A new approach to the book series ‘Little People, BIG DREAMS: Coco Chanel’ that engages children in Computational Thinking by introducing Coco Chanel: the 3D Designer
In the following I will discuss the product as part of the Research Report ‘How can the fashion industry excite Generation Alpha to acquire Computational Thinking Skills?’. As a result of the 21\textsuperscript{st}-century skills shaping the fashion industry, as discussed in Chapter II, the following product has been created dedicated to Generation Alpha, primary those aged between five and seven years. Nowadays the digital influences are all encompassing, and analysis about the educational aspect that they can bring along have been reviewed in Chapter IV. The aim of this product is to give an example of how fashion and its traditional past can be used and translated in a new era that is currently being shaped. The fashion industry depends on highly Creative Thinking Skills and is about to evolve in an industry that combines Creative Thinking with Computational Thinking. Therefore the following product takes a new approach to the book series ‘Little People, BIG DREAMS’ that engages children in Computational Thinking activities by introducing Coco Chanel: the 3D Designer.

The following skills are key aspect of the product:

PROBLEM SOLVING | COLLABORATING | HAVING GUTS
In chapter III of the Research Report, it was stated that Generation Alpha will have a strong voice and be highly influential in the shaping of the fashion industry. This product looks at how to use the game industries’ assets and fashion industries’ affection among society, to give an insight into future job roles that are being transformed by technological developments. The desired outcome is to entice kids into the future of fashion technology, introduce them to Computational Thinking and give a prototype example of how to address those new evolving job roles. Figure 1 shows the most relevant outcome of the survey ‘Generation Alpha and their use of Technology’ (see Appendix of the Research Report).
Most popular jobs in fashion:

- Designer: 53%
- Blogger: 18%
- Other: 31%

Participants familiar with the use of touch devices:

100%

Hours per day spent on digital devices:

- 3 hours*

What parents look for in a game:

- Overall learning factor: 53%
- Logical thinking: 21%
- STEM: 16%
HOW IT WORKS

Based on the research outcome of the survey conducted (Figure 1), findings show that the fashion industries’ role of a designer is the most desired. According to this result, the book series 'Little People, BIG DREAMS- Coco Chanel' has been chosen to work with further. This series is intended for readers aged between five and eight years and focusses on women who have left their mark on history, Coco Chanel accounting to one of them. The overall idea of the product is to take well-established success stories from the past and translate them into the 21st century. To introduce children to a more technical related work environment of a future designer the success story of Coco Chanel was chosen. The result is an App played on a tablet that turns the existing book into an interactive story in a playful environment. Integrated games slowly introduce the player to the competencies of Computational Thinking and simplified tasks of the fashion industry. The four pillars of an educational App have been taken into consideration to ensure a learning factor along the way (Table 1). The app offers an extension to the traditional story and is available for purchase via the App store. Once a book is purchased, entering the provided code will proceed the downloading process of the App. Once the App has been downloaded the next step, scanning the book cover, starts the interactive storybook and makes Coco Chanel the 3D Designer appear.
Figure 2. How to get started
To adapt the storyline of the book to the current Zeitgeist, all the pages have been rewritten. In the following, a comparison of the new and old story have been made. The numbers listed, indicate the page numbers of the book 'Little People, BIG DREAMS'. Next, to the implementation of Computational Thinking Activities, innovations and tools used in today’s fashion technology industry have been added. A rough overview of the transition of the layout of the pages will be presented in the following pages broaching areas from material innovation to fashion production and presentation.
This is the story of a French girl called Gabrielle. When she was little, Gabrielle lived in an orphanage.

The nuns thought Gabrielle was very strange. She was different and they didn’t like it.

Gabrielle was different. While the other girls played, she liked to sew with a needle and thread.

When Gabrielle grew up, she sewed by day and sang by night. The people watching called her ‘Coco’.

When Coco finally went to bed, she dreamt in shapes and patterns. She wanted to make so many things!

This is the story of a strong-minded French girl named Gabrielle. When she was little, she lived in an orphanage but her vivid imagination always let her travel to different places.

The nuns thought Gabrielle was a bit odd. All the energy and never-ending curiosity in her were just too overwhelming.

