Tools and Methods

for Interactivity in Sustainable

eLearning with eBooks

Editor: Paul Hopkins

Preface

This is the second of three interactive books that explain how teacher educators around the world are preparing the next generation of teachers to use mobile technologies to enhance and transform learning.

These interactibe books are one of the intellectual outputs of a European Erasmus+ project. This is the 'Mobilising and Transforming Teacher Education Project' and you can find out more about the project on our website at www.mttep.eu

This interactive book explores interactivity and how you can enrich your ebooks with widgets. The other books in the series explores the benefits and value of authoring your own eBooks (Book 1) and how teacher educators are using mobile technologies to support and transform their practice (Book 3).

We want you to read the book and give us Feedback at the end through the Widget on Page 77.

Your Feedback will be used to improve the books.

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Table of Contents

Tools and Methods
for interactivity in sustainable
E-Learning with eBooks

Erasmus+

Comment   Imprint

Introduction   Feedback

1 The nature of interactivity

3 Interactivity in context

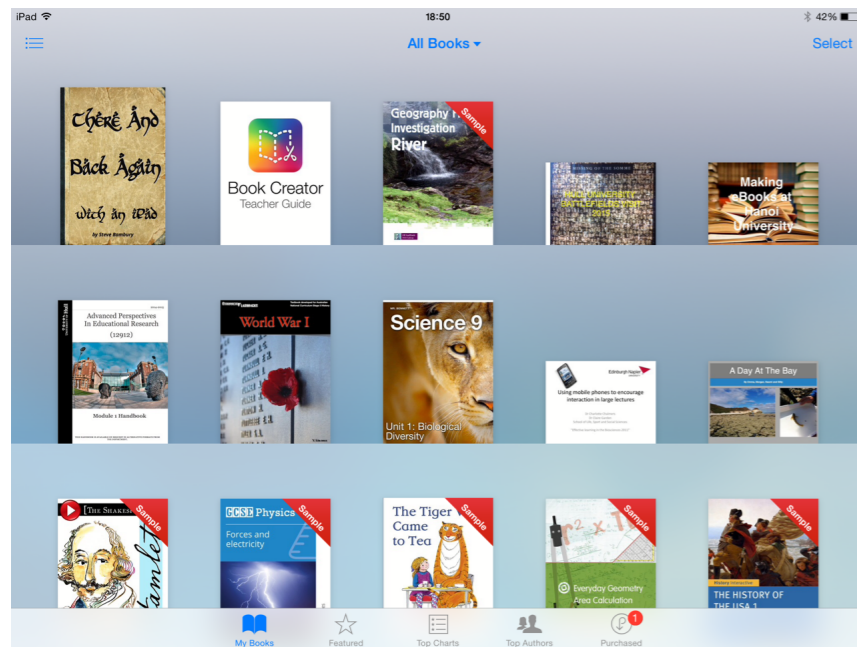**2** What applications are there are how can they be used?
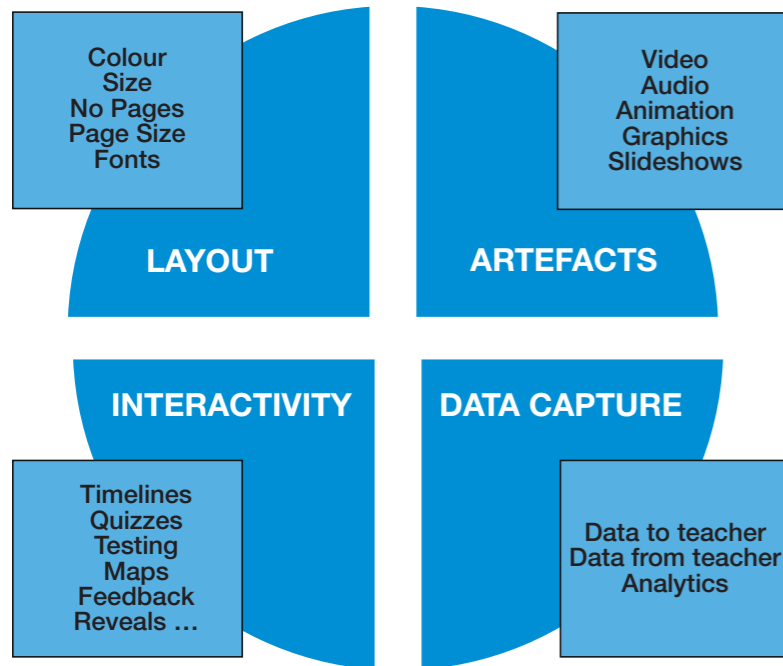
Introduction

Figure 1

The interactive eBook is in its infancy. Whilst the number of electronic books is growing very fast and Amazon now sells more electronic versions of many books than paper copies it is not clear that this will change the way that we think about, and carry out learning in our schools. Most of the electronic books that are on offer are just digitised editions of the paper textbooks that are on offer and whilst some schools are developing eBooks (an example is the Steven Perse Foundation these also tend to be 'digital print' rather than the eBook as we conceptualise it.

So, the issue is that many of these eBooks do not differ in a conceptual way from the paper books. They are still static collections of text and images that are designed to be consumer by the individual - more of a didactic or transmissive process between the creator of the book (the author) and the consumer (the reader or the child). We want to consider how books can be developed that are an interactive process between these and how these very roles can be both interchangeable and dynamic.

So we would like to make a clear definition between books which essentially are digital versions of existing print books, we might call digital-print books and those which

Key Affordances

Figure 2 Key Affordances

LAYOUT

Colour
Size
No Pages
Page Size
Fonts

ARTEFACTS

Video
Audio
Animation
Graphics
Slideshows

INTERACTIVITY

Timelines
Quizzes
Testing
Maps
Feedback
Reveals …

DATA CAPTURE

Data to teacher
Data from teacher
Analytics

have four key aspects. We are calling these eBooks.

There are four key affordances that we can think of as we develop an eBook (figure 2).

We can think of the eBook have a number of affordances or things to offer that are different from either the paper or the electronic book.

The artefacts that can be included: Alongside print and image the eBook can include video, audio, moving graphic, slideshows, animations etc… this gives the creator of the book much more scope for transmitting information, exploring ideas, demonstrating and offering learning in a variety of ways.

One simple example might be in Maths where an animation can show the decomposition method of subtraction as

a small animated movie so the words of the teacher alongside the actions that would be demonstrated can be included into the book. This can then be replayed as often as needed by the learner.

Way in which the artefacts can be organised: The layout of eBooks (those print books that have been digitised) is determined by a number of factors including print layout, text option, cost, colour, size - none of these apply to the eBook and so text can be enlarged, changed, designed and moved in a complex manner.

Feedback

In what order of importance would you place these affordances?

And all of these can be updated and corrected very quickly and simply. Alongside this is the interactivity of user feedback and co-development for improvement.

Interactivity: A number of companies are developing interactive widgets for eBooks (Bookry, Bookwidgets and Learningapp are three that we are working with); these include timelines, quizzes, overlays, drag and drop, annotate, feedback, maps, reveal etc…

As well as teachers (and other adults) developing the eBooks there are real opportunities for the pupils to become authors themselves and also engage in the wider editorial and authoring processes which apart from anything else is wonderful literacy.

Capturing Data: The eBook can capture data and then send this to the teacher - this has potential benefits around marking, assessment and feedback and as books produce data, data analytics can be used to direct learning. This is exemplified in the work of the Khan Academy and the work of Eric Mazur, among others.

In this eBook we are going to explore particularly the nature of interactivity in the eBook giving example of how these might impact on teaching and learning - though all the affordances are linked.

1

The Nature of Interactivity

The Nature of Interactivity

When we are talking about interactive learning we are thinking about the nature of interactions between teachers, pupils and teaching resources. Teaching is a series of interactions between the teachers and the pupils in their classes. This might take the following forms:

1. **Questioning:** A large part of the teacher's time in the classroom is a series of questioning interactions between teachers and pupils.

2. **Activities:** the teacher will set a series of tasks that the pupil needs to carry out in the lessons - this may include pupils working in pairs or groups.

3. **Marking and feedback:** the teacher will offer feedback on student's ideas and student's work.

The idea of interactive learning with technology is not new and has grown out of the use of technology and virtual communication as well as social media. If we consider generation Y (or the net generation - homozapians as Zeen (2006) calls them or as Prensky referred to them, 'digital natives' (2001)) then these are the generation who have grown up with digital devices and who are natural and keen users of these.

This generation of students is starting to challenge the traditional

What kinds of technology are you using in your classroom?
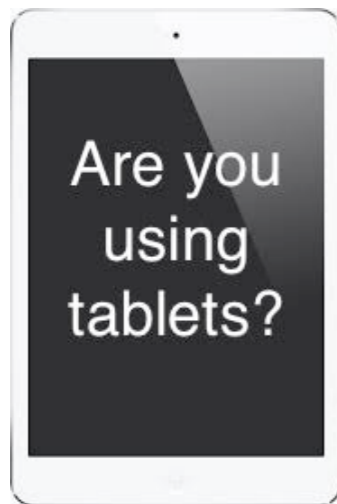
Are you using tablets in you schools if so please answer.

nature of the classroom. A classroom where we have a teacher working with 30 students for about 60 minutes and where the main artefacts of learning are pen, paper and paper textbook. These are students who are used to having access to a wide source of information, social networking and a degree of interactivity that was unfamiliar to previous learning generations.

Students are expecting a wider variety of digital learning resources that include not just simple instruction or information but opportunities for the expansion of knowledge and for the creation of learning artefacts by the students

and the opportunities for real-time and asynchronous collaboration. The roles between teacher and students are becoming blurred and have less meaning when we are talking about interactive learning.

Whilst technology has had little impact on the nature of teaching over the last 30 years what has changed are the resources that are used. It is hard to imagine a classroom that would not use video at some point in a teaching scheme and most teachers would find it impossible to teach without access to YouTube - which only came into being 10 years ago in 2005. What has changed little are the text books that are used are still produced

Figure 1 Hierarchy of Levels of Interactivity

Level of interactivity	Teaching strategy	Nature of interactivity
0	Teacher giving information	Internal mental activity on the information
1	Teacher asking questions	Some between teacher and questioner
2	Probing questioning	More reflection on information still one to teacher
3	Focussing dialogue	Some deeper interactivity and analysis on task
4	Group reflection	All involved - opportunity for evaluative thinking

mostly externally, often linked to schemes of work or examination syallabi, and a big investment for a school as they are expensive. There is no real opportunity for teachers within the school to be producers of these books and no real opportunity for books to be produced which have particular relevance to the pupils and teachers of a particular school - tailored to the learning needs of these teachers.

Many teaching systems around the world suggest that interactivity is an important part of the teaching and learning strategies which contribute to successful teaching and interactivity can be characterised as when students contributions are expected, encouraged and extended - indicating also the importance of feedback on students contributions. This implies that students engaged in interactive learning will have a higher degree of autonomy and independence that the more traditional didactic teaching model. This in itself then demands a different kind of resource.

This interactivity is traditionally see as something that the teacher (or other adult) initiates in the classroom it is supposed that teachers will be involved in the kind of activities outlined above questioning, probing, stimulating, encouraging, guiding, scaffolding etc …

Figure 2

S1	Engaging pupils	The range of stimulus materials available for the eBook include video, animation, audio, slideshows, high quality colour images.
S2	Pupil Practice and involvement	eBooks allow for the inclusion of a range of activities using widgets or on-line linked materials as well as the opportunity to use the affordances of the mobile device to input data - in textual, image, graphic, audio and video format.
S3	Broad Pupil Participation	The use of quizzes, tests and other assessment tools built into the book allow for the assessment of knowledge as well as the survey tools which allow for whole class participation.
S4	Collaborative forms	Collaborative work and widgets built into the eBook encourage both synchronous and asynchronous activities. The integration of social media also extends and develops this.
S5	Conveying Knowledge	The use of the non-textual formats allow for the conveying of new knowledge in a non-didactic method as well as tools which allow the co-construction of knowledge. Integration of apps / widgets which bring information into the book in real time offer rich knowledge building opportunities.
D1	Assessing & extending knowledge	The use of quizzes, tests and other assessment tools built into the book allow for the assessment of knowledge with the core advantage of quick and immediate feedback. Also the opportunity to send information to the teacher (or to others) for more rapid feedback.
D2	Reciprocity and Meaning making	Interaction tools that can be built into the book allowing a collaboration and iterative learning cycles to take place. Also the tools for the creation of authentic and relevant meaning and the opportunity for feedback on these artefacts.
D3	Attention to thinking and learning skills	The opportunities to use and manipulate data within the book allow the development of these skills.
D4	Attention to pupils social and emotional needs	eBooks can be personalisable and more easily tailored to the needs of the individual whether these be physical needs (text size and colour, auto-reading of text, but also easily tailored to the educational needs of the individual)

We can think of a hierarchy of levels of interactivity in class teaching (Figure 1).

