FASHION × GAME

How can the Fashion Industry excite Generation Alpha to aquire **Computational Thinking Skills**?

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ABSTRACT

The idea of acquiring Computational Thinking Skills gained recent interest by institutions and companies as part of the core competencies shaping the 21st-century. Due to existing stereotypes and gender roles in technical related fields, research has been carried out in how to best excite kids about new technological related professions. Therefore, in this paper, I'm discussing the key Computational Thinking constructs and how these ideas relate to existing activities within the fashion industry. As a result, connections have been made between simplified activities carried out in the fashion technology industry and computer science. Lastly, I looked into how these ideas can be translated best in an engaging environment that is educational yet entertaining. Latest research suggested that touch devices and apps can be highly educational once the design process follows the four pillars of educational apps (discussed in chapter four). Therefore, the end product is presented in an interactive storybook played on a touch device. In conclusion, it is suggested that in order to improve one's problem-solving skills in a highly creative industry it is best to combine Creative Thinking with Computational Thinking and to find solutions that are relevant in a symbiosis of a digital and physical world.

PREFACE

After completing a Front-End Development course at the New York Code & Design Academy, I decided to explore in how far this acquired skill set can help me during my educational path at the Amsterdam Fashion Institute. During my past years at AMFI, I decided to pursue technical related minors complementing my programming skills with 3D software like CLO3D, Lectra Modaris, and Autodesk Maya. During this time, I had the possibilities of making use of various programs ranging from design, production to presentation and challenged my way of using technology within given projects. From my experience, a basic understanding of technology not only allows to translate ideas in the digital world but also helps to create them. The digital world acts as an extension to the physical world and a source of inspiration in a trial and error manner. Throughout my education, I had the opportunity to collaborate with Game Design students who helped me in pushing my interest in technology and interdisciplinary working forward. Thereby, I believe in a versatile system that makes room for various disciplines. An essential aspect of a seamless communication is a base understanding of the other's field of expertise. Finally, due to gender and industry stereotypes and prejudices, varying from the fashion industry itself to technical job roles, I hope that the next generation can eliminate gender stereotypes by getting them excited about the use of technology from early childhood on and showing those kids various fields and job roles technical skills can be applied.

Lara-Anna Wagner

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PART I

INTRODUCTION

I.I RELEVANCE OF THE REPORT

Currently, society finds itself existing in a paradox of time. Innovation and productivity are at its peak but peoples' skillset and organizations way of operating aren't keeping up (Ross, 2017). The great success of our information technology leads to a constant pressure of instant connectivity, availability and performance (Chioccariello, 2017). Any piece of information is only a few clicks and touches away and has therefore radically changed how people work across industries (Chioccariello, 2017).

The fashion Industry, in general, has an immense impact on society and plays its social role of capturing the Zeitgeist (WGSN Insider, 2017). Currently, it finds itself struggling in the middle of the 4th Industrial Revolution

which is said to be a 'technological revolution that will fundamentally alter the way we live, work and relate to one another with an intense focus on interdisciplinary team-working' (Schwab, 2016). The industry recognizes missing gaps and knowledge, creating an obstacle for people to fully embrace the collaboration of fashion, science, and technology (Abnett, 2016). Daniel Seo, CEO of CLO 3D enterprise states in an interview (Seo, D. , 2016), that technology is becoming an ever-increasing component of the industry and points out the definite need for early introduction of STEM[1]-related studies among the younger generation.

Generation Alpha, consisting of those born after 2010, solely consists of purely digital natives who are exposed to technology from their early childhood on, often referred as 'Screenagers' who are 'tablet-trained before they are toilet-trained' (Adegeest, 2016). Interacting virtually and using devices for various activities has become the norm, but the percentage of people actually understanding the concepts of those tools is falling behind (M. Wing, 2008). Knowing about computers and how they work teaches people how to think and collaborate in an interdisciplinary environment of man and machine. It can help to break problems down into small parts that become more tangible and solvable (Ross, 2017). Right now the heavy exposure of technology is viewed critically as it is feared to solely serve the purpose of pure entertainment (Podeszwa and Baron, 2017).

The video game industry, like the fashion industry, is part of the art world and is very influential amongst young generations. Chris Melissinos, author of 'The art of Video Game: From Pac-Man to Mass Effect', argues in his book that our children are being born into a world in which the digital and physical collide, and video games are the expressive voice of that collision (Melissinos and O'Rourke, 2013). Currently, the industry and STEM fields, in general, undergo a diversity problem where women are underrepresented (Slye, 2016). In an interview carried out in Sporttechie, founder of Textronics argues, a possible reason for that might be girls having not always been rewarded or encouraged at an early age to pursue technical related studies (Slye, 2016). As the lines are clearly blurring and cross-interest rises, the potential of broadening and motivating Generation Alpha about the

diversity of skills needed can bridge the gap between industries, genders and combine things that are fun and educational (Melissinos, C. and O'Rourke, P. ,2013).

