both transparent and opaque orthographies. Learning to decode starts with conversing the smallest units of words (individual graphemes) into the corresponding phonemes, such as for example "pot" to /p/ /o/ /t/, and blend them, for example to /pot/. Through practice children learn to converse bigger units (e.g. consonant clusters, specific grapheme groups, rhymes, roots, prefixes and suffixes, etc.) into their corresponding sounds. Being able to read these bigger units is necessary to become a skilled reader. The conversion of bigger grapheme units makes reading of irregular words possible.

Repetition, repetition, repetition leading to phase 2: word recognition- the orthographic phase

Repeated decoding practice will lead to the recognition of whole words (of increasing length) and children in this phase will develop a new strategy: **direct word recognition**. Via a self-teaching mechanism, repeated decoding practice results in whole words being stored as an orthographic unit (sight word) in long term memory (the *mental lexicon*) with a direct link to how their sound (their phonological representation) and some other language aspects (e.g. meaning, morphological structure, etc.). This *orthographic phase* in reading development is characterized by children having a growing set of sight words, which they will recognize faster and faster.

While *accuracy* is the central goal of the alphabetic phase, *speed* is strived for in this orthographic phase. Accurate word recognition at an increasingly fast pace should characterize this phase of learning to read. Practice by means of repeated reading is the way to achieve this. The amount of reading is directly linked to the magnitude of the orthographic lexicon that a child will typically develop at this stage. Flashed reading, i.e. recognizing words that are only shown for short instances, is a good way of specifically exercising word recognition speed. The goal of this orthographic phase is for the child to end up recognizing words automatically.

Phase 3 - anticipated reading or **reduced word recognition leading to fluent reading**

When word recognition is embedded in text reading, a third reading strategy is developing, making use of the context and meaning of the text. It is sometimes called **anticipated reading** or **reduced word recognition**, being able to recognize the words without necessarily using all written information. This top-down processing is only possible if direct word recognition is automatized enough to make attention available for the content of what is being read and to analyze the links between words in the text. Anticipated reading helps in making reading *fluent*. A fluent reader can be characterized as being able to read aloud accurately with correct pace and prosody. Moreover, reading fluency is supporting reading comprehension, which of course is the ultimate goal of mastering reading. Learning to read in this phase is facilitating reading to learn (and reading for fun). When teachers offer direct instruction by means of comprehension strategies, and help to enrich the children's vocabulary and content knowledge they are contributing to the development of their reading comprehension.

Although the three reading strategies develop in successive phases, each one building on the other, the skilled reader keeps on using all three strategies. Sublexical decoding will be used when confronted with unknown words (e.g. 'surreptitious') or names (e.g. 'Pavel Fyodorovich Smerdyakov'). But repeated reading of these words will eventually install direct word recognition. And when used in a familiar context these words will probably be read by reduced word recognition after a while. So, in all phases reading an interactive process of different strategies is used.

Sources

- Dehaene, S. (2009). *Reading in the brain. The new science of how we read.* New York: Penguin Books.
- Ghesquière, P. & Van der Leij, A. (2016). Technisch lezen en spellen. –In: K. Verschueren & H. Koomen (red.), *Handboek diagnostiek in de leerlingenbegeleiding. Kind en context* (pp. 71-91). Antwerpen-Apeldoorn: Garant.
- Grigorenko, E.L. & Naples, A.J. (eds) (2008). *Single-word reading. Behavioral and biological perspectives.* New York: Lawrence Erlbaum Associates.
- Van der Leij, A. (1998). *Leesproblemen. Beschrijving, verklaring en aanpak.* Rotterdam: Lemniscaat.

I – 5 How Games help learning

Why Gaming Apps?

At the start of our A is for App project, in the Spring of 2019, we asked children of Year 4 in the Worsbrough Primary School to play with five high-quality reading fluency Apps. We interviewed the children during and after use. We learned that the more game elements the Apps had, the more popular they were with the children.

Game Didactics

We then checked the literature on gaming. We consulted a leading source on Game Didactics, "Game Didactiek" (the how and why of games in class) by Martijn Koops (2017) and discovered what gaming elements can contribute to learning.

In terms of classroom practice, research shows that:

- Gaming is considered more motivating than a traditional lesson
- Children can spend hours concentrating on a video game, whereas listening to a teacher for 20 minutes can be a problem.

What are the Key Ingredients of a Game?