We could think of these, as Hargreaves et al do (2003) as having surface forms or deeper forms of interactivity - they define the surface forms, which are those which have the purpose of engaging students, making things practical and active involvement as:

- **Engaging pupils:** Offering interesting and stimulating materials (S1)
- **Pupil Practice and involvement:** Hands on activity requiring movement and practical engagement (S2)
- **Broad Pupil Participation:** Strategies involving the whole class in activity or those that allow the teacher to assess pupil's knowledge (S3)

- **Collaborative forms:** constructs relating to pupil-pupil collaboration as part of their learning (S4)
- **Conveying Knowledge:** Assessing and extending pupil's knowledge and conveying new knowledge (S5)

and the deep forms, which have the purpose of extending knowledge, reciprocity and making meaning as:

- **Assessing and extending knowledge:** Opportunities to assess the knowledge of pupils (D1)
- **Reciprocity and making meaning:** Two way communication where pupil-teacher and pupil-teacher interaction is encouraged - encourages dialogue rather than didactic (D2)
- **Attention to thinking and learning skills:** development of thinking of learning skills (D3)

- **Attention to pupils social and emotional needs:** References to teaching addressing the emotional needs and the social interests of pupils (D4)

Reflecting on the affordances sketched out in the introduction we can consider the opportunities that the book as a resource gives to pupils to engage in these surface or deeper interactivity.

The traditional book could be seen as the resource equivalent of the didactic information giving or lecture (teaching talking) - there is no opportunity for the receiver to interact with the text or to question the writer. Whilst the traditional book may suggest activities and may offer some questions to be answered there is no interactivity - any work

takes place outside of the book and then must be looked at by the teacher at a later date - lacking both interactivity and immediacy.

The digital print book has some advantages over the printed text book - for example the opportunity to search the book (D1) and to make notes (S5) and to include resources such as dictionaries to help pupils with unknown words (S5). Well designed digital print books may include good text and images (S1) but these are likely to be very limited.

Well designed and developed the eBook can offer a much wider range of support for interactive learning we can consider each of the aspects of Hargreaves list and see how the eBook can support these - examples of some of these sorts of activities will be explored later in this book. This is especially true when the eBook also utilises some of the wider affordances of the mobile device that it is being read upon and the network opportunities if the device is connected.

The organisation of interactive learning in the classroom can be very difficult as the move away from instructing the whole class to move individualist working. Allied to this is the difficulty of offering differing tasks to the students and the need for individualised instruction. Using the tools available for creation of instructional video - such as Explain Everything, screencasting software, audio recording on presentations,

Voicethread or video editing tools such as Ed Puzzle. It is possible to move the instructional form to a much more individualistic and deeper form within the eBook - and the easy editing and adaptation of the eBook with new versions being easily 'pushed' to students makes adaptation and development possible.

After Burns and Myhill (2004) suggest that the interactive lesson should have some key factors:

• reciprocal opportunities for talk which allow the development of independent voices
• appropriate guidance and modelling when the teacher orchestrates the language and skills for thinking collectively
• Environments which are conducive to student participation
• An increase in the level of student autonomy.

It is not the the production of the eBook offers these outside of the pedagogical thinking of the teacher but they do offer, as we can see from the table above, more opportunities that the digital print or the print book

References

- this can encourage a move from technological interactivity to what Smith et al (2005) calls pedagogical interactivity.

Teachers use of technology such as the interactive whiteboard, or the presentation package has often decreased the level of interactivity in the classroom - with an emphasis on presentation, direct instruction and control (Somekh & Davies 1991;

Wegerif & Dawes 2004) the use of the digital eBook encourages many of the elements suggested by Burns and Myhill but especially those of autonomy.

So we can see that the eBook has the potential to support interactive teaching in a way that traditional books do not - we will see in the next chapter how using Bloom taxonomically gives us a way of thinking about the elements of interactivity associated with the eBook and with tablet / mobile technologies and which supports this move towards more interactive teaching and learning.
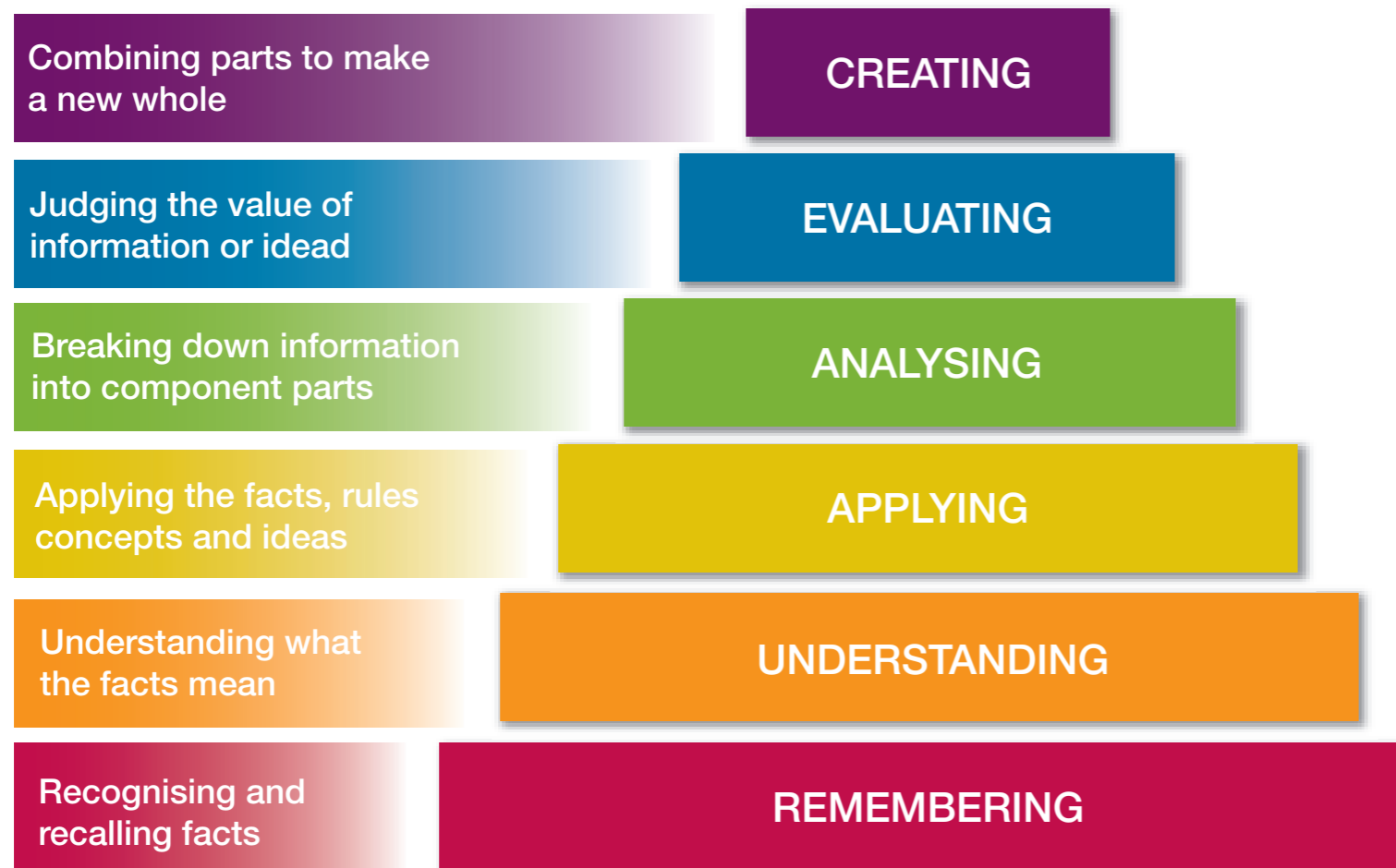
2

What Applications Are There And How Can They Be Used?

Bloom's Taxonomy

Figure 1 Krathwohl and Anderson's

Combining parts to make a new whole	**CREATING**
Judging the value of information or idead	**EVALUATING**
Breaking down information into component parts	**ANALYSING**
Applying the facts, rules concepts and ideas	**APPLYING**
Understanding what the facts mean	**UNDERSTANDING**
Recognising and recalling facts	**REMEMBERING**

In 1956 Benjamin Bloom led a group of educational psychologists developed a taxonomy or classification of levels of intellectual behaviour which they felt was important in learning (Bloom, 1956). They developed this taxonomy in three domains: the cognitive, the affective and the psychomotor. In looking at the place of applications and mobile learning we are looking at the cognitive domain for the purposes of the classification of learning apps or widgets.

The original taxonomy was later slightly modified by a group led by two of Bloom's students Krathwohl and Anderson in 2001 to make the taxonomy more relevant. The main change was the addition to the top level of the domain of the creation taxonomy (see figure 1).

Figure 2 Factual, Conceptual, Procedural and Metacognitive Knowledge

	Definition	Examples
Factual Knowledge	This is the core or basic elements of knowledge that students must know in order to have some acquaintance with a discipline and in order to be able to start to solve problems in it.	Core technical vocabulary (e.g. parts of speech, types of phoneme), historical dates and events, musical notation, chemical symbols etc ...
Conceptual Knowledge	This is the interrelationship among the basic elements within a larger structure that enables them to function together and understanding those interrelationships.	Chemical reactions, models of genetics, parsing sentences, laws of motion, models of government, rules of geometry, historical movements, child development.
Procedural Knowledge	Understanding the wider procedures and stages in order to complete a task - this includes the skills, algorithms, techniques and methods.	Skills of identifying and choosing, determining the right tool to use, how to blend techniques to create a picture, composing in multi voices or instruments, solving mathematical problems, choosing the best method for an analysis, undertaking a scientific investigation, writing a narrative.
Metacognitive Knowledge	Knowledge of the wider systems, self-awareness and knowledge of one's own cognition. Self-awareness and self-evaluation.	Knowledge of and understanding of systems. Ability to paraphrase and precis, research and synthesizing a variety of arguments, developing an argument for both sides of an opinion, self-evaluation of a process, improvement and becoming expert.

The cognitive domain can be divided into four areas: factual knowledge, conceptual knowledge, procedural knowledge and metacognitive knowledge. All of these are important in the development of the cognitive domain and the development of the individual child.

It is important to note that there is not a hierarchy here but that each of the domains develop and build on the previous domains it is not that creating is better than knowing or remembering but that it is difficult for creating to happen without some mastery of the previous stages of the taxonomy.

Figure 3 Bloom's Taxonomx Translated into Activities

KNOWLEDGE DIMENSION		COGNITIVE PROCESS DIMENSION					
		Remember	Understand	Apply	Analyze	Evaluate	Create
Factual Knowledge	Terminology Elements & Components	Label map List names	Interpret paragraph Summarize book	Use math algorithm	Categorize words	Critique article	Create short story
Conceptual Knowledge	Categories Principles Theories	Define levels of cognitive taxonomy	Describe taxonomy in own words	Write objectives using taxonomy	Differentiate levels of cognitive taxonomy	Critique written objectives	Create new classification system
Procedural Knowledge	Specific Skills & Techniques Criteria for Use	List steps in problem solving	Paraphrase problem solving process in own words	Use problem solving process for assigned task	Compare convergent and divergent techniques	Critique appropriateness of techniques used in case analysis	Develop original approach to problem solving
Meta-Cognitive Knowledge	General Knowledge Self Knowledge	List elements of personal learning style	Describe implications of learning style	Develop study skills appropriate to learning style	Compare elements of dimensions in learning style	Critique appropriateness of particular learning style theory to own learning	Create an original learning style theory

An example of how these can translate into activities can be seen in the table below (figure 3).

In this eBook we are looking how a range of applications can support these cognitive domains. Chapter 3 will explore the various applications and mobile technologies that fit within the framework. First we will explore some of the key ideas for each of these areas.

- iAnnotate
- Twitter
- Maptini
- Course Notes
- Quiznotes
- Blogger
- Google Search
- FaceBook
- Popplet
- Plickers
- Quizdom
- Word
- Pages
- The Camera
- Nearpod
- YouTube
- Vimeo
- Explain Eveerthing

1. Remembering / Understanding

Acquiring a core knowledge is central to learning be this from the letters of the alphabet to the numbers or number bonds. Understanding is then the process of constructing meaning from instructional messages, including oral, written, and graphic communication.

These has to come before other processes. There has been a lot of work on the importance of memory starting with Ebbinghaus and the forgetting curve and continuing with the work of cognitive neuroscience. The movement of knowledge from working memory to long term memory has been studied more recently and the work of Daniel Willingham is important in this area.

Key action verbs associated with this domain:

- recognise, describe, name, summarise, retrieve, paraphrase, compare, locate, match, interpret, expand, compare, locate, match, interpret, expand, report, exemplify, list, find, identify

Key learning activities associated with this domain:

- Highlighting, bookmarking, bullet pointing, commenting, word processing, social networking, blogging, searching, recalling, testing

Understanding what the facts mean

UNDERSTANDING

Recognising and recalling facts

REMEMBERING

2.   Applying

Applications that can support these activities.