And indeed, Gabrielle was different than other girls: As much as she liked to sew, she also loved experimenting with her computer. Curious as she was, she learned a secret language that would open up new worlds to her.

a. Can you help Gabrielle finding her steps to unlock a new world?

When Gabrielle grew up she was sewing day by day but soon realized that she did not fit in. In the evening she sang and people watching called her ‘Coco’.

When Coco went to bed she dreamt in shapes, materials and numbers all eagerly waiting to be combined.

a. Can you help Coco structuring her dreams?
One day, Coco made a hat for her friend. Simple and elegant, it was different to the usual style.

Coco made more and more hats, until she had enough to open a hat shop. Her modern designs surprised the mademoiselles in Paris.

One evening at a party, Coco saw that the other ladies weren’t dancing. Their corsets were too tight and they could hardly breathe!

So Coco created a brand new style, simple and straight. Her dresses and skirts would be comfortable to wear.

At her first fashion show, some people sneered. Coco’s clothes were too strange and different for them.

One-day Coco made a hat for her friend. Simple and elegant but the secret ingredient was a fabric made out of milk.

Coco made more and more hats. As she was poor trying to save money she decided to sell them online. Luckily she knew how to make a computer work.

a. Can you help Coco complete the code?

One evening at a party, Coco saw that other ladies’ dresses weren’t fitting well.

She decided to take the dresses apart and invite people to use her body scanner. The body scanner could measure everyone’s unique measurements and create pieces that would just fit right!

a. Can you help Coco combining the pieces of the dress?

At her first fashion show she decided to invite people into a virtual world where they could explore three-dimensional simulations of her dresses. People sneered as it was too strange and new for them.

a. Do you want to find out what the invitees can see?
But as time went on, Coco showed them that to be stylish you don't need to wear corsets or sparkly sequins...

...and being different might make other people think differently too. That’s why everyone now remembers the young Gabrielle as the great designer, Coco Chanel.

But instead of giving up Coco convinced others to follow her and led the trend of working with technology and making mindful creations.

Along her way she found friends helping her. Meet Zaha an incredible architect. Ada who can bring any magical world to life. Laning who is a fabric expert or Nina a genius who knows how to sell.

a. Do you want to be the next Coco and join forces with your whiz friends? Touch the faces to capture an image.
One day, Coco made a hat for her friend. Simple and elegant, it was different to the usual style.

One day, Coco made a hat for her friend. Simple and elegant but the secret ingredient was a fabric made out of milk.
The secret ingredient in the story refers to the QMilk material: spinning sour milk into silky fibres. This example broaches the topic of discovering innovative and sustainable materials.
Coco made more and more hats, until she had enough to open a hat shop. Her modern designs surprised the mademoiselle in Paris.

Coco made more and more hats. As she was poor trying to save money, she decided to sell them online. Luckily she knew how to make a computer work.
Globalization and advancement in technology made the rise of E-commerce possible. Selling online, can **eliminate costs** of a brick-and-mortar location and can **attract a wider target group**.
So, Coco created a brand new style, simple and straight. Her dresses and skirts would be comfortable to wear.

She decided to take the dresses apart and invite people to use her body scanner. The body scanner could measure everyone’s unique measurements and create pieces that would just fit right!
The atelier of a modern designer: a workflow that combines traditional craftsmanship with new innovations.
FASHION SHOW

At her first fashion show, some people sneered. Coco’s clothes were too strange and different for them.
Making use of magical creations in a virtual world: A new way of presenting clothes.
But as time went on, Coco showed them that to be stylish you don’t need to wear corsets or sparkly sequins.

But instead of giving up Coco convinced others to follow her and led the trend of working with technology and making mindful creations.
Due to the rise of mobile devices and their various applications, instant connectivity has **strengthened the power of Bloggers** in the Fashion Industry.
... and being different might make other people think differently too. That’s why everyone now remembers the young Gabrielle as the great designer, Coco Chanel.