Game elements have to have certain elements to make them interesting. With so many sophisticated games on the market, the gaming standards have gone up. When you are a teacher looking for a game App for your class, you should be looking for the following **FaCuCoCha** elements:

- **Fantasy**, the environment in which the children play is not real
- **Curiosity**, this motivates the children to continue playing
- **Control**, the children feel that they are having an influence on outcomes
- **Challenge**, the children get a fitting challenge, not an impossible one, they are going for a specific target and outcome, not a random one.

These 4 FaCuCoCha ingredients form the basis of what to look out for when you are deciding on a Game App. When we start to think about classroom organization and the differences in processing and learning processes, a larger checklist comes in handy with further refinements.

Below we present the advice for what is considered an attractive game followed by a checklist for apps we choose.

It all starts with choosing an attractive and recognizable goal. A goal that the player (your primary school pupils by themselves, or in a team), can go for. The player has a certain degree of autonomy and the player must be able to see the goal become more achievable during the game. The progress must be made visible. By bringing the player step by step further into the game, and at the same time gradually increasing the complexity quietly, the game designer teaches the player the tricks of the game whilst continuously providing feedback. The player is always faced with a new challenge, an obstacle that takes effort to overcome. With the help provided in the game, the player succeeds to go one step further. New levels are always unlocked and motivation is achieved by staying in the "near development zone". The "zone of near development" is the domain that the player has not yet mastered. At the same time, the challenge is not so big that the player gives up. The player is confident that the challenge is real and that he can handle this with a little help. Finally, there must

be an attractive theme, or at least an attractive layout/game environment (...) that is independent of the reality and tempts the player to go and play.

Below is a checklist for a Didactic Games:

- Restricting rules
- A target
- A Challenge
- Levels
- Feedback on progress
- Opponents, obstacles to overcome
- A fantasy world (A poker game in which you can lose your car is not a game)
- A Step by step didactic approach
- Autonomy of player
- Instilling confidence in the player so that he/she can take up the challenge
- A connection with others which helps motivation
- Constant accurate feedback so player stays in the flow (staying far enough away from frustration and boredom) (Csiks-Zentmihalyi, 1988)
- Adjusting the level of the player on the basis of individual progress made during the game
- Motivation by keeping the player in the "zone of near development" (Dutch: zone van nabije ontwikkeling), which is motivates the player to go for the next level that he/she can nearly reach.
- An attractive layout/theme
- Reinforcers – rewards on set times and variable times
- Being conscious of different types of kids, competitive and non-competitive. 4 types of players/kids can be identified according to Bartle's Graph: Killer, Achiever, Socializer, Explorer

Ratio and Intuition, how Games help to establish Automaticity

Ratio creates cognitive tension, intuition happens within cognitive ease. In other words, ratio is about thinking, intuition is about doing without having to think. We can distinguish between a **Game circle** (learning by playing, trial and error, safe environment, cognitive ease, driven by intuition) and a **Learning circle** (conscious learning, structured, acts by counting on specific knowledge). See the illustration below: 1.1 Game circles and Learning Circles.

Games allow children to practice, experience and acquire automatic skills. Knowledge without experience is not enough to make kids own the knowledge and apply it. This is where games offer a combination of working the ratio as well as the intuition, where knowledge and the application of knowledge are working together.

Cruijff (a once famous Dutch footballer with quirky sayings that became part of the Dutch Lexicon): « Je gaat het pas zien als je het doorhebt » You will only understand it when you comprehend it/see through it.

In a lesson this means:

A teacher can:

- get children to play (using their intuition) and then talk about the knowledge they used or acquired after (first experience then the debriefing on the knowledge/ rules).
- give children the knowledge/rules beforehand after which they can experience through play.

Four types of games

Games can cover:

- Knowledge
- Skills
- Understanding
- Attitude

All 4 are crucial elements for learning to read.

For Skills games, the knowledge can be introduced in the game, or having the knowledge can be a requirement to succeed in the game.

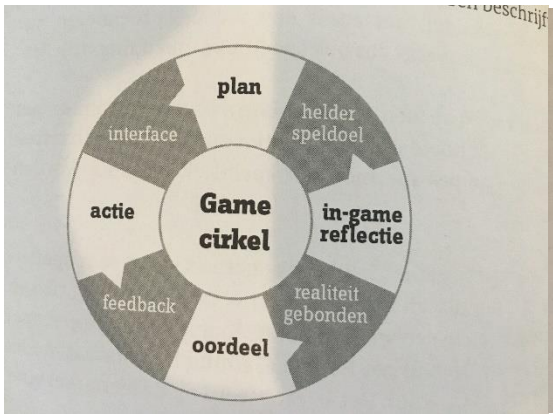
The games help the kids to move:

- From unconsciously unskilled
- to consciously unskilled
- to consciously skilled
- to unconsciously skilled.