- [Keynote](#)
- [Powerpoint](#)
- [Geometry pad](#)
- [Pic Collage](#),
- [Skitch](#)
- [iMovie](#)
- [Show Me](#)
- [Explain Everything](#)
- [UStream](#)
- [Sonic Pics](#)
- [Audio Boo](#)
- [Adobe Connect](#)
- [Evernote](#)
- [Comic Life](#)
- [Crossword](#)

So, we are looking for apps that fit into the remembering stage improve the child's ability to define terms, identify factoids and recall and locate information.

Apps that fit into the understanding stage provide opportunities for students to explain ideas of concepts.

Once there is a core of knowledge and understanding then this information can be processed and used to carry out a variety of actions, or to carry out or use a procedure in a given situation.

Key action verbs associated with this domain:

- edit, implement, share, stimulate, carry out, playm teach, execute, interview, draw, operate, construct

Key learning activities associated with this domain:

- edit, play, making movies, demonstrating, presenting, interviewing, mapping, simulating, collecting, photographing, blogging, diary making, puzzle-making

Applying the facts, rules concepts and ideas

APPLYING

3.   Analysing

Applications that can support these activities.

- [Skitch](#)
- [Voice Thread](#)
- [Flipboard](#)
- [TED-Ed](#)
- [Numbers](#)
- [Poll Everywhere](#)
- [Excel](#)
- [Graph Calc](#)
- [Inspiration Maps](#)
- [Popplet](#)
- [Mindmash](#)
- [Dropbox](#)
- [iMashup](#)
- [iCard Sort](#)

Apps that fit into the applying stage provides opportunities for children to demonstrate their ability to implement learned procedures and methods.

This part of the taxonomy is the process where students break material into its constituent parts and determine how the parts relate to one another and to an overall structure or purpose.

Key action verbs associated with this domain:

- infer, survey, deduce, compare, deconstruct, examine, sequence, outline, differentiate, contrast, construct, determine

Key learning activities associated with this domain:

- editing and redrafting, plots, surveys, spreadsheet, charting, reviewing, judging, peer-critique, graphing, summarizing

Breaking down information into component parts

ANALYSING

4. Evaluating

Applications that can support these activities improve the child's ability to differentiate between relevant and irrelevant; determine relationships and recognise the organisation of content.

In this part of the taxonomy students are expected to make judgments based on criteria or standards - to reflect and evaluate their own learning and the learning of others.

Key action verbs associated with this domain:

- defend, rate, discuss, support, rank, debate, opinion, critique, judge, network, prioritise, moderate, verify, collaborate, assess

Key learning activities associated with this domain:

- critique, reporting, itemising, hypothesising, online-quizzing, debating, summarizing, judging, blogging, peer-editing,

Judging the value of information or idead

EVALUATING

5. Creating

recommending, opinion validating

Apps that fit into the evaluating stage improve the child's ability to judge materials or methods based on criteria set by themselves or others.

In this part of the taxonomy students would be expected to put elements together to form a coherent or functional whole; reorganise elements into a new pattern or structure and to create their own artefacts of learning that are different from existing or new (at least new to them).

Key action verbs associated with this domain:

- transform, change, imagine, compose, assemble, rearrange, originate, invent, produce, create, publish. make

Key learning activities associated with this domain:

- video gaming, podcasts, video creating, digital stories, eBooks, songs, publishing, screencasting, blogging, wikis, websites,

Combining parts to make a new whole

CREATING

TASK

Consider the apps that you are already using. If there are in our lists then place them on the Bloom diagram - where about does your distribution lie? Are you using apps that support more of one part of the taxonomy?

What does this say about your use of apps? Just for "facts" or just for "creation"?

animations, movies, cartoons, apps

Apps that fit into the creating stage provide opportunities for children to

generate ideas, design ideas, design plans and produce products.
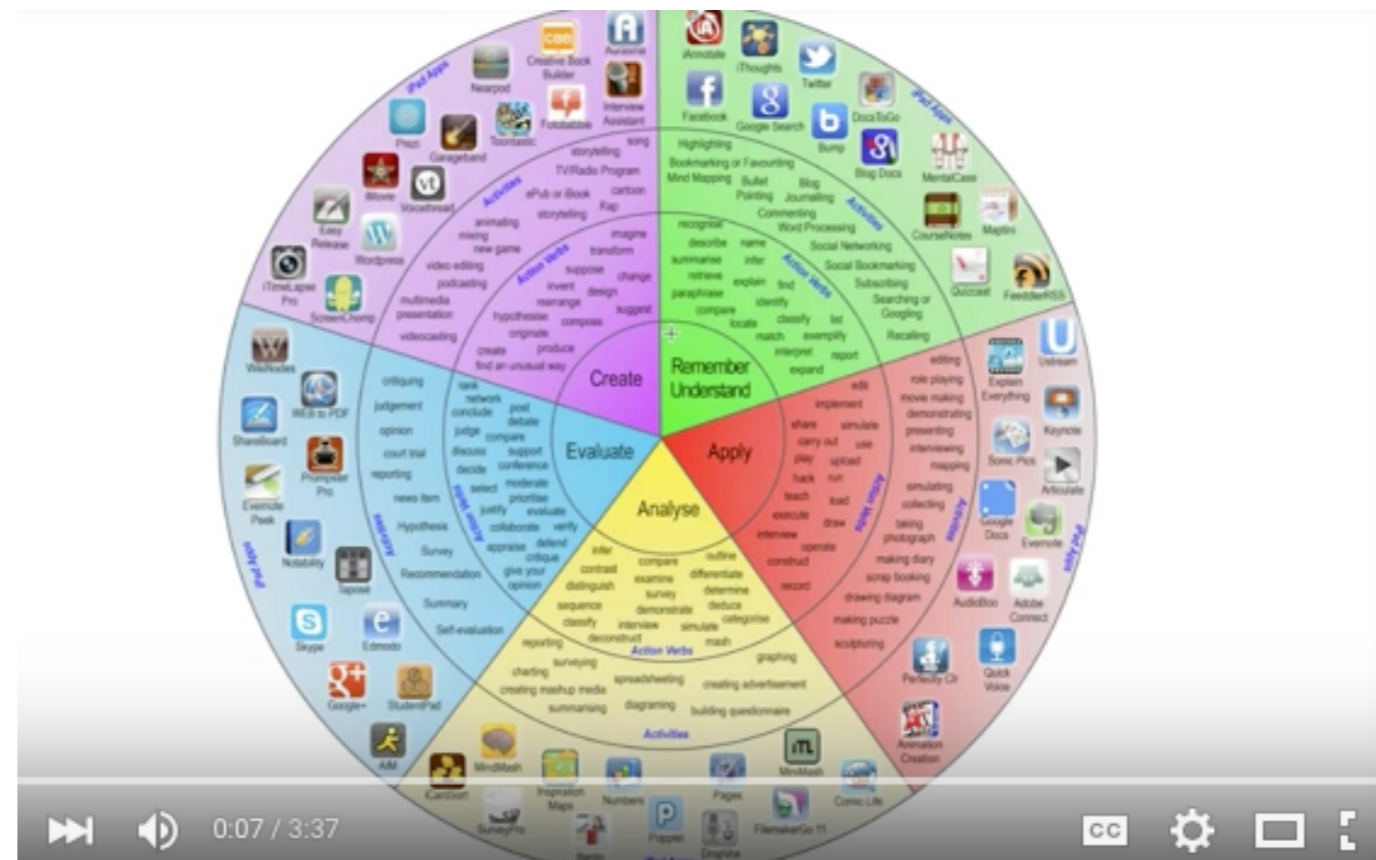
Bloom's Taxonomy for Apps (you need to be on-line)

3 Interactivity in Context

1 Introducing Widgets

What is a Widget?

Widgets are small applications, so called auxiliary programs, which are executed on the desktop. Both of the most common operating systems, Microsoft Windows and Apple OSX, make use of these little helpers and they are widely used and accepted. In the classical sense, a widget would be a calculator, a note pad, a calendar, a thermometer etc.

These widgets are usually coded in JavaScript and were integrated in OSX 10.4 (Tiger) in Apple's Dashboard.

As of today, there are several tools and applications ready and available on the market, e.g. iBooks Author, Adobe InDesign, Book Creator (iPad App). Depending on the amount of desired functions, these apps can be very pricey and complex in their use. A very nice alternative is iBooks Author, which

enables the author to create an eBook in a very simple way. These eBooks are directly made for the use on the iPad as a reader. The tool offers to create your own design templates to customize the eBook.

Typically, simple forms of media, like video and audio, can be integrated but not be used interactively. In order to implement, for example, a quiz, there is a simple tool to create repetitions. However, the widget cannot save input, which sets high limits on interactivity.

A large benefit of iBooks Author is the integration of HTML. This function allows the author to include both BookWidgets or other web based HTML5 content. The alternative content can, for example, be created with learningapps.org and then integrated. Learningapps.org is a

Learning Apps

Bookry Website

Book Wigdets

platform, in which a registered user can create small apps, which can be used in a teaching and learning scenario. Learningapps offers simple ways for sharing created apps in the form of links, QR-codes as well as the integration in iBooks Author projects. The apps can also be created by the learner themselves.

Besides the possibility to create your own app, there is a vast amount of learning scenarios available that can be used either directly, or as a meaning for inspiration.

Anyone who is able to code using either HTML5 or Java-Script, can create apps themselves and include them in eBook projects.

There are very good tutorials for the integration of HTML5 elements

available on Apple's support websites. HTML5 practically substitutes Adobe Flash elements, which could not be processed on OSX devices.

In the following sub-chapters, possibilities offered by BookWidgets will be evaluated. In short videos I will describe what needs to be kept in mind.

While we are concentrating in this publication on Book Widgets there are other providers of widgets the most notable of which are www.bookry.com. This editor offers quite simple ways to program small applications. It generates a .wdgt file that contains the most important information and data. This file can be compared with a power point file, which contains images as well as other types of media.

**Figure 1** Examples of BookWidgets

• Exit Slip	• Random Images
• Quiz	• Vimeo Player
• Worksheet	• Frame Sequence
• Split Worksheet	• Image Carousel
• Whiteboard	• Piano
• Split Whiteboard	• TipTiles
• Flash Cards	• Youtube Player
• Timeline	• Active Plot
• Bingo Card	• Chart
• Hangman	• Arithmetic
• Memory Game	• Spreadsheet
• Pair Matching	• Google Maps
• Word Search	• Web Embed
• Crossword	• PDF Viewer
• Jigsaw Puzzle	• Wikipedia Browser
• Mind Map	• Form/Survey
• Randomness	• Image Viewer
• Before/After	• Hotspot Image

The .wdgt file can be included in the interactive book by the user.

The Book Widgets and the editor can be run on several different operating systems. OSX and Windows are just as well supported as Android Tablets and ChromeBooks. The widgets created can also be viewed and executed in the editor.

Widgets in eBooks: Basics

Figure 2
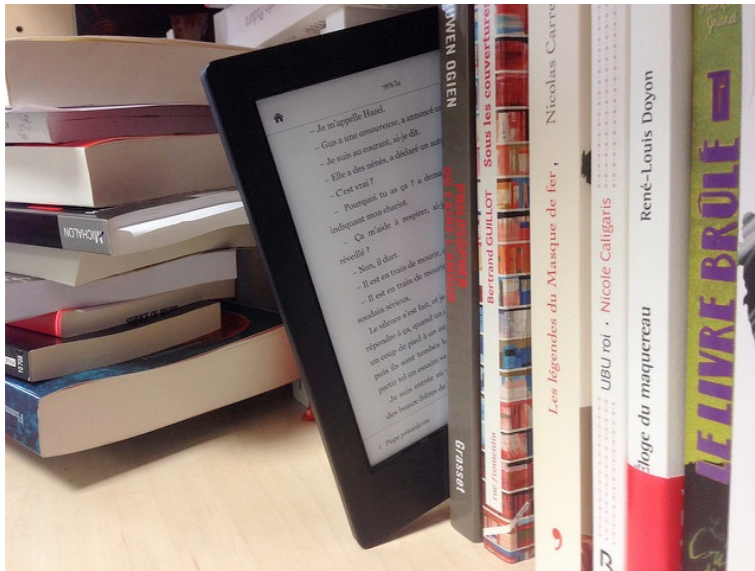
If this exemplary range of apps is not sufficient, the desired functions can be coded with editors. These editors generally handle the creation of the necessary HTML5 code.

Adobe Edge Animate, Tumult Hype und Sencha Animator are typical examples of these editors. Tumult Hype is relatively simple and allows direct export of the project as a widget file.

The following is a general tutorial on how to integrate widgets in an already existing eBook project.

The focus will be on widgets created with Bookwidgets. After creating an account, the user can create widgets online or choose to download an app for the computer. There are no differences in the functions, however,

when using the app, no constant Internet connection is necessary. After

choosing a desired widget, the author has to set the specific preferences. These preferences cannot be explained generally and are therefore described in the following chapters (see screencasts).

Changes in design are self-explanatory and will not be discussed.

Once the widget is created, it just needs to be saved. The application saves the file on the local hard drive, while the Internet application also offers to create a direct link to the widget that is saved in a cloud.