I.2 AIM

It is a fact, that big data has become an integral part of our lives and by the time Generation Alpha enters the workforce it will have highly influenced and changed how society communicates, works and lives. It is said that ninety percent of the world's digital data has been generated over the last two years and grows every year by fifty percent (Ross, 2017). In the book 'Industries of the future' by Alec Ross, Former CEO of eBay, John Donahoe, even takes it as far as stating, if he would have to reconsider his educational path he would enroll in computer science or engineering studies (Ross, 2017). More and more people realize the rising importance of technology and the digital world alongside our physical environment (Ross, 2017). Facilitating an understanding of both worlds is crucial to not only navigating the environment but also shaping it. Therefore, motivating the young generation to influence the algorithm that drives them can fundamentally change how they interact with the digital world (Manches and Plowman, 2015). If we take a closer look at the fashion industry, we can clearly see an emerging interest and drive to work interdisciplinary making use of the magical creations the digital world has to offer. Arthur C. Clarke, a British science fiction writer, once wisely formulated the well-known adage 'sufficiently advanced technology is indistinguishable from magic' (Clarke, 1973). Institutions and laboratories try to bring fashion out of its box by engaging with other fields and eagerly hoping for the next wave of young creatives to bring a new mindset along with them (Hoang, 2016). It has been noticed, that job profiles are changing and that people who have a diverse skill set are highly appreciated as they can bring 'unique expertise to a classic challenge' (Slye, 2016). Computational Thinking is a way humans solve problems based on processes, either by a man or a machine (Saez-Lopez, Román-González and Vázquez-Cano, 2015). In other words, it can help eliminating the fear of entering unfamiliar territory and establishing problem-solving skills that break issues down into small parts, looking at them in a way that a computer or cross-field co-worker can understand (Anon, 2017).

In the following report it will be discussed how fashion's profound role among society can be used to excite Generation Alpha about an early understanding of

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[1]science, technology, engineering, and mathematics, considered as a group of academic or career fields (often used attributively): degree programs in STEM disciplines;

Computational Thinking Skills with the help of educational gaming. This can ideally help eliminating misconceptions of computing related careers and broaden the scope it applies (Slye, 2016).

I.3 METHODOLOGY

This report combines research in three major fields: The Game Industry, the Fashion Industry and in Computer Science. Findings and overlaps of the industries and assets have been pointed out and combined in an end product which is described more in depth in the 'Product-Description' booklet.

To acquire a general overview and idea of the scope of the topic a keyword search was conducted using Hva Bibliotheek and Hva Kennisbank databases. Some of the following keywords have been used: ("fashion technology") OR ("21st century skillset") OR ("computational thinking") OR ("educational gaming") OR ("Generation Alpha") OR ("design thinking") OR ("computational fashion") OR ("coding") OR ("video games") OR ("STEM") OR ("STEAM") OR ("Generation Glass") OR ("social gaming") OR ("fashion game") OR ("wearables") OR ("technology education") OR ("problem-solving skills) OR ("alpha influencers") OR ("computing creativity"). This research resulted in several articles and reports building the foundation to this research report[2].

Due to the fast evolvement of technology and inventions, published articles and reports tend to not always be up to date. Therefore, several trend forecasting websites have been used additionally: 'WGSN', 'Stylus', 'BoF' and 'McKinsey & Company'. They predict attitudes and behavioral developments of social demographical and industry developments.

Interviews and surveys were carried out with lecturers from the Amsterdam Fashion Institute, professionals from different disciplines and observations of Generation Alpha. The full interviews and surveys can be found in the Appendix an overview is given on the following page (Figure 1).

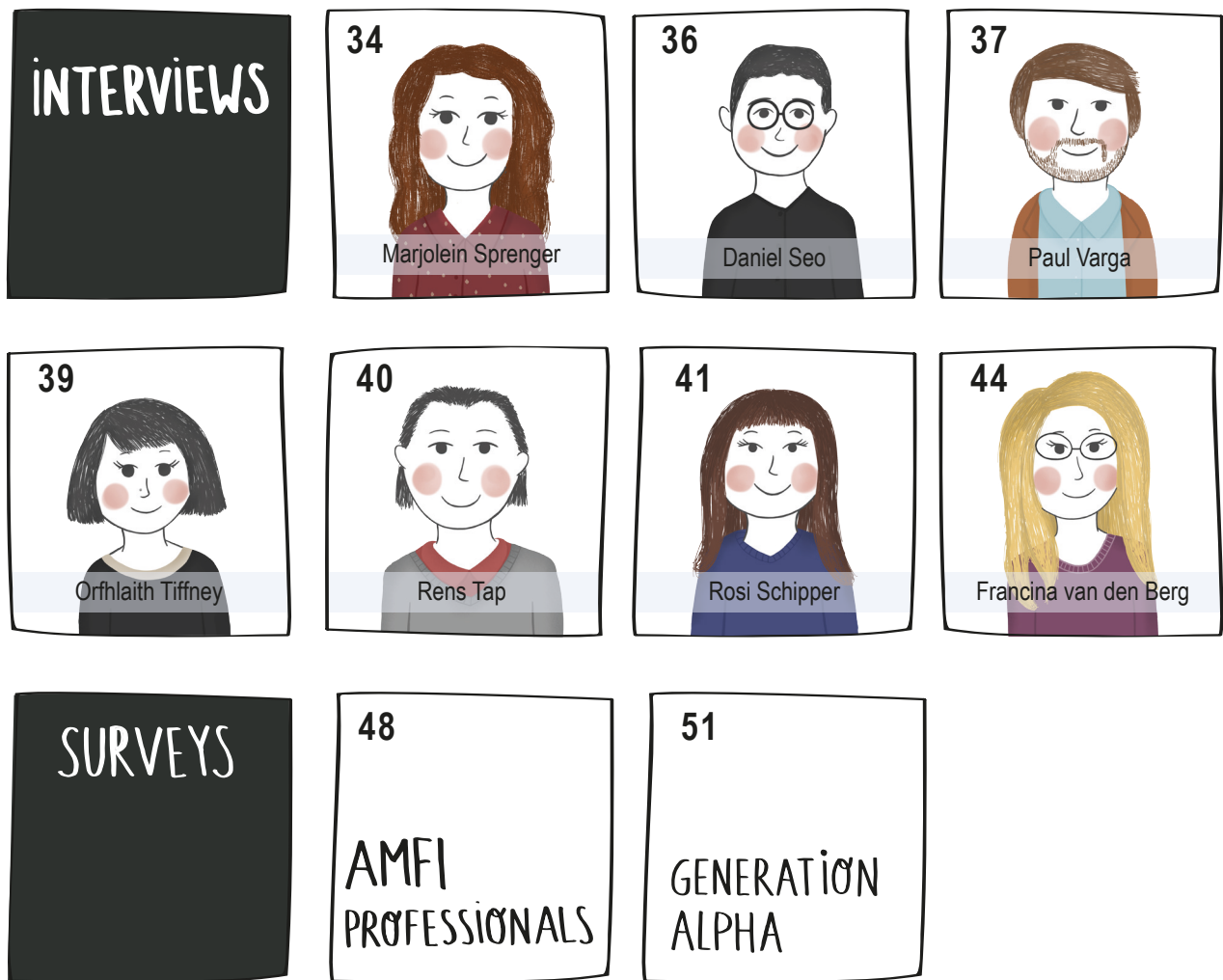[2] all relevant material can be found in the source list (see appendix)