Along her way she found friends helping her. Meet Zaha an incredible architect. Ada who can bring any magical world to life. Lanying who is a fabric expert or Nina a genius who knows how to sell.
The collaborative Selfie:
Using the integrated camera to capture friends’ faces to start building an amazing new team.
In chapter IV of the Research Report, it was discussed that due to the continuously rising number of Apps available on the App store it is hard to evaluate every App individually. Therefore, the association for psychological science has created an evidence-based guide (Hirsh-Pasek et al., 2015) for researchers, designers and educators to set a standard for assessing children’s Apps according to their educational relevance. Table 1 will show how the key aspects mentioned in the guide have been translated into the end product. Furthermore, an introduction into Computational Thinking-Activities in form of small games, that are discussed on the following pages, have been implemented.
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<td>Arrows allow to follow the story at one’s own pace</td>
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<td>Reward children with items placed in the shopping bag that will come together on the last slide</td>
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<tr>
<td>MEANINGFUL LEARNING</td>
<td>Sustainable and useful learning comes from experience that connect to our existing knowledge</td>
<td>The extension of the existing story makes a connection to the modern world and shows that past-events can be even of more value when their essence becomes a today’s relevant twist to it</td>
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<td>SOCIAL INTERACTION</td>
<td>Social interaction is central to learning: observe and imitate</td>
<td>Find some whiz friends: collaborate in the physical world and value everyone’s unique field of interest</td>
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BONUS KNOWLEDGE
On the following pages, this section provides extra information to adults seeking for explanatory material.
Algorithm
Decomposition
Computational Thinking
Abstraction & Generalization
Evaluation
THE GAME
Algorithmic Thinking is an essential skill when it comes to communicating with machines. By dragging and dropping the instruction cards on their correct position, creating a sequence of instructions, Coco will move from her initial position A to the desired position B. This step-by-step procedure follows the basic principles of programming. The figure can only make it to her end position once all the cards have been placed correctly. As a result, a visual connection to the computer will appear typing the words “Hello, World!”
BONUS KNOWLEDGE

A "Hello, World!" program is traditionally used to introduce novice programmers to a programming language. It illustrates the basic syntax of a programming language for a working program and in this case draws a connection between giving step-by-step input and receiving an output message.
ABSTRACTION & GENERALIZATION

focussing on important details and looking for similarities in existing groups of patterns

THE GAME
This game looks at the similarities in construction of three different garments. It starts off by matching the garment with the chosen material. As all of the three garments are made out of woven materials, the next step is to find the card with the matching construction. This memory game should slowly draw a connection between the garment and the construction of the material used. The final step is to complete the example pattern by placing the grey squares onto its correct position in a drag and drop manner.
The crossings of weft and warp are offset to give a diagonal pattern on the fabric surface.

Complex arrangement of warp and weft threads, which allows longer float threads either across the warp or the weft. The reflected light creates a smooth, shiny surface.

Variation of plain weave, basket weave creates an attractive checkerboard pattern, often using contrasting colors in the warp and weft.

**BONUS KNOWLEDGE**

In general, most fabrics are made by weaving or knitting yarns, whereas non-woven fabrics are made by bonding or felting fibers together. The construction of a fabric influences the appearance and end use. Woven fabrics are made up of a weft - the yarn going across the width of the fabric - and a warp - the yarn going down the length of the loom.
DECOMPOSITION

is a way of thinking about problems, algorithms, artefacts, processes and systems in terms of their parts

THE GAME

Before a garment can be sewn together, first it’s individual pieces, so-called pattern pieces, need to be drawn in 2D. In the industry pattern drawing programs are already in use whereas 3D programs, simulating the pattern pieces in 3D, are slowly becoming more popular. So called virtual prototyping, allows to work more accurate and can limit the amount of prototypes needed, ensuring a more sustainable way of working. This game gives an insight in how 2D pieces can be put together in order to become 3D.
**BONUS KNOWLEDGE**

Nowadays advancement in 3D softwares convinces more and more designers to work virtually. Some advantages are being able to translate ideas faster, making instant variations and working more sustainable.
THE GAME