The generated files only need to be imported into iBooks Author, which is the same process like it is in word

processing applications. During the import, the path of the source has to be quoted to include the desired widget file.

https://creative.adobe.com/de/products/animate

http://tumult.com/hype/

http://tumult.com/hype/

2 Mindmap Widget

General Didactic Potential of the Mindmap Widget

Mindmap widgets are very good tools for facilitating and teaching self-regulated learning. The learner needs to be supported with the integration of information step by step. Mind maps are great tools to support structured learning processes. Instead of a merely quantitative increase of knowledge, mind maps offer a way to structure content in order to increase the quality of the output. The mind map widget can be applied at virtually any study level and in different phases in class. Learners can make use of the widget in different ways in their eBook:

- to structure and to go through content
- to organize their prior knowledge
- to gather ideas and to structure them
- to get an overview of the content

- to analyze and present their knowledge and their ideas

Besides working on presentation and design, the students need to develop a skill to find words in order to categorize their content. This is not only needed when working with the widget, but more of a basic mind map competence for the classroom.

However, using digital mindmaps introduces a great variety of new methodological competences for the students, especially when using mobile devices. The students are able to focus entirely on the content because the design can be changed afterwards.

Additionally, a great advantage is the fact that it is all coming together in one place. The task can be directly linked to
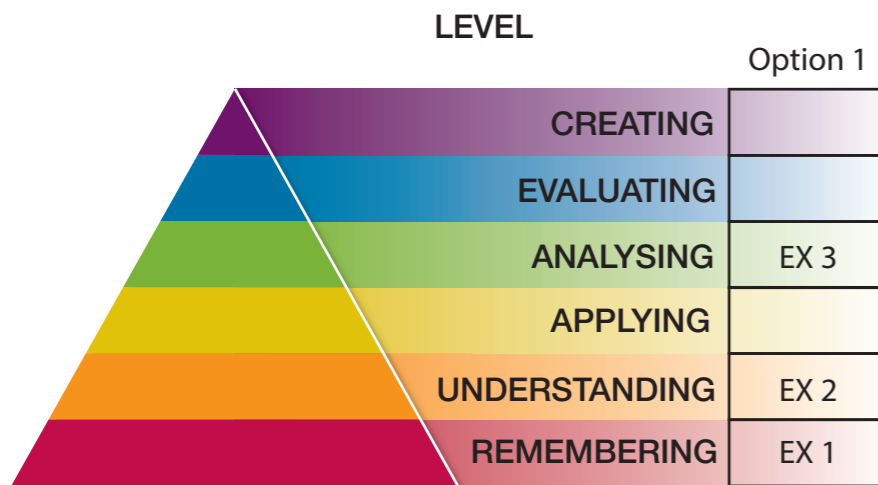
the mindmap and is in direct context of it. This way, Web 2.0 tools, like Mindmanager or Bubbl.Us, as well as the classic pen and paper, become unnecessary. It is then an easier process for the learners because they are not depending on a working Internet connection and do not need to worry about user names and passwords. Schools without a functioning Wifi environment will especially benefit from that. Through fixed integration into an eBook project, related and self-regulated tasks can be summed up under one or several topics. Epochal tasks typically build on

each other, are more complex and have a longer duration. If these tasks are presented in a simple way, with just a single info text that is accompanied by multimedia elements, the eBook project becomes more of a multi media worksheet. This concept is, of course, possible and relatively simple to realize with all kinds of widgets.

Since the widget is then stored within the eBook itself, similar to a picture or video clip, the widget does not allow collaborative forms of work. However, with a little bit of creativity and because of the fact that not every learner will have his/her own iPad, groups and partners can discuss the contents face-to-face and work on the mindmap together.

Furthermore, the results of the project can be stored permanently on the

Figure 1

LEVEL

	Option 1
CREATING	
EVALUATING	
ANALYSING	EX 3
APPLYING	
UNDERSTANDING	EX 2
REMEMBERING	EX 1

learners eBooks. Increase in knowledge can be documented, discussed and if necessary corrected at study conferences. Therefore, this instrument is very appropriate for individualized settings, but can also promote social learning.

Based on Bloom's taxonomy, the widget MindMap can be classified into different levels and can be used in different scenarios during an eBook project. It works as an introduction (e.g. in form of an overview over a topic), just as well as for repetitions, consolidations and summaries of a topic or certain content. Prior knowledge can be structured and reactivated. Newly gained knowledge can be presented in a structured way — and brought in connection with prior knowledge. Using pre-structured support, already existing fields of knowledge can be enlarged and new fields of knowledge can be created. In the foreign language classroom for example, the tool can be used to structure a prepared semantical field, like fruits or vegetables. This would be classified as the stage of

Remembering according to Bloom's taxonomy. Besides the thematic structuring, grammar topics, like prefixes,

suffixes or radicals are possible. If students are able to develop this on their own, it can be classified higher, as Analyzing.

In the following, it will be shown, how an example can be classified in Bloom's taxonomy.

If the task would be, to add information to an already known family structure of a fictional or real family from a movie or a text, the task would be classified as Remembering. (ex.1)

If it would be changed in a way, that the learners would have to create the structure themselves, based on a text they read, it would be a reproduction and therefore classified as Understanding (ex.2). A cluster, created by the learner on the basis of a non-fictional text would also be classified on this level.

If the learner has to create their own family tree with the use of the widget, they have to apply an analytical competence in order to find out about the components of a family. This transfer to their own familial situation increases the difficulty of the task. In addition to that, there are modern forms of families like blended families. In this case, the task would be classified as Analyzing (ex.3). The traditional set up of a family can be

How to Develop this Widget

Screencast 1 Development of a Mindmap Widget
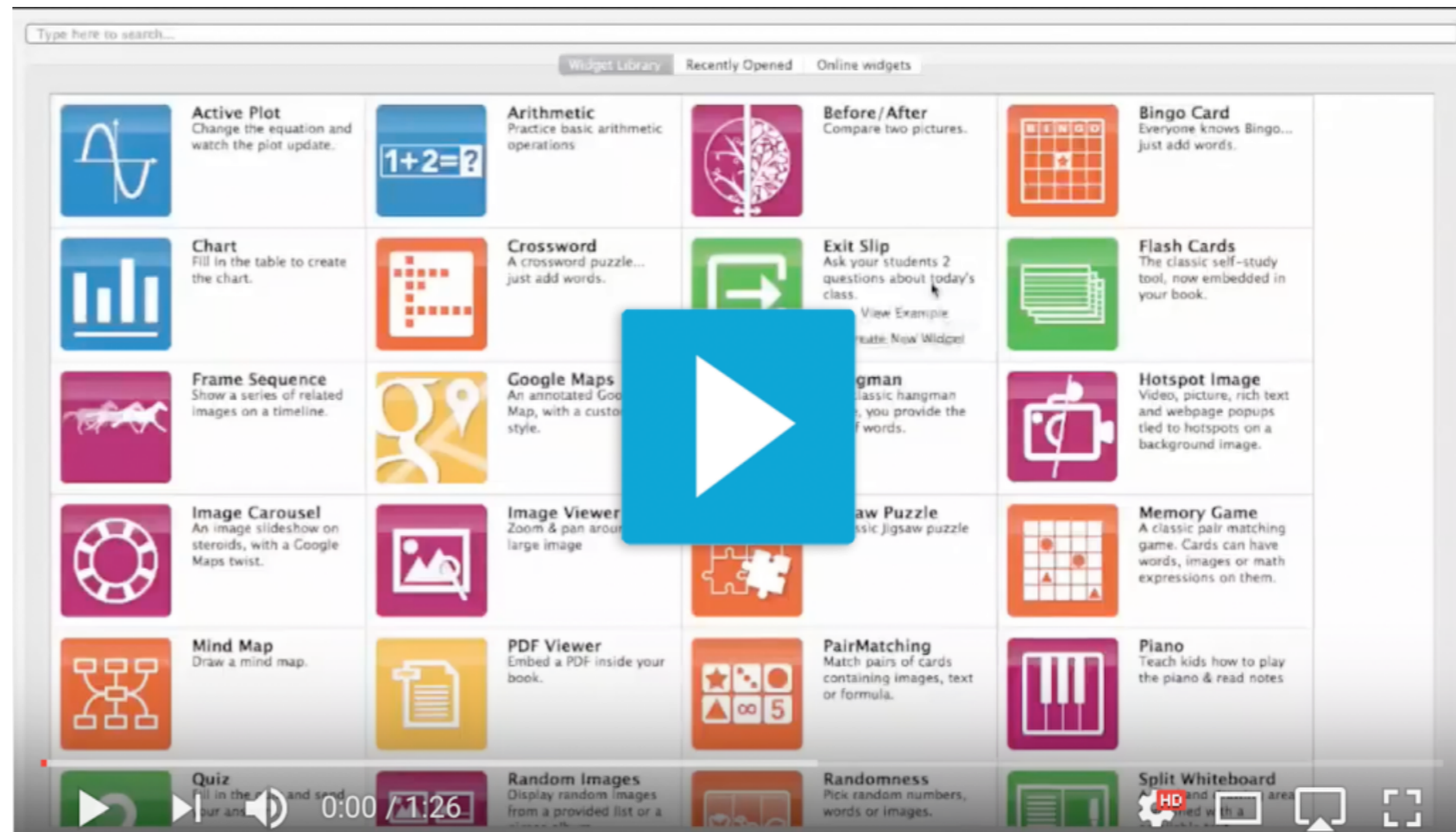
displayed in a mindmap with two
branches, one for the maternal and

Example

Boundaries for Using this Widget

one for the paternal side, that both have two branches for the generation of the grand parents. If there are siblings, the students have to add a branch on the top level. Blended families can be much more complex to display in a mind map. To introduce this topic in the classroom, the teacher could make use of a family tree of a popular family, like the Kennedys.

The task can also be adjusted thematically, for example, when creating it for royal dynasties and their many entanglements. This way, the learner can put small extracts of history into the bigger picture and can make sense of historic actions, like the renaming of the English royal dynasty of the house of Saxe-Coburg and Gotha to the house Windsor.

Suggestions for Further Development

Since the widget is integrated into the eBook file just like an image or a video file, it is not possible to change the mind map on different devices at the same time. This results in a change in the social form, as soon as the teacher asks for collaborative work on the mindmap. On the other hand, the learner can also draw on Web 2.0 applications like the cost free Bubbl.Us (https://bubbl.us) or the German fee-based Mindmeister.

The possibility to add pictures or image elements is a great way to make mind maps more attractive for both the learner and the author. This would result in the following scenarios: Pictures added by the author can trigger impulses to differentiate. They can also serve as structuring elements, to help the learner focus on the main task. As a result, the learner could then interconnect knowledge and structure it more easily. In the previously discussed example, this could be pictures of the members of his/her family that the learner could take with the device or use Cliparts as placeholders.

It would be a great improvement, if links and notes could be added in a text box. This way, the task or comments could be moved around freely on the Mindmap. Some of these features can already be found in various mind mapping applications.

Additionally, the usability can be worked on immensely. When considering inclusion, it is often necessary for visually impaired students to be able to zoom in to the content to be able to read it. This would also be a great feature for other learners, since it would be easier for them to keep an overview over large and complex mind maps.

While the color and shape of the content can be manipulated afterwards, the system does not allow the user to make changes in the type

3 Timeline Widget

General Didactic Potential of the Timeline Widget

The widget's main purpose is to help create timelines. Text based events are aligned on a timeline into a chronological order. In addition to timelines, flow charts, which need to be put in a chronological order, can also be created. At the moment only linear sequences are possible

Using the widget, historical and other chronological events can be presented and text can be provided with them. A possible task would then be to bring these events into a chronological order. This way, the timing of events can be visualized.

The author can decide how many starting events he/she will provide. This way, the tool can be used to differentiate between weaker and stronger learners. Weaker learners will already have more correctly placed

Figure 3 BookWidget example for a timeline

events/items on their timeline than others.

Additionally, processes and timed occurrences can be created, displayed and planned with the tool. An example for that would be technical developments, like the development of the automobile.

Obviously, the widget can be used to illustrate personal timelines and biographies. This can be used in the history classroom as well as in many other contexts. Certain attributes have to be entered by the learner in a designated window.

The widget enables the author to create and include information texts. Furthermore, it is possible to use another app, which can display websites in an eBook, to display the

original source. This way, the author can save time and does not have to worry about copyright issues.

However, if the educator simplifies or summarizes a text, the content can already be reduced didactically and content can be selected. Weaker learners would benefit from this.

The learner has to extract the information from the text and type it into the individual event windows, thereby creating the timeline.

In addition for the timeline to be used in the history classroom, it can also be used in the (foreign) language classroom. Especially the storytelling method, where the learner adds to a story that is read/created chapter by chapter, can be realized with the Timeline widget. Every chapter and/or

A Possible Scenario in Comparison to the Conventional Method

passage can be entered into a new event window. This way, all students have the same frame for the story, but they can influence the stories chronology. The teacher/author could also include the story as audio files in the eBook, to give individualized access to the entire story. This would be another way to differentiate between stronger and weaker learners.