Figure 1. Overview of Field Research

PART II

COMPUTATIONAL THINKING

2.1 DEFINITION

The term Computational Thinking defines the process of 'solving problems, designing systems and understanding of human behavior, using the fundamental concepts of computer science' (Saez-Lopez, Román-González and Vázquez-Cano, 2015). As the amount of data we have at our disposal grows exponentially the importance of dealing and making sense of the information we are confronted with leads to a rise of new job positions. Those positions require skills necessary to the 21st century work shift, Computational Thinking Skills being one of them (Davies, Fidler and Gorbis, 2011). Computational Thinking Skill are an iterative process evaluation undergoing three main stages: a) problem formulation, b) solution expression, c)

solution execution and evaluation (Saez-Lopez, Román-González and Vázquez-Cano, 2015).

In other words, Computational Thinking Skills can train one's mind to recognize how a current issue might be similar to a problem that has already a known solution by breaking this problem into parts, abstracting out details and constructing an algorithm (Figure 2). Although the term 'Computational Thinking' dates back to the 80's, it was brought up again when used by Jeannette Wing, Corporate Vice President of Microsoft Research, suggesting that 'the ability to think computationally is beneficial for everyone across multiple disciplines from social studies to art and even sport' (blog.stephenwolfram.com,2017). To bridge the gap between man and machine and to guide a better way through today's increasingly data-intensive and digital industries, there are a considerable number of studies (blog,stephanwolfram.com, 2017; Shailaja, 2017; Yadav and Hong, 2016; Davies, Fidler, and Gorbis, 2011; Saez-Lopez, Román-González and Vázquez-Cano, 2015) pointing out the relevance for acquiring Computational Thinking Skills to be able to adapt to a changing environment.
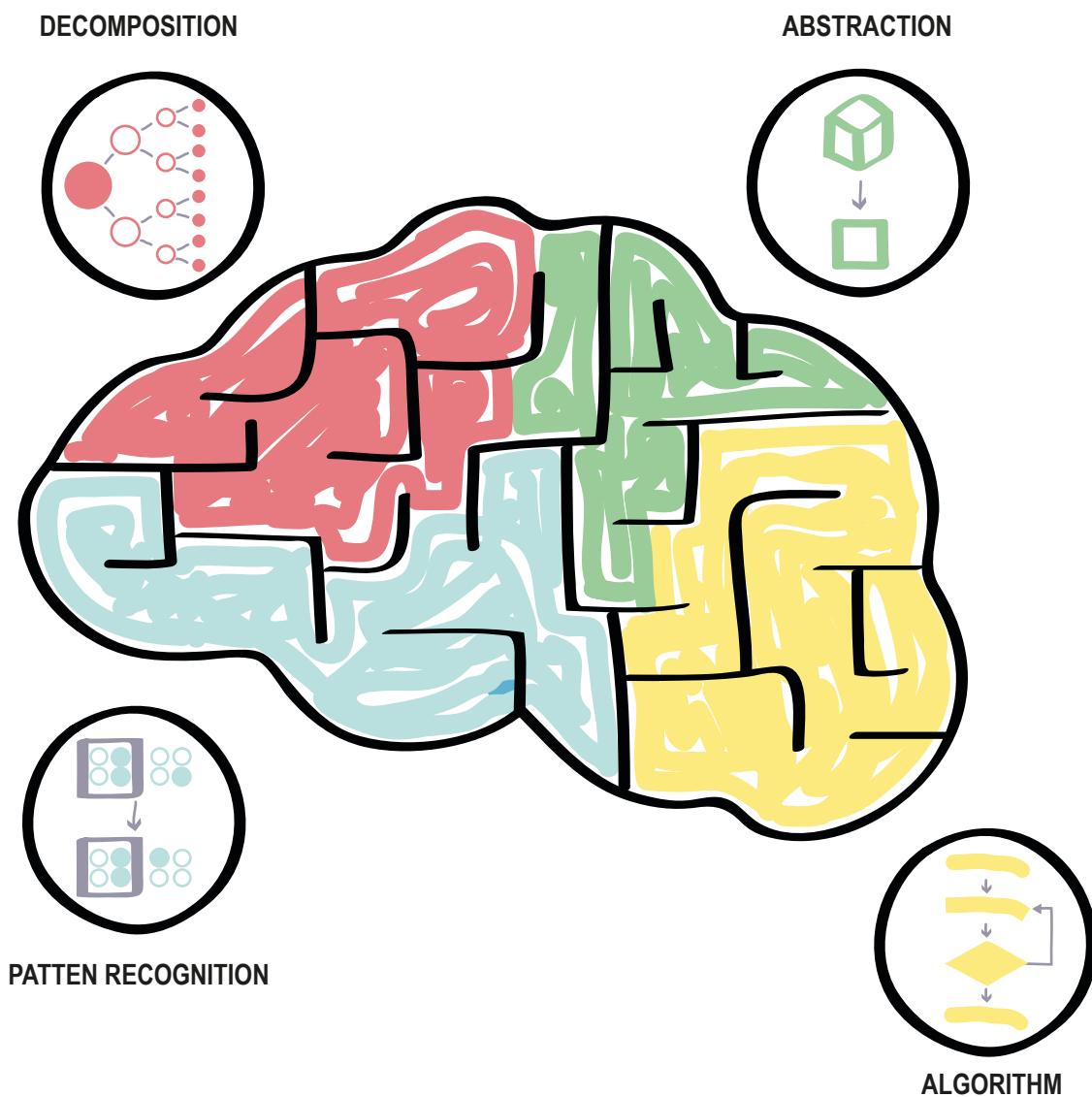
DECOMPOSITION