In the story it is mentioned that Coco wants to save money, therefore decides to sell her creations online. This is a decision made based on evaluating her current situation. The goal of the game is to drag and drop the color circles onto the correct position in the 'If-Statement'. This game is closely linked to the basic of programming, similar to the algorithmic game. It shows that if you do not press anything the the color of the hat will remain red. Once you press blue the hat will change to blue and the same happens to the orange button. In general users expect those things to happen without knowing how the computer recognizes this actions.
BONUS KNOWLEDGE:
The 'If-Statement' also known as Conditional Statements are just another set of rules used by the computer to identify an action. 'Else' has the same meaning as 'otherwise' or 'instead'. This statements check to see if certain situations apply to an action of the user. Another example would be deciding on where to go for a swim. If it is sunny one will go to the sea else one will go to the indoor pool. Therefore one needs to check the condition of the wheater and will act accordingly.
The overall goal of the story is to finish the small Computational Thinking Activities and be rewarded with items placed in the shopping bag. Once an activity has been completed it will automatically go in there. On the final page one will find different characters with the collected items on them, highlighting their field of expertise. The underlying message is to find friends and capture their faces to create one’s own crew consisting of individual experts. As interdisciplinary collaboration can fuel any project and open new possibilities it is vital to value everyone’s uniqueness and have the guts to be different.
BONUS KNOWLEDGE:
The first names used to describe on the final page are all woman who are incredible in their fields. Zaha Hadid an Iraqi-British famous architect, Ada Lovelace an English mathematician known as the first computer programmer, Lanying Lin a Chinese scientist in the material engineering field and Nina García a Colombian fashion journalist and critic.
KEY PARTNERS

Institutions

Current professors and lecturers teaching in the fashion industry (see the Appendix of the Research Report for the full outcome) believe that problem-solving abilities related to fashion technology will gain more importance. Next to that independent thinking, collaborating, exchanging ideas and learning to play with systems by trial and error is in demand.

In addition to the overall change in the industry and the workforce it requires, other aims include:

- Introducing kids to a shift of traditional job roles
- Eliminate misconceptions of computing-related careers
- Boosting cogitative abilities by combining Computational
Thinking with Creative Thinking
- Having the guts to do
differently and collaborating
interdisciplinary

Publisher/Authors
The primary assets to work with
are stories and books dedicated
to children. The extended stories
translates the success stories in
today's world and makes them
more relevant and tangible.

FUTURE OUTLOOK/
POSSIBILITIES:
Due to limitations in time and skill-
set the initial idea of translating
the product in augmented reality
couldn't be realised. Therefore, I will
leave that for the future possibilities
to create an extension content that
fully works in augmented reality.
Instead of creating a separate App
that tells the extended story the
iPad could be placed over the book
and bring the content in that way to
life. Augmented Reality is a strong,
collaborative and very visual
element to work with in education
and storytelling once the content
used is of value.

VALUE
Figure 3 shows how current
problems and missing
opportunities have been translated
into the end product to generate
value for the fashion industry as
well as Generation Alpha and their
Millennial parents.

Institutions
It is vital for the fashion world to
change their mindset of how to
make use of new innovations
in the industry. It is in need of
a wave of young creatives fully
embracing the collaboration of
fashion and technology. Showing
kids from early on that there is a
big opportunity of working with
technology in a highly creative field
can fuel their interest of forming
new visions without falling back
into old habits.

Generation Alpha is tech-savvy and
knows how to interact with digital
devices. When digital tools not
solely serve for pure entertainment
but also bring an educational and
reality aspect along, than their
interest for technical fields can rise.
Millennial parents (as highlighted
in Figure 1) are in favour of STEM
related games and activities that
balance play and education.
Shift of 21st-century Skills
How to prepare the next generation with skills relevant in a symbiosis of a digital and physical world?

Generation Alpha
- born after 2010
- digital natives
- tech-savvy

FASHION INDUSTRY
A new wave of young creative that are combining design, coding and engineering and prevent falling back into traditional habits.

Expose the versatility of the industry and use it as a motivational driver to broaden their scope of technical skills applied.

Computational Thinking Skills
a problem-solving skill that can bridge the gap between man and machine

start working in the industry with completely new input

engage to look beyond traditional job roles

How
in a playful manner invite kids to get an insight of the industry and slowly introducing them to CT

Desired Outlook
to broaden their view on technical related fields and change their way of thinking from early on

Figure 3. From Insight to Product