Compared to the conventional method of creating a timeline, the widget is easier to use and it is simpler to create an aesthetic result. This is especially great for learners without much prior knowledge, since they can focus on the content rather than the design of the timeline.

However, it needs to be kept in mind that the widget can only create linear sequences – parallels or ramifications cannot be displayed.

The advantage of the widget is, again, its close relation to the task in the eBook. No additional tools or applications are necessary, which makes it easier, especially when compared to Web 2.0 tools, that made an additional authentication and a permanent Internet connection necessary.

Figure 3

LEVEL

Option 1

CREATING	EX 2
EVALUATING	
ANALYSING	
APPLYING	
UNDERSTANDING	
REMEMBERING	EX 1
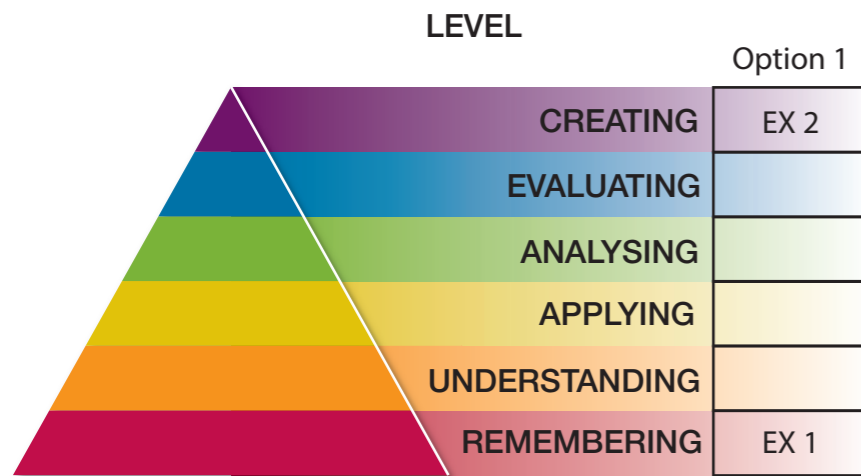
A Specific Example for the Use of BookWidget's Timeline Widget

It is relatively simple for the author to create a structure and to share it with the students within an eBook file. Thus, every learner will have his own, pre-made structure.

Using a Web 2.0 tool, the author has to create individual structures for every student or has to decide on a more collaborative form of working. On the other hand, the simple preparation for the eBook limits collaborative designs.

The example presented here, where students are asked to put the events of the Falklands Crisis into a chronological order, can be classified as Remembering according to Bloom's taxonomy (ex. 1). The learners can obtain the necessary information from the Wikipedia site of the Falklands War (https://en.wikipedia.org/wiki/Falklands_War).

The rather complex text can be didactically prepared, reduced and simplified, by the author in order cater it to the students' level. This also reduces the risk of misinterpreting or misreading the information presented.

The example can also be prepared by the educator in form of a chaos timeline. This means, the author provides all the important events, but

Example

the students have to sort them by drag&drop.

If it is desired to reach the highest level in Bloom's taxonomy, a possible task would be to ask the students to complete the previously created events. This involvement with the content will lead to high study results.

There are, of course, many more examples that can be classified in various levels in Bloom's taxonomy.

Storytelling (ex. 2) for example, can be classified on this level, when used to complete a picture story. Because of the creative involvement with speech production and content, this type of exercise would be classified under the top category -Creating- in the taxonomy. Normally, a typical picture story task would be to draw or take

further pictures to continue the story. However, using the widget, it is only possible to continue the story in writing.

Similar to the mindmap application, the timeline can be used to display events in literature class. It would be conceivable to present the storyline of James Joyce's Ulysses in a timeline. The learner could then create a reading diary and could then write chapter summaries into the event windows. This way, every situation on Leopold Bloom's journey through the Dublin of June 16th, 1904 can be logged and presented.

The Timeline widget might also be used in a scientific classroom context. For example it can be used to design, plan and create an experimental setup,

How to Develop this Widget

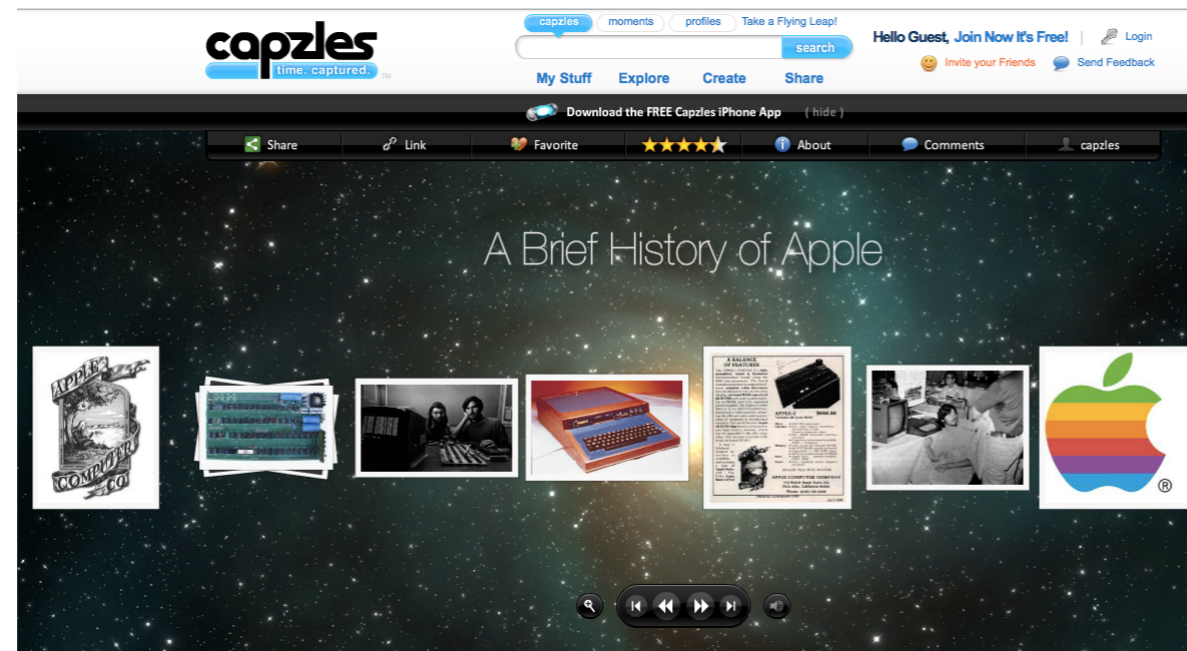**Screencast 2** Development of a Timeline Widget
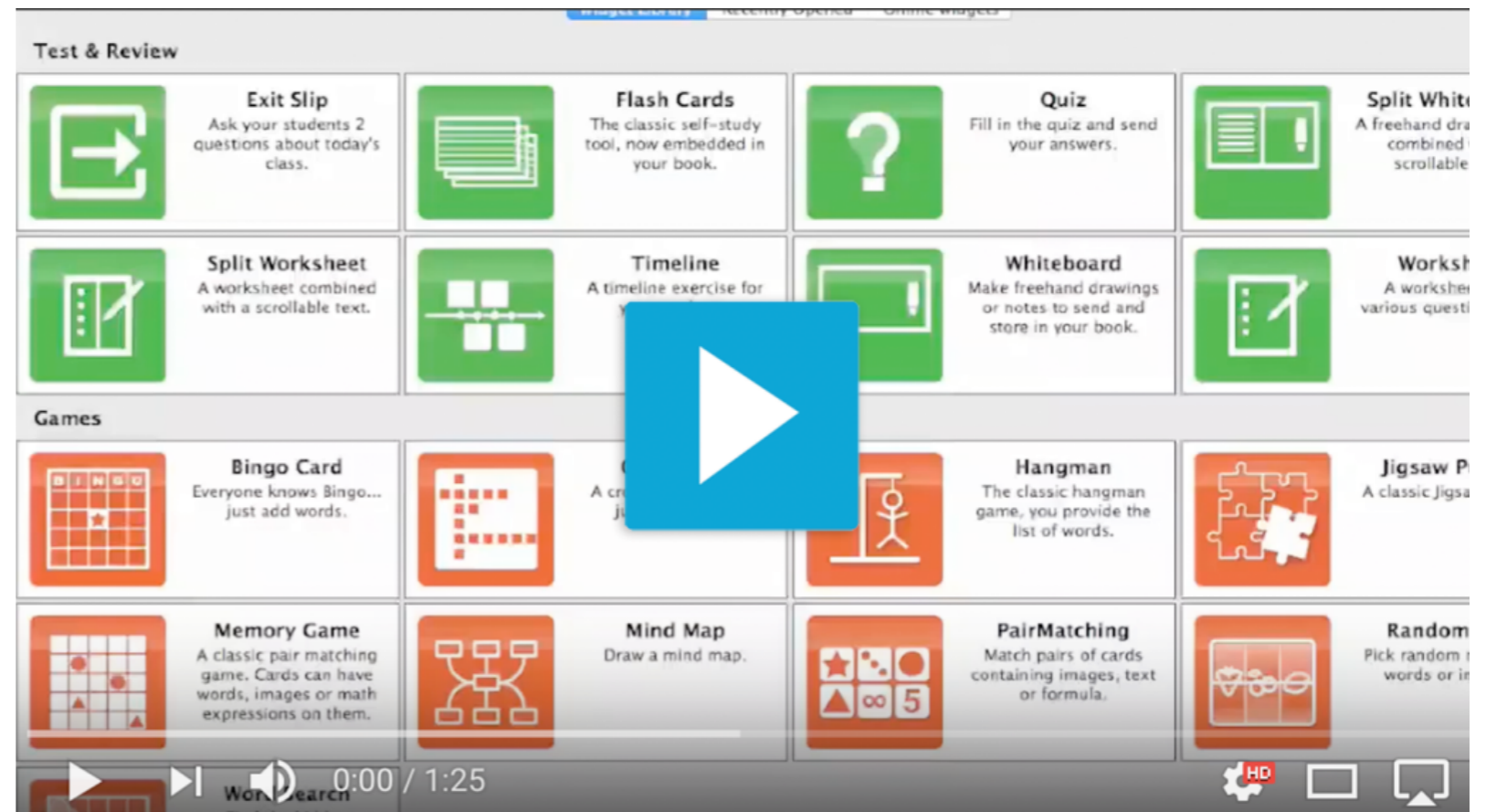
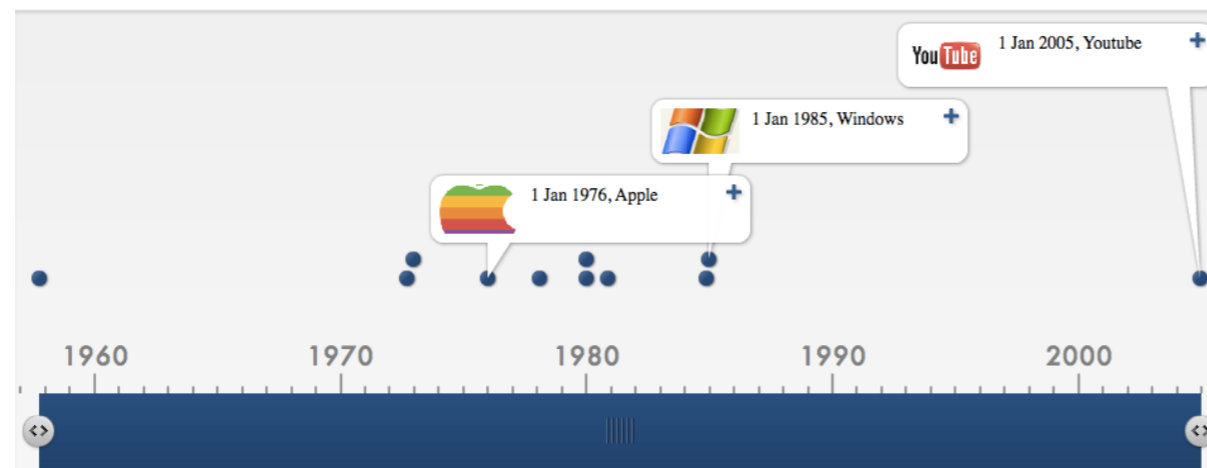which would then be carried out by the students. As an introduction, it would be a good idea to show the students a video of the experiment they are about to try out. The students can then fill in the information in the event window of the timeline.

Figure 4 Screenshots of Capzles Website

Suggestions for Further Improvement

Collaborative work is not possible when this widget is integrated into an eBook. However, it would be possible for learners to work together using one device. Collaborative work would be possible when using Web 2.0 tools. If this is desired, a possible web service would be Wallwisher, which would also give the user greater independence in terms of the design of the chronology. The individual notes and events can be created and changed around afterwards. The collaborative functions would give one of the learners the chance to be the designer of the timeline, since all participants can switch up the notes at any time.

4 Chart Widget

General Didactic Potential of the Chart Widget

The widget's main purpose is to integrate diagrams into an eBook, that can be prepared by the author and then filled with specific number content by the learner. Different from spreadsheet software, the widget directly creates a column diagram based on the data provided.