ABSTRACTION

PATTEN RECOGNITION

ALGORITHM

Figure 2. Computational Thinking (Bbc.co.uk, 2016)

2.2 IDENTIFYING COMPUTATIONAL THINKING PROCESSES

Several arguments have been put forward, stating that people with CT[3] skills can think algorithmically, visualize things through abstraction, compare and contrast situations to arrive at a solution by decomposition (Shailaja, 2017). As stated in the discussion about the 4th Industrial Revolution, there is a fear and misconception of technological understanding and who it is intended for (Abnett, 2016). In the past, you had to be a nerd by heart guiding your way through the study of computer science. Nowadays knowing how to interact with the machines and creating a common language and plan of action doesn't require to be a specialist anymore. In an interview conducted with Marjolein Sprenger, storyteller and founder of Bits&Bots, she states that Computational Thinking is making a lot of links with the everyday life and can therefore be found in a variety of task not limited to the science of computing (Sprenger, 2017). According to Stephan Wolfram, a computer scientist, physicist, and businessman, Computational Thinking provides a framework for everyone that makes things more transparent and easier to understand (blog,stephanwolfram.com, 2017). The cognitive process of Computational Thinking involves logical reasoning, making sense of things by analyzing, thinking thoroughly and precisely and encompasses the following five stages (Csizmadia, Curzan and Dorling, 2015).

Algorithm (AL):

An algorithm is a process or set of rules of concrete steps that can be followed to solve problems or perform a task (Liukas, 2016). Starting from an initial state and formulating instructions to produce the desired output. Translating this idea and structure to the fashion industry it, for example, finds resemblance in a sequence of operations. A rough operational process would be: finding inspiration, sketching a garment, creating the patterns accordingly and sewing them together. The more detailed instructions are given, the more accurate the outcome will be. Taking the example of sketching a garment and breaking it further down leads to questions as "What tools do I need for sketching?", "How many garments do I have to sketch?", "What defines a garment?".

Decomposition (DE):

The process of decomposition helps to break problems or challenges down into smaller parts. By doing so, it creates smaller steps to be evaluated separately and to make it more accessible for solving. A visual translation of this process would therefore be the detection of a mistake in production. Getting a fit right requires precise measurement and accuracy in the division of ease. Therefore, if a garment is too tight or saggy, a patternmaker and seamstress could go over the pattern pieces individually to spot the mistake instead of only examining the finished garment.

Generalization (GE):

Generalization includes the process of pattern recognition and serves the purpose of identifying and exploiting patterns to find solutions to previously solved problems. Taking material science in consideration, an already defined material can be used as a guidance when having to analyze an unfamiliar structure. Identifying its pattern construction helps to distinguish different properties and categorize them accordingly.

Abstraction (AB):

Abstraction is the 'process of making an artefact more understandable by hiding details.' Considering the floor plan of a department store which is an abstraction of the building and its sales pieces. The complexity and crooked sections of the interior can easily lead to confusion and therefore hiding the less important details forms a clear overview of the important things. By making use of Abstract Thinking unnecessary details can be left out and the focus can therefore be put on elements helping to make concepts and descriptions more clear.