Through play/practice, children eventually move to unconsciously skilled. Games allow you to add circumstances to increase the challenge (+ time limit, +multi-task, +learning a new skill). To this purpose, games are used in primary schools (for multiplication tables for example), increasingly in companies, but rarely in secondary education. An example of a skills game process is learning to type, the instructions/rules are no longer needed when the skill is acquired and has become automatic. In "games for understanding", the feedback you get in the game bring you on to a next level of understanding. Experience and knowledge are combined and Cruijff's quote applies: You will only understand it when you comprehend it/see through it.

Integrating a game into a lesson

Teachers need to decide when they want their pupils to learn implicitly and when explicitly and decide which games match their goals.



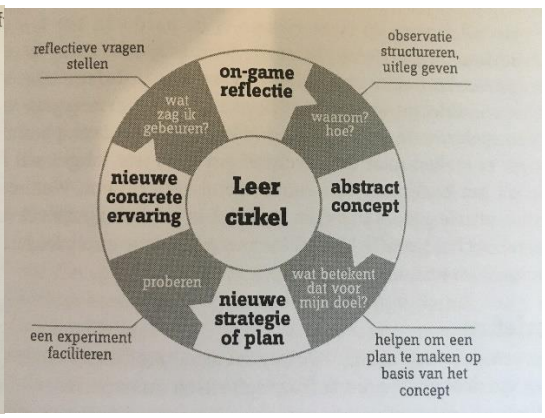


Image 1 Gamecircle Clockwise: Plan, Clear game target, in-game reflection, reality-bound, judgment, feedback, action, interface

Image 2 Learningcircle Clockwise: On game reflection, Why-how (teacher) structure the observation – give explanation, abstract concept, what does this mean for my goal (teacher) help to make a plan on the basis of the concept, new strategy or plan, try out (teacher) facilitate an experiment, concrete new experience, what shall I use (teacher) ask questions for reflection.

1.1 Game circles and Learning Circles

Dewey 1933: “We do not learn from experience, we learn from reflection on experience”

Learning from a game happens in the debriefing. Reflection should also be embedded in the game.

There are two ways of doing this:

Practice Games:

Children learn by playing the game, practicing skills. No link to knowledge is necessary at this stage. The child acquires the skill through playing.

A combination with the learning circle is possible. Reflection and Evaluation on action (example is given of sportspeople evaluating their training move videos).

Concept Games:

Children learn in the game, mastering the concept through the game. Practice and reflection are part of the game.

Teachers should identify what the game offers, and decide on where to complement the knowledge/reflection moment in their lessons. The Dynamic is flexible: Practice first or knowledge first. When kids get stuck, teachers can intervene. The debriefing should be at the end.

Source:

Game Didactiek – Martijn C. Koops,
The writer is a serious game developer whose focus is learning through games, this book is how it can help teachers, when to use games for which targets. He researched how learning and gaming go together for the last 15 years.

WHICH APP FOR WHICH CHILD?

READING DIFFICULTIES - Approaches and Apps that help

Reading phases	How do you recognize the problem?	General approach	Sub-principles approach	Which Apps help?
1. Decoding	Problems with correct word identification (accurate reading) • Poor letter knowledge • Difficulty learning letter-sound mappings, despite regular practice • Inflexible application of decoding strategies	Starting from letter knowledge and the sub-skills, building up the reading process step-by-step.	• Learning reading subskills, including letter knowledge • Learning the links between sounds and letters • Feedback on accuracy	➢ Hairy Phonics  ➢ Pocket Phonics  ➢ Teach Your Monster to Read 
2. Recognizable reading	Problems with automatic word recognition (fast reading) • Substitution of similar-looking words or word parts • Reading/recognition of single words is not automated	• Linking knowledge about word letter patterns, grammatical roots, sound patterns and meaning • Acceleration of this process to encourage automaticity	• Learn associations (see-hear) • Accelerating speeds • Feedback about speed	➢ Lexia Core5 Reading (UK) 

3. Anticipatory reading	Problems with predictive word recognition (anticipatory reading) • Difficulties with pace and intonation of reading • Incomplete use of sentence context to help correctly predict word identities	Use of the meaning of words and sentences to promote more reading of less common words	• Mobilize and implement knowledge of word parts • Learning to apply word identification strategies	➢ Lexia Core5 Reading (UK)  ➢ Epic  ➢ Reading Realm