The fixed chart structure is especially suitable for unexperienced learners. Additionally, it offers a simplified way to create diagrams, because the functions are reduced. The widget can be applied to various different levels and tasks. The following examples are possible:

- Reproduction tasks
- Tasks that incorporate mathematical operations
- Tasks that put numbers in a specific context

A Possible Scenario in Comparison to the Conventional Method

- Tasks that analyze and interpret numbers
- Tasks that link information and numbers in a meaningful way

The biggest advantage of the Chart widget is the integration of a chart into an eBook-project, where the task, as well as the results, can be displayed in the same context. No complex spreadsheet application is necessary. The functions are very straight forward and easy to understand for the learner, and the author can prepare and define the task very precisely.

The chart does not change from the way it is prepared by the educator. This way, the selection of possible functions is very limited and it is very easy to use for young learners.

Compared to an existing Excel spreadsheet, the learner does not get so overwhelmed by the large amounts of content, that might distract her/him from the actual task. In order to do collaborative work, DIY Chart builders are available. After registration, different types of diagrams can be created, based on the numbers provided. However, it is a disadvantage that every user needs her/his own account. When there are a great number of students, the teacher has to prepare all the accounts in advance and has to prepare the basic date for every individual account in order to generate individual links for the

eBooks, or he has to create one spreadsheet for all learners.

The learner is able to focus on the content, since the widget can be integrated into the eBook directly and there are no possibilities to change the design.

It is also very feasible to make use of available Web 2.0 tools, especially when the small number of functions of the widget is not enough, or if heuristic strategies to develop algorithms are to be applied. One possible option would be the use of the speadsheet function in Google Drive. However, just like with any other Web2.0 tool, it is very strenuous for the educator to create individual charts for every learner. This

A Specific Example for the Use of BookWidget's Chart Widget

Figure 5

Widget 3 Chart
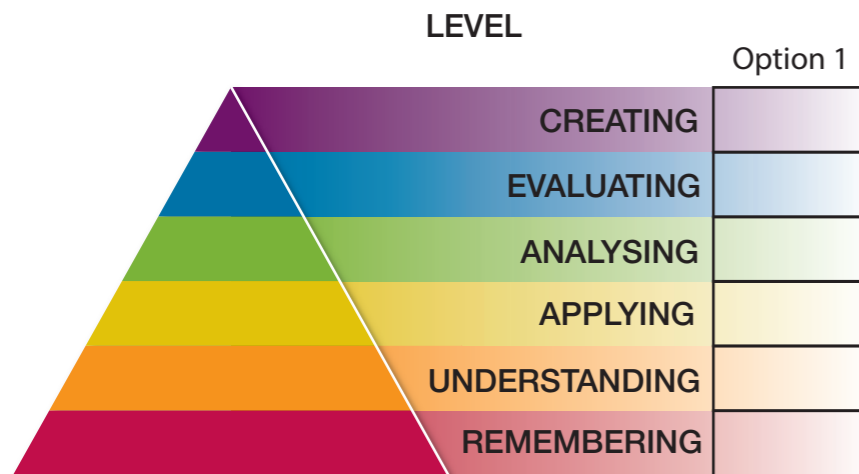
would be much depended on the initiative of the learners themselves.

The example presented here is comprised of an informational text that describes the sales numbers of eBooks over the course of the past few years. The learner is asked to fill out the chart with all sales figures that are specifically named or can be figured out on basis of the text. The widget Chart would hereby be classified under the Analyze level of Bloom's taxonomy. It would also be possible to reach the level of Evaluation, for example, if the learners had to extract the results of a survey and then use the created chart as a basis for an interpretation.
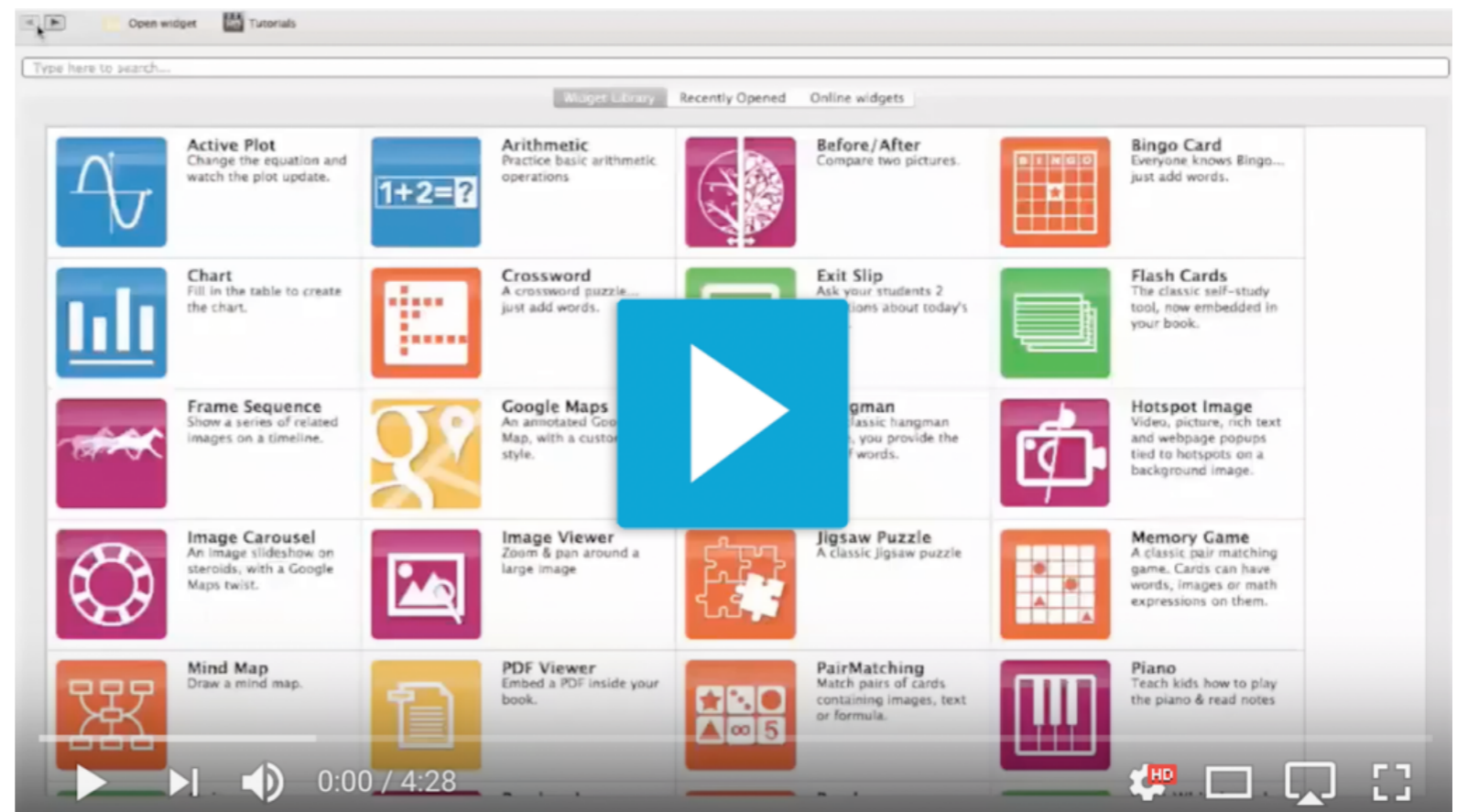
In a more concrete way, this could mean that the students would conduct a survey about the use of media and use the widget to display their findings and to come up with reasons for the numbers. The last part of this task

How to Develop this Widget

Screencast 3 Development of a chart widget

could not be realized with the Chart widget but with another widget by Bookwidgets, Worksheet. The presented tasks show how widgets, not unlike more conventional methods, have to be seen in a greater context and cannot be seen separately.

Limits to the Use of the Chart Widget

The Chart widget only offers 2D column diagrams, which is a limitation for presenting certain type of data and to compare types of diagrams.

Additionally, it is problematic for the user to change the entered data once it has been put in the chart. Depending on the type of task, this might be a desired feature. Furthermore, it is not yet possible to add a row or column to the chart after it was initially created.

In order to offer the option to self-correct, the author could provide a pre-made graphic in the eBook, with which the student could then use to prepare her/his results. The widget covers the eBook and the source information, and this makes it hard to correct and put in the data.

Suggestions for Further Improvement

In addition to that, feedback cannot be tracked. The author can only decide to have the results saved in the eBook, but cannot share corrections.

It would be a useful improvement to add more types of diagrams, so that students can learn about why some diagrams make more sense than others depending on the data and what needs to be presented. Especially circle and curve graphs would be a great addition.

Furthermore, a feedback function for the student would be very nice, not only for this particular widget. The student could send feedback directly to the educator/author and she/he could give differentiated feedback. This is especially important, since school book publishers are pushing in on the eBook

market. Learners would have a simple way of logging their studies.

Another very good addition would be a split screen view, that would allow the learner to view both the information and the chart at the same time.

5 Whiteboard Widget

Description of the Whiteboard Widget

The Whiteboard widget is a simple whiteboard tool. Generally, interactive whiteboards are quite popular and come usually with board-specific software. Since the widget only offers a few of the usual whiteboard features, it cannot be compared to actual whiteboards.

In addition to typical entry phases, problem oriented work phases and phases where the results are reviewed and presentations, the widget only offers a few other possible scenarios:

• brainstorming exercises
• creative exercises
• fill-in-the-gap tasks
• marking and drawing tasks

Reviewing the possible social forms the tool offers, both individual and group work is possible. However, it is only under certain circumstances possible to use the tool for teacher demonstrations. Real time synchronization is not available, if connected to a visualizer, it can be used just like a normal interactive whiteboard.

The whiteboard widget can be used in many different subjects, depending on the skills, tasks, and competences that need to be taught.

A Possible Scenario in Comparison to the Conventional Method

Since other tablets and iPads are gaining in popularity, learners can already practice the use of a whiteboard in a decentralized way. Based on this fact, the application of whiteboards in the classroom is bound to change, since students will know how to better work with them before they ever use one themselves. If we consider that all students would have an iPad, there is not only one whiteboard per classroom available anymore. This makes partner and group work possible, in which the learners would not work on their own iPads but work together on pairs or larger groups with one tablet device.

Just like with other applications, the Whiteboard widgets offer a drawing option with nine colors and three brushes that differ in thickness. Text can be entered in text fields. However, wrong input cannot be corrected, therefore spelling mistakes need to be avoided or tolerated, depending on the exercise. Text can only be deleted as a whole, using either the undo or the eraser tool. A once deleted text field can be recovered using the redo button. The author can also give access to a scientific calculator, as well as to the devices photo library. A variation of the widget is the Split-Whiteboard, which offers a vertically split screen with the whiteboard on one side and the possibility to display a text on the other side.

Completed text fields cannot be moved. Instead, the fields stay located where they are created.

Figure 6 Example of the Feedback Feature

The widget can be used in all brain storming or clustering activities.

The learners can label a graphic either with text fields or the brush. Both inputs can only be deleted as a whole with the use of the eraser tool. Entering data without a pen (stylus) is not easy on the iPad. Delicate labels with the brush are not possible. Writing with the finger is more like drawing and just like with traditional interactive whiteboards, the learner needs some time to practice before the results are adequate.

The author can include a very nice feedback feature into this widget. Once the task is finished, the learner can fill out a contact form where the email address of the educator can be included. This way, the educator can receive all results created by the students. This very comfortable feature should be included in other widgets as well and would be especially advisable for published eBooks: Publishing houses would not have to worry about the feedback and both the learner, as well as the educator, would be involved in the organization.

A Specific Example for the Use of the Whiteboard Widget

Figure 6
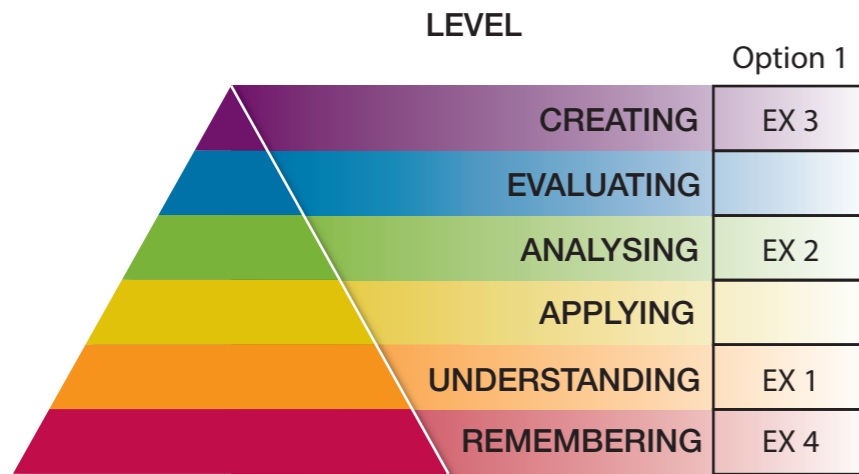
In addition to the classical applications for interactive whiteboards, the widget can be used in an eBook project where the learner has to fill out, label, or finish the drawing of something. For example, if an image needs to be coloured or a collection of words has to be completed. Words from the same semantic field can be transformed into a graphic text field with pictures and drawings. This type of exercise would be classified on level 1, Understanding, on Bloom's taxonomy (ex.1).