Evaluation (EV):

Evaluation is ensuring a good outcome to its purpose. Sales figures and profit margin are an immediate assessment of how well a product was selling, as well as customer satisfaction. The evaluation process, therefore, measures a given outcome based on formulated goals or criteria's.

Table 1 highlights the link of Computational Thinking Activities between the Fashion Industry and Computer Science*.

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[3] Computational Thinking
* All examples given are just suggestions of overlays but are certainly not limited to those activities

2.3 CREATIVITY AND THE THINKING PROCESS IN THE FASHION INDUSTRY

The fashion industry is a global, highly creative and dynamic industry, relying on creative problem-solving skills ranging from design to sales (Karpova, Marcketti and Kamm, 2013). Creativity is the ability to view things in different ways forming innovative combinations linked to 'other fundamental qualities of thinking' including flexibility, ambiguity, and unpredictability (Franken, 1994). The term can be split up in a problem-solving skill and an artistic talent. In a study of fashion industry professionals (Karpova, Marcketti and Kamm, 2013), it was explored that creativity regarding problem-solving can be trained but regarding artistry has to come with a certain talent to be developed further. According to that finding, this research report focusses on the ability to improve one's creativity regarding a thinking process in a symbiosis of the digital and physical world (Karpova, Marcketti and Kamm, 2013).

Researchers argued that Creative Thinking consists of three skills: a) seeing problems outside of conventional boundaries, b) differentiating between ideas worth pursuing, c) marketing one's ideas to others (Robert J. Sternberg, n.d.). In a more recent study (Qian and Clark, 2016), it is outlined that being creative includes innovative and divergent thinking, originality and the ability to view

Table 1. Computational Thinking Activities in the Fashion Industry

ABRV.	EXPLAINATION	COMPUTER SCIENCE	FASHION INDUSTRY
AL	Clear definition of steps to get to a solution	Learning an algorithm for multiplication or division	Sequence of operations, process flow
DE	Think of artefacts in terms of their component parts and simplifies the process of understanding and designing large systems	Development of a game, create different sections independently and bring them then together	Pattern pieces, from 3D to 2D
GE	Identifying patterns, similarities and connections, quickly solving problems based on previous defined solutions	recognizing shapes, sounds or images	Fabric construction E-commerce
AB	Choosing right details to hide so that a problem becomes easier to solve	Computer program that plays chess	Floor plan in department store Concept creation
EV	Ensuring a solution is fit for purpose, including trade-offs as there is no single solution for all situations	Constant development of computer interfaces to meet the needs of different users	Sales figures, profit margin, customer satisfaction

failure as an opportunity to improve. In an interview with Director and founder of Fashion Solution, Francina van den Berg, she states that a lot of things will go automatic or by the computer in the future, but design and creativity will not be replaced but rather change in ways where creatives can use the computer and automatization better or in new ways (van den Berg, 2017). There seems to be an interest by young creatives in the use of technology but the actual skill is lacking (Tap, 2017). According to Dr. Kaufman, a psychologist known for his research on creativity, the impact of new digital tools is not only reshaping our current world but also opens up our minds for possibilities we couldn't have imagined before (Think with Google, 2017). The tech-influences in the fashion industry are enormous and all-encompassing, and a new wave of young creatives are more and more embracing the digital culture (van den Berg, 2017). This particular type of change in the industry not only requires an open audience and mindset but essentially also a new kind of skillset (Hoang, 2016). In fact, the more intuitively, seamlessly and effortlessly the merging of a highly creative industry and a technical field can take place the smarter we all get (Future Now: the new body language, 2017). Boosting our cognitive abilities by combining Computational Thinking with Creative Thinking can strengthen STEM disciplines and expand students' ability to solve complex, ill-defined and interdisciplinary problems (Network, 2017).

2.4 21st CENTURY SKILLS SHAPING THE FASHION TECHNOLOGY INDUSTRY

In the book 'The Jobs Revolution: Changing How America Works', Richard Riley, Secretary of Education under President B. Clinton stated 'We are currently preparing students for jobs that don't yet exist, using technologies that haven't yet been invented, in order to solve problems, we don't even know are problems yet' (Gunderson, Roberts and Scanland, 2004). A study (Trilling and Fadel, 2009) on the shift of 21st-century skills requirements highlighted the new mix of competencies needed during the information age. Showing a decline in routine manual work and a need for people with communicating and expert thinking skills underlining the replacement from 'brainpower to brawnpower'. As shown in Figure 3 and Figure 4, creative work ranging from disciplines in development, research and design are gaining importance, where its primary focus lies in

acquiring and applying new knowledge quickly to a dynamic environment. Problem-solving, communication, collaboration and knowing how to use technology are imperative (Trilling and Fadel, 2009).

It is prognosed that over the next decade, advances in technology will create new forms of man-machine symbiosis, expanding and even redefining what we can do as humans and building on our mutual strengths (Human+Machine- Future in Full Color, 2015, Davies, A., Fidler, D. and Gorbis, M. 2011). The global network enables mobility, flexibility, and diversity within a professional environment and fuels collaborations with a diversely skilled team across the globe to create and solve complex problems and deliver. Therefore, it is said to specialize in a core principle of a field of knowledge and combine this with knowledge of different areas to create new things and being able to adapt continually (Renema, 2017). The ideal future worker is 'T-shaped' (Figure 5) bringing an in depth understanding of one field and being able to converse in the language of a broader range of disciplines (Davies, A., Fidler, D. and Gorbis, M. 2011).