In the foreign language classroom, this can be applied when using a vectorized background graphic of the size 1024x680 or 1024x724 that needs to be labeled by the students. The example presented here can be used in the EFL classroom for the semantic field 'parts of your face'.

It is possible to apply the task 'label something' to virtually any subject.

In the biology classroom, graphics of the heart, or other anatomical structures can be labeled. This would also be classified as Understanding (ex. 1).

Additionally, the Widget can be transformed and used as a colouring or drawing application and would then be suitable for younger learners. In order to do so, the educator would use a vectorized black and white background graphic and the students can use the brush to colorize the picture in a pre-

organized or free way. The very popular 'painting by numbers' can be created by the teacher and used in the classroom.

In the Physics classroom, especially when dealing with mechanics, forces can be drawn on a background picture. This can also be combined with physical education. Here, the teacher can focus on physical activity and have the students draw force vectors. This task would be classified under Analyzing in Bloom's taxonomy.

Alternatively, the magnetic field lines of different types of magnets could be drawn in the picture. This can be used as a test or as simple practice task.

In order to reach the highest level in Bloom's taxonomy, another aspect from physical education can be
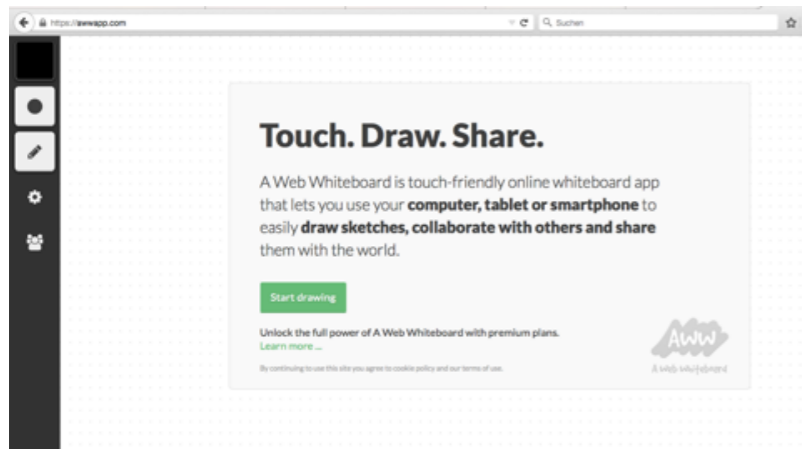
How to Develop this Widget
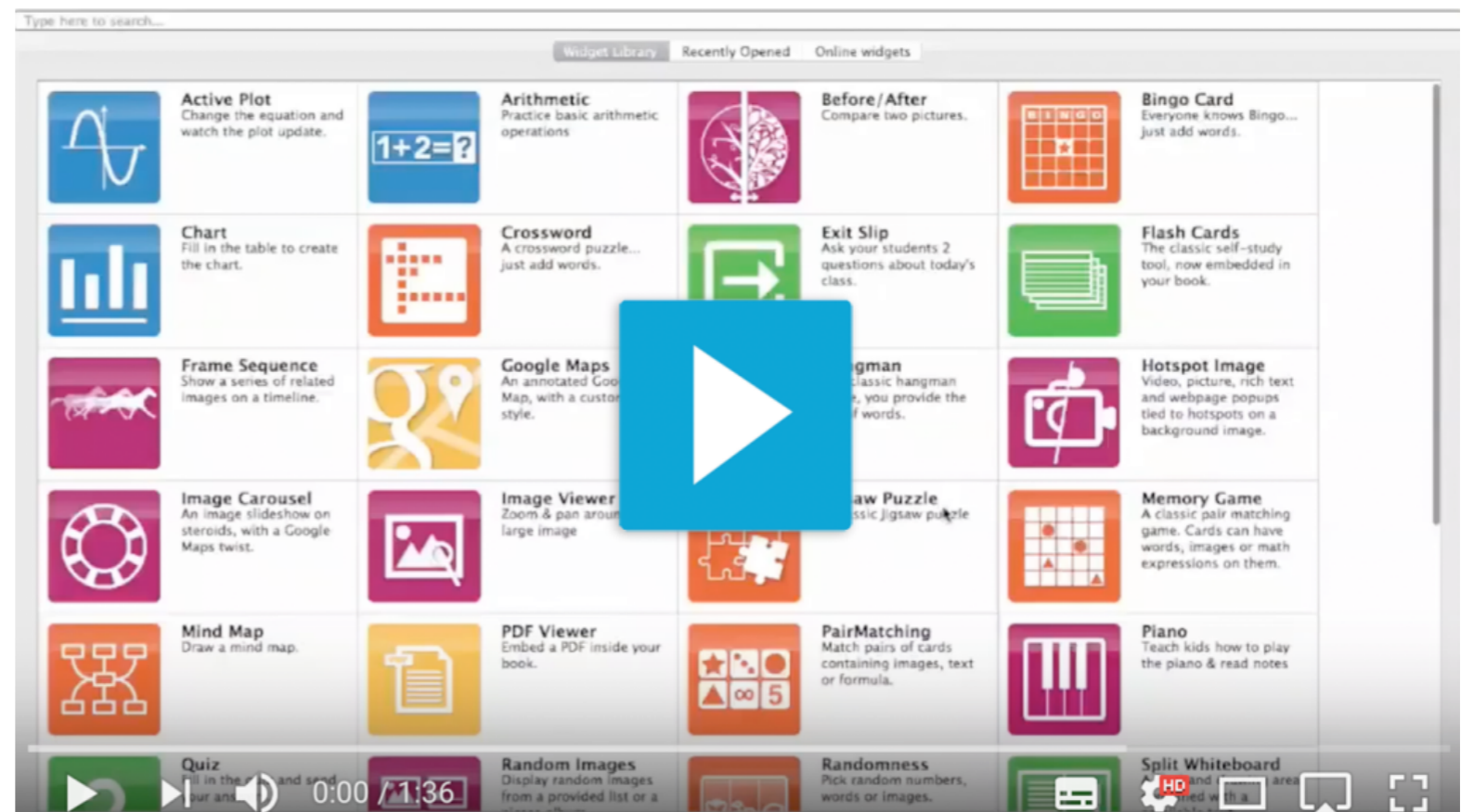
considered: The students can use the whiteboard widget to reconstruct, plan and lastly act out a previously seen tactic from a ball game (ex.3).

As a method for a lesson entry, the Placemat Activity (1) can be used (ex. 4). In this example a desired template

Limits to the Use of the Widget

Figure 7 Screenshot of AWW

is saved as a background, too. This simple option offers a large variety of different entries.

1(footnote) The Placemat Activity is a kind of group work and serves as a part of cooperative learning where ideally four learners build a group and silently collect their thoughts on one piece of paper. By rotating the paper, the students can read about the other students' ideas. In the last stage, the group comes to a consensus and writes it down in the middle of the page.

The widget has its limits for the application in mathematical and scientific lessons, where traditional whiteboards have proven to be of great help. Conventional whiteboard software has special features for mathematical operations as well as a ruler, triangle ruler and protractor. This way, force vectors can be measured directly on the board. However, these options are not available in the widget.

On the other hand, the reduced options of the widget make it more useful to beginners and smaller tasks. The possibility to display different pallets of tools, according to the task, would be a great addition.

Suggestions for Further Improvement

Additionally, the Whiteboard widget has its advantages in inclusive classroom settings. The reduced toolset and the straight forward design of the widget are an advantage.

Alternatively, a Web 2.0 application like AWW A Web Whiteboard, could be used. This cost free, English tool offers ways for the registered user to share results with other participants. Pictures, which can be rotated and cropped, can also be used as a background template.

The sufficiently sized icon bars can be displayed on almost all touch devices very nicely.

A disadvantage of the Web 2.0 tool is, like previously mentioned, the accessibility for the learner. The author has to create individual Whiteboards

for every group and then send them a link. However, the author can also choose on the tools and correct and evaluate the results, without looking at the complete eBook of the learner.

In addition to the advantages mentioned in the 'limits to the use of the widget' chapter, it would be a great improvement to increase the amount of available tools. Those would need to be included by the author depending on the task, in order not to overwhelm the learners. It should be possible to display or hide certain tools while working with the widget.

Furthermore, it would be a great improvement if images for labeling exercises could not only be put in as backgrounds but rather as dynamic and freely movable graphics that can be edited by the author.

Lastly, it would be an advantage if texts could be corrected after putting them in, to correct spelling mistakes.

6 Worksheet Widget

A Description of the Worksheet Widget

Figure 8 Different Types of Tasks
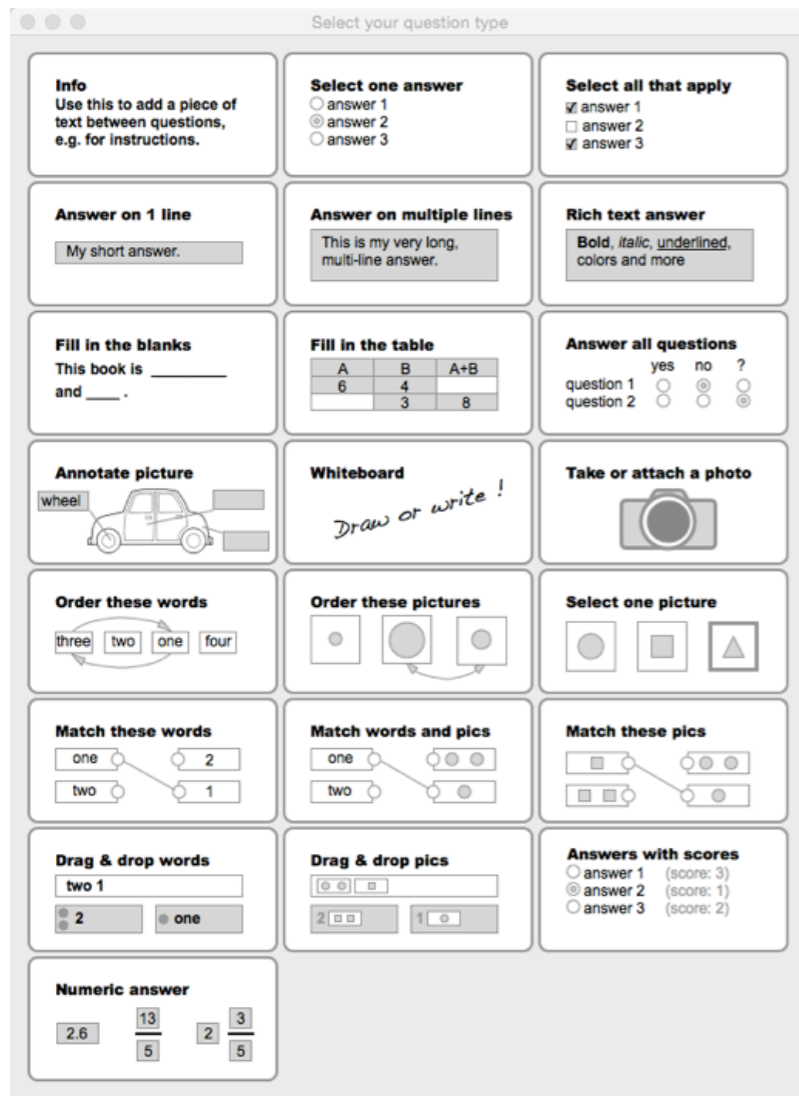
The worksheet widget enables the author to combine different types of tasks into one large, overarching task, not unlike conventional worksheets do. Because of the many possibilities of how to combine the tasks, the Worksheet widget can be used in versatile contexts.

There is a great variety of different types of tasks:

General information, multiple choice questions, open questions, open questions with text editor, fill-in-the-blank questions, charts, labeling exercises, whiteboard tasks, picture tasks, annotation tasks, matching tasks (word-word, word-image, image-image), Drag&Drop matching tasks (word-word, image-image), answers with scores, numeric answers (mathematics tasks)

All of these task types can be combined in just one widget, which makes it easier for the learner to keep an overview and it is also easier to log and check the learner's results.

Through a simple adding process, individual task types can be combined. The widget has a resemblance to Hotpotatoes, an application that could combine HTML exercises without a lot of programming knowledge. The widget furthers self-regulated learning and the students can decide in what order they want to complete the tasks.

The widget increases the learners autonomy. Tasks that cannot be answered can be left out. The learner can go over the left out tasks at a later point and then choose to answer.

## A Possible Scenario in Comparison to the Conventional Method

Additionally, the tasks can be assessed in a differentiated way when correcting them. This offers individual assessment, for example, when reproduction tasks earn a higher score than a simple labelling task.

Exercise sheets with multi-medial tasks can be directly incorporated into the context of the eBook. This prevents students from directly copying the answers from the texts, like it would be possible if they would use a conventional worksheet and a text on a monitor. However, this can also be

realized with the special Split Worksheet widget. With the help of this widget, the information can be displayed on one half of the screen, while the other half shows the worksheet widget.