Today, big data, wearable technology, new materials and sustainability have gained a wide audience of interest in fashion and are currently shaping the industry (Tap, 2017). Sabine Seymour, founder and chief executive of Supa, argues that the fashion industry requires a new skill set with a more comprehensive understanding of digital technologies (Hoang, 2016). From design to production to sales and promotion, the digital influences are creating wider implications asking to 'combine design, coding, and engineering'. Therefore it will be a time of 'everything is programmable, an era of thinking about the world in computational, programmable, designable terms' (Davies, A., Fidler, D. and Gorbis, M. 2011). Currently, it is said that students lack the ability to work and collaborate across multiple disciplines, sometimes having to worry more about the execution of an idea than actually developing it (Tap, 2017). This can often result in unacted ideas which leave the person in the position of being imaginative rather than creative (Brainworldmagazine. com, 2017).

Technology and fashion, sometimes referred to two different fields, have more in common than visible at first and can highly benefit from one another. Taking a closer look at a computing curriculum, there is also a surprising amount of creative process taught. Writing lines of codes, making videos, animations and building websites all of those creations require a good amount of creativity (Umaschi Bers et al., 2013). Technologies purpose and
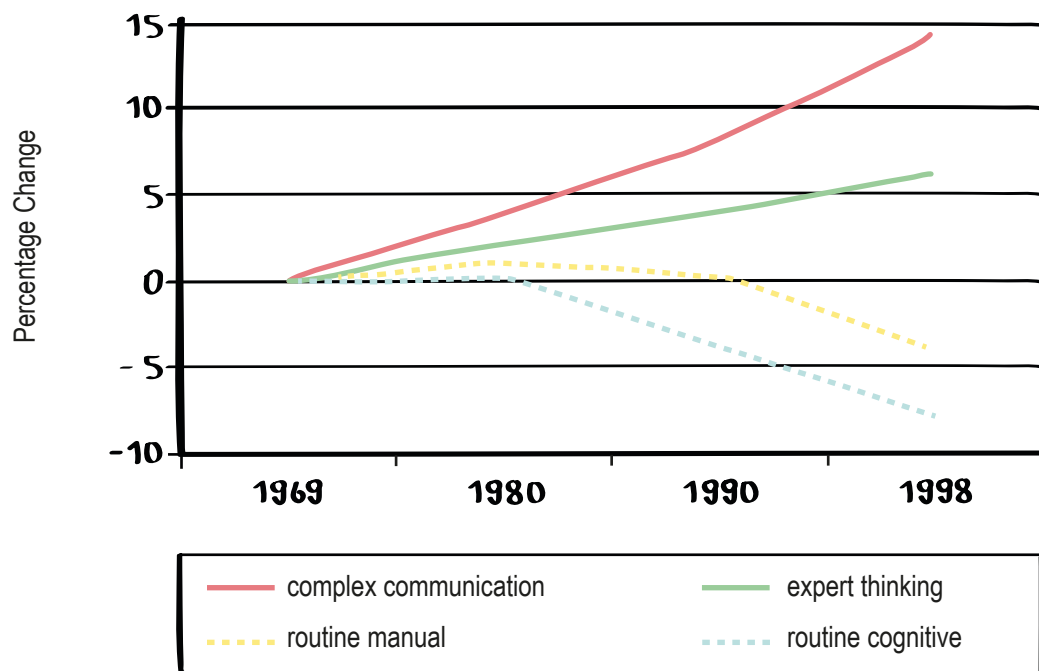
Today's Jobs Require New Skills

Figure 3. New Job Skills (Trilling and Fadel, 2009)
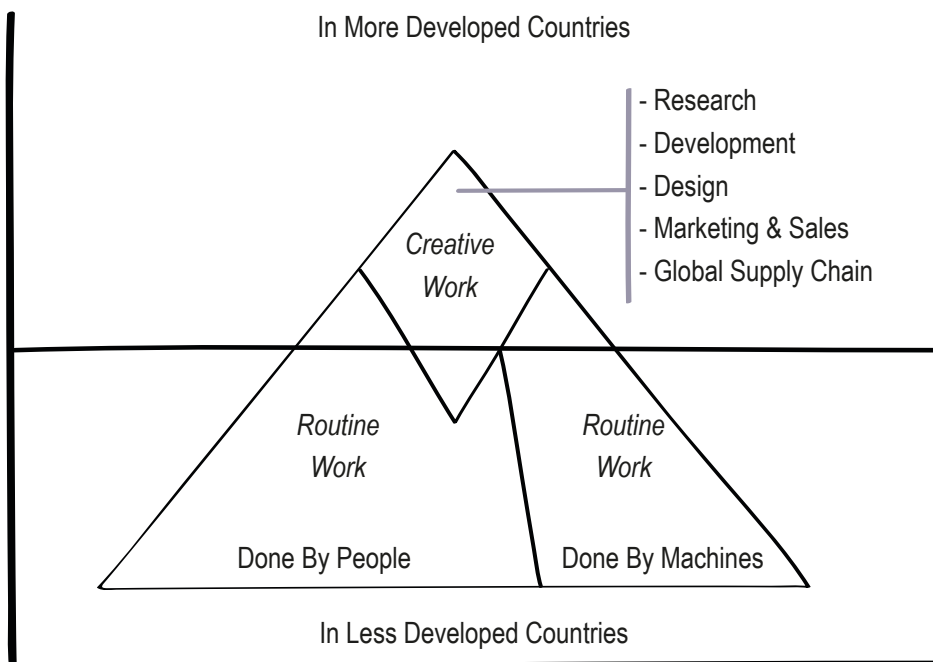

Figure 4. Division of Work in Developed and less developed Countries (Trilling and Fadel, 2009)

role in the fashion industry is currently being defined and shaped, while not knowing what the future holds (The Business of Fashion, 2017). There is a lot of novelty with technology and there will be jobs out there we don't know about yet (Schipper, 2017). According to a 'Future Work Skill Report' published by the University of Phoenix Research Institute a considerate number of studies have been carried out on the prediction of specific job categories and labour requirements but not so successful as the future is hard to predict. It is therefore suggested to focus on developing the skills necessary across different job fields and being flexible when it comes to adapting (Davies, Fidler, and Gorbis, 2011).

To define further what requirements and skills are essential or desired when being part of the new wave of creatives shaping the industry, a number of professionals and educators of the fashion industry have been interviewed (for the full outcome see appendix). The outcome was diverse mentioning various skills as 'technical skills' to 'soft skills' to 'multi-tasking skills'. It can be said that no interviewee was certain about the needs of the future but a majority of the responses highlighted the need for being able to adapt constantly, being open for collaborations and developing design thinking skills that take the whole picture in consideration. More said, being aware of everyones individual impact and making use of technology in ways to improve the system. But most importantly to have the guts to do things differently.

breath of knowledge

depth of expertise
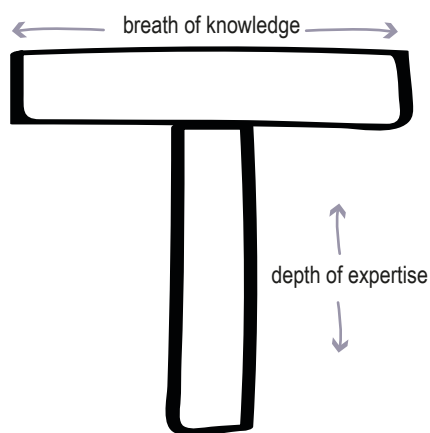
Figure 5. T-shaped Worker (Davies, A., Fidler, D. and Gorbis, M. 2011)

PART III

GENERATION ALPHA

3.I WHO IS GENERATION ALPHA?

Responsible for the term Generation Alpha is Mark McCrindle, futurist, demographer, and generational expert, who labeled those born after 2010, with a possible generation span of 15 years, Generation Alpha (Mccrindle.com.au, 2017). The year 2010, was the same year as the introduction and launch of the first-generation of the iPad alongside 'App' being the word of the year (Williams, 2017). In a statistic it is pointed out that every week, globally 2.5 Million Gen Alphas are born, accounting to almost two billion by 2025 (Bell, 2016). Their generation consists of purely digital natives who are exposed to technology from their early childhood on. According to Bell (Bell, 2016), a majority of the children

start interacting with mobile devices before they turn one. By the time they turn three they already know how to communicate with those accessories without the help of a third-party assistance. Heavy exposure to technology and seeing toddlers outsmarting their parents in the use of digital devices has slowly found common ground and gives a clear indication of how tech savvy this Generation will become. While some people criticize the heavy use of technology, others argue that this is the 'shaping of our future global workforce' (Cmo.com, 2017). Additionally to their natural co-habitation with technology, demographical research shows one-child families on the rise. This results in a more selfish behavior and characteristics of kids who expect immediate gratification and participation in action (Forbes.com, 2017).

3.2 GENERATION ALPHA AS FASHION INFLUENCER

Although the majority of Generation Alpha still is in their diapers or unborn, the influence they have on fashion is astonishing. According to Zutshi, CEO of Fashionbi, 'kids today are much more exposed than ever: to the media, surroundings, celebrity news, kid's influencers on Instagram, etc, that they do demand a say in their styling, as well as desire to dress like their favorite celebrity (Adegeest, 2016). The internet and its endless feeds of celebrity shots and their offspring clearly fueled the demand for a fashionable childhood (Craik, 2015). Hence, if the brands go about satisfying this need, they have a chance to win big' (Adegeest, 2016). More and more brands realize the importance of targeting this generation alongside their Millennial parents. Estelle Lee, editor in chief of parenting magazine Smallish, stated in an article in the Guardian that 'it's not a new phenomenon for women to want their kids to look respectable but the fashion industry has adapted to make children a prime area for growth as our attitudes adapt and society becomes more child-centric (Craik, 2015). Whether it's clothes, parties, after-school activities or education, it is vital for parents to invest in their kids' (Craik, 2015). The accessibility of fashion through social platforms in the past enabled bloggers to influence and guide the industry. It's the time where Millennial are now parents and things that have shaped their lives will be key to making choices for their offsprings (Minicool.net, 2016). Mom blogs have gained strong interest from a brand perspective and therefore, have a big saying on social platforms like Instagram,

Facebook, and Twitter (LeWinter and Pleines, 2017). Their offspring are Fashion Influencers on their platforms having a big saying in the industry shaping. They are already busy with creating their own aesthetic and are until now perhaps the most fashion-conscious generation to date (Fashionunited.com, 2017). This phenomenon of turning anonymous youngsters into fashion icons and important influencers with thousands of followers leads to a generation with a strong voice in the industry (Minicool. net 2016).