Multi-medial content, like videos, audio files and animations can be included and directly linked to a certain question. This way, learning is facilitated on several channels. The learner can be exposed to real content and authentic material. An alternative would be the website learningapps.org. The tasks created on this website can be included on traditional worksheets or information texts using a QR-code. In addition to that, the tasks can be directly exported and included in an eBook using iBooks Author.
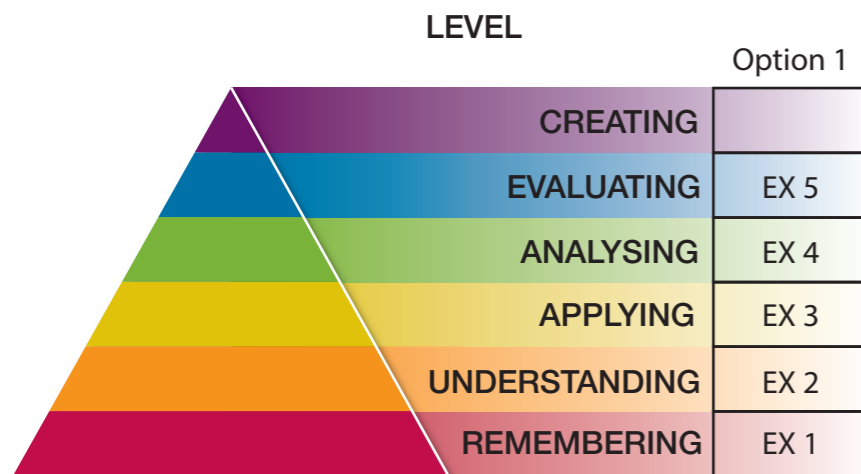
A Specific Example for the Use of BookWidget's Worksheet Widget

Figure 8

Both of the described methods enhance the possible types of tasks and are good additions to exams and tests. The educator is redeemed for time and effort invested in the creation of the tasks when correcting them, especially when teaching several classes at the same time.

Not all possible types of tasks, but rather one complex combination will be explained in the following. Depending on the types of tasks and questions, the tasks created can be classified on different levels of Bloom's taxonomy.

For example, if the tasks are self-correcting or give immediate feedback, that can be classified on level 2, Remembering. This would be the case for ordering tasks with texts and

images, multiple choice questions, matching tasks (word-word, word-image, image-image) as well as drag & drop matching tasks (word-word, image-image) (ex.1).

However, tasks that allow the user to reproduce knowledge and offer an open text box can be classified one level higher, as Understanding (ex.2).

The third level, Applying, is reached, if in a drag&drop matching task pictorial information needs to be encoded. Image description tasks can also be classified on this level (ex.3).

If the author uses lists and charts with fill-in-the-gap style questions, so that the learner has to analyze those charts in order to fill in the correct information, the task can be classified as Applying.

Example

An example would be „Zahlenmauern" (ex.4).

If the exercises are very open and the learner can open the answer in an open text field, the task can be classified under level 5, Evaluate. However, it is important to use deductive and assessment questions. Reflection tasks that let the learner reflect upon his/her own action would be an ideal example for level 5 (ex.5).

Obviously, all these task types can be combined and an internal progression can be created. The Worksheet widget is definitely the widget that covers most levels on Bloom's taxonomy.

The reflection task presented here is made for students and teachers in training. With the help of a video, they are asked to reflect upon their prior knowledge about classroom disturbances. The prior knowledge is in the center of the task. The learners are asked to reflect upon their reaction towards disturbances through the questions asked in the tasks. The goal is to improve their interactional competence. In the video, the learner has to answer questions, and they can then answer with the use of texts and content from the eBook that the widget is integrated in. The so called learning and development tasks are normally paper based and available to the learner in study folders. With the widget, the learner can decide to either use the traditional or the contemporary approach.

How to Develop this Widget

These types of questions are especially great to be incorporated in an eBook.

The widget combines all types of tasks, that are normally created with individual widgets which results in a disorganized design.

Through the whiteboard or picture function, the learner can include images into the widget. This allows for additional design options. This would also be great in the context of a learning and development task on blackboard writings.

Limits to the Use of the Widget

Screencast 6 Development of a Worksheet Widget
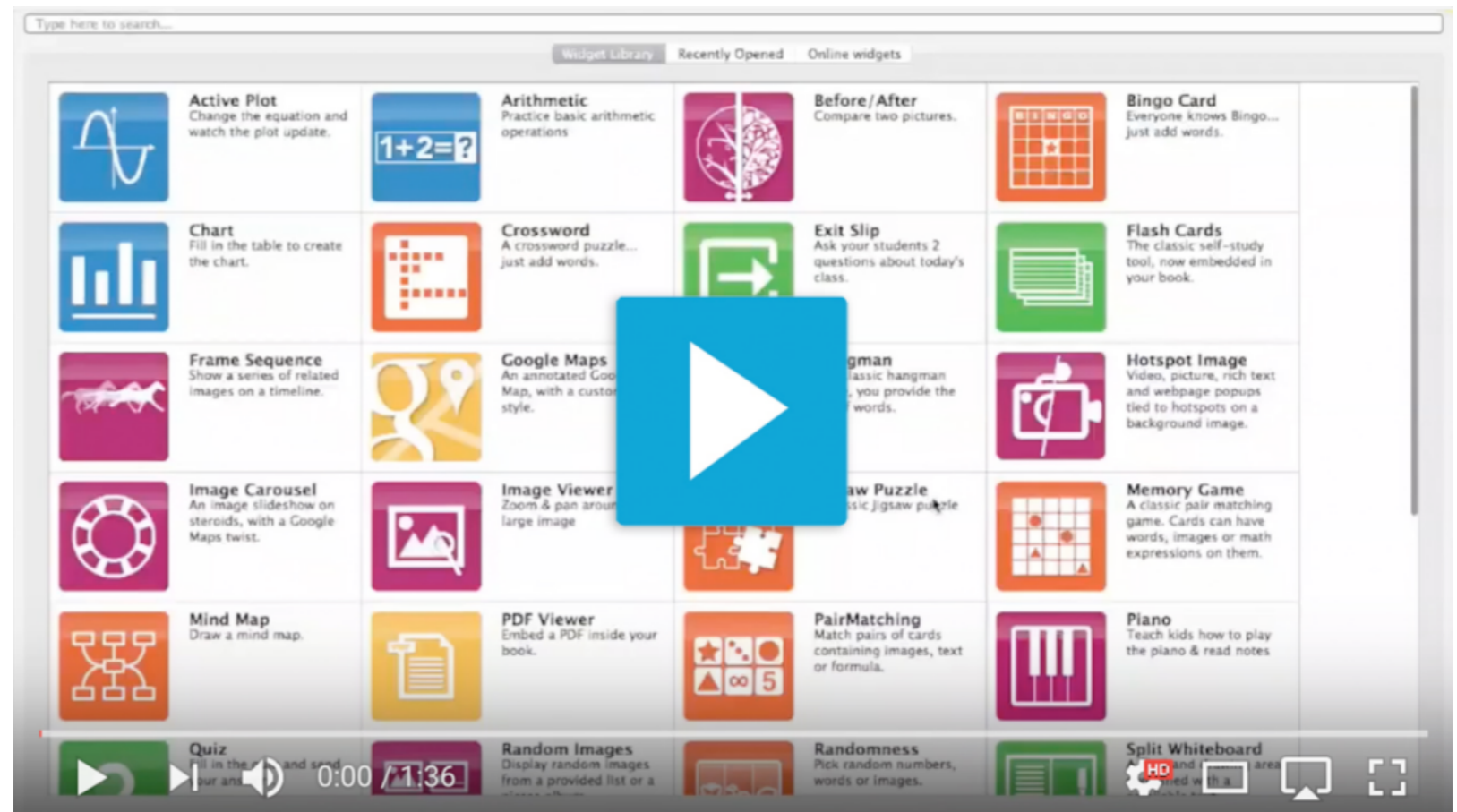
Suggestions for Further Improvements

Since the tasks are to be completed in a portfolio style, a report of the results is not intended. The tracking or report function is not being used. However, personal evaluations can be included both at the beginning and the end of the learning and development task, to make a development visible.

Based on the fact that the report function is disabled, the tutor/educator cannot get insight into the students' learning level. Feedback, therefore, has to be handled in a traditional way, in a face-to-face discussion about the learning progress during a learning conference. This specific limit is only valid for the presented example. At the beginning of a course, the author has to combine and finish up all learning and development exercises in an eBook and include all other media. If

something is added afterwards, it affects the already filled out tasks. It is advisable to save the learning and development exercises as a script in the form of an eBook. This way, the user can individualize the learning process, which will, without a doubt, have a great affect on the learning. This way, the limit would become a type of individualization.

The content structure of this type of exercise is very complex, because the prior knowledge of the learner has to be reactivated as a first step. Formulating the task is just as difficult as it is when using the traditional approach. The widget offers no advantage in this respect.

In general, this widget is very versatile in its use because it combines so many different types of tasks. However, this

is also a disadvantage, since the author has to develop an eye for all different types in order to know when and how to use them correctly. Programming knowledge, even if the report function is used, is not necessary.

It would be a great improvement if the widget could be included as visible content inside the eBook — as a main component. This way the learner could directly link the contents to specific examples.

This is possible with an alternative widget called Split Worksheet. However, it is only possible to make a very short text visible when working on the tasks. Learning and development tasks usually need longer texts, which is why the Split Worksheet widget is

not a good choice for this type of exercise.

The report function, where the learner could give and ask for feedback from the educator, would be another great addition to this widget. It would be great if the learner could type in the email address of the tutor him/herself. This would enforce the learners role as an independent and self-regulated subject and the learner has full control over personal or sensitive information.

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Page 43; Figure 3	Paul Hopkins
Page 45; Screencast 2	Thomas Breig
Page 46; Figure 4	Thomas Breig
Page 49; Figure 5	Thomas Breig
Page 51; Figure 5	Paul Hopkins
Page 51; Widget 3	Thomas Breig
Page 52; Screencast 3	Thomas Breig
Page 57; Figure 6	Thomas Breig
Page 58; Figure 6	Thomas Breig
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Feedback on Book 2

Affordance

A relation between an object or an environment and an organism that, through a collection of stimuli, affords the opportunity for that organism to perform an action.

Verwandte Glossarbegriffe

Drag related terms here

Index Find Term

Artefact

An object created for inclusion in the eBook, these might include text, images, video, slideshow, graphic, widget etc..

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Autonomy

Learning that has freedom from external control or influence; focussed on the learning desires of the student and not the curriculum or the teacher.

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Bloom

Psychologist who develooed a taxonimic system reagrding child development

http://www.learningandteaching.info/learning/bloomtax.htm

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Cognitve Domain

The area of development in the child that is concerned with academic learning

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Core Knowledge

A set of ideas, facts and skills that are deemed essential for further learning and devleopment - often defined in a curriculum set by local or central government.

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Didactics

A method of instruction where the teacher is dominant and centered on the transmission of knowledge (anglosaxon definition). In Germany the word "Didaktik" means any kind of teaching.

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Digital Device

Mobile devices such as Smartphones, Tablets, Laptops or other electronic equipment such as gaming or access devices.

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Digital Print

A book that contains mostly print and images in digital rather than print form

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Ebbinghouse

Psychologist who worked on the ideas of memory

https://en.wikipedia.org/wiki/Hermann_Ebbinghaus

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Ed Puzzle

Interactive video software

https://edpuzzle.com

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Electronic Book

A book that appears in digital form may include a number of multi-media and/or interactive elements.

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Enviorment

The learning space that the students and the teachers occupy: traditionally the classroom but could be other spaces both physical and virtual

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Explain Everything

Capture software

http://www.explaineverything.com

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Factoid

A small piece of information e.g. that Paris is the capital of France

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Immediacy

An interaction between the teacher and the student that takes place during the leanring activities in a synchronous time frame.

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Interactive

Allowing a two-way flow of information between a computer and a computer-user;
responding to a user's input.

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iTunesU

iTunes U is a part of the iTunes Store featuring free lectures, language lessons,
audiobooks, and more, that you can use on your iPod, iPhone, Mac or PC.

http://ituness.apple.com

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Knowledge

Facts, information, and skills acquired through experience or education; the theoretical or practical understanding of a subject.

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Mobile

Using devices whilst moving or working in moving location - e.g. fieldwork

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Network

Devices that are connected to the internet probably via wireless or via mobile data connection (G3 / G4)

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Pedagogical

The function or work of a teacher; teaching; the art or science of teaching; education; instructional methods.

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Physical Space

Learning space that has a phsyical and tangilble dimension.

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Taxonomy

A classification of objects into an organised system.

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Technology

Machinery and devices developed from scientific knowledge; we are espcially thinking of computer technology.

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Virtual Space

Learning space that does not have a phsyical and tangilble dimension.

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VoiceThread

Collaboration software

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Widget

A self-contained piece of software designed for a particular purpose

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Willingham

Cognitive neuroscientist working on learning and memory

http://www.danielwillingham.com

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YouTube

A user provided and curated collection of video snippets

http://www.youtube.com

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