3.3 GENERATION ALPHA AND TECHNOLOGY

As the previous literature highlighted the immense impact of digital devices on Generation Alpha, it is questionable what those tools are used for and how exactly they are contributing in shaping this generational shift. When talking about a digital device, it is defined (Yourdictionary. com, 2017) as a physical unit of equipment that contains a computer or microcontroller. Nowadays myriad devices are digital, from a smartphone to a tablet or wearable garment' (Pcmag.com, 2017). Companies such as Google and Snapchat understand that the communication among this generation widely happens via images or voice instead of text. The visual context consumed has to be catching and attractive as the attention span declined (Borreli, 2015). They are technology literate and have a healthy appetite for interacting and consuming new developments (Forbes.Welcome,2017). When combining this eagerness of consumption with a nurturing of narcissism brands realize that participation and co-creation are strong key drivers among this generation. Several kids-centric brands already successfully integrated those kids in their processes. Taking 'Picture this' (Podeszwa and Baron, 2017), where kids can design their own dresses on a paper template, digitize it and let it be printed having the piece sent to the doorstep. Other brands as Toys R Us, take it even a step further by reconsidering job roles, giving kids the opportunity of acquiring a paid testing position, reviewing toys and use a child vloggers influence to gain promotion (Podeszwa and Baron, 2017). They are the most material endowed generation to date and grow up where private and public life, physical and digital world, visual and verbal communication merge and collide (Melissinos and O'Rourke, 2013).

Current research (Podeszwa and Baron, 2017) clearly expresses concerns of this massive exposure as awareness and reality are generated among the parents.

While Millennials and Generation Z still struggle with balancing their online interaction, Generation Alpha is said to be more conscious about their doings (Sprenger,2017). Regarding that, too much technology time is feared to isolate kids and create an antisocial impact. As a result of the realization that digital devices are being faced daily, parents create a halo-effect for toys and apps that help developing STEM skills, entrepreneurial skills and increase connectivity and strengthen social skills (Podeszwa and Baron, 2017). Amazon went on board of this rising demand and dedicated an entire e-commerce section to STEM toys. Nolan Bushnell, engineer, and businessman, founder of Atari, is convinced that 'games and computer technology can bridge the gap between doing things that are fun and doing things that are good for you' (Melissinos, C. and O'Rourke, P.,2013).

PART IV

EDUCATIONAL GAMES

4.I VIDEO GAME INDUSTRY

The video game industry, also known as the interactive entertainment industry, is a relatively young evolving economic sector and traditionally finds its background in arcade games varying from Pong to Space Invader (Snead, 2014). Before the introduction of the home consoles in 1975, video gaming was limited to arcades, from then on the commercial video game market, as we know it now, started to develop (Snead, 2014). The purpose of video games is primarily dedicated to play and entertainment but in recent years gained cross-interest attracting a variety of disciplines (Elsevier Connect, 2017). As Katie Salen, Chief Design and Research Officer, Institute of play realizes, 'games as a form of media will

undoubtedly have taken on a range of new meanings in ten years, but play will always be the engine that drives peoples' engagement. I think we'll see playful systems underlying new designs in human-centered activities like healthcare, communication, and of course, learning' (Essential Facts about the Computer and Video Game Industry, 2016). Nowadays making use of games in other disciplines is seen more frequently and successfully combines creativity with technology. It is said, that new organizational concepts and work skills are not coming anymore from traditional theories but rather from fields like game design, neuroscience and psychology (Davies, A., Fidler, D. and Gorbis, M. 2011). Games can help how people think and behave and therefore attract a variety of unexpected collaborations (Elsevier Connect, 2017). By now, games are not limited anymore to what they used to be. Taking a closer look at social networking, they could be identified as a gamification of real life. Facebook, Instagram, Snapchat, apps society is strongly familiar with requests from the user to choose an avatar, gain followers and be rewarded with likes. We are getting aware of the fact that techniques taken from the game industry are extremely successful and effective in our virtual worlds such as immediate gratification and feedback, that challenges driving participation (Davies, A., Fidler, D. and Gorbis, M. 2011).

4.2 GAMES IN EDUCTAION

It was shown that the demand for developing life-skills among the next generation is rising. In particular, a study (Podeszwa and Baron,2017) revealed that ninety percent of parents are firmly convinced that the ability of STEM skills will be essential in their child's future. Already in 1980, with the emergence of the children's software industry, education related games started being developed and the key is to balance pedagogy and engagement (Forbes.com, 2017). Mechanical Engineering Professor at Masdar Institute of Science and Technology, Abu Al-Rub believes that 'technology is a substantially motivating tool for catching children's imagination and their attention' (Abu Al-Rub, 2017).

4.2.I KIDS LEARNING SHIFT
During the Industrial and Post-Industrial age, it made sense to prepare students in a way that met the workforce demand. Follow procedures and adopting standardized ways of learning to prepare them 'to

deliver' (IFTF, 2015). Nowadays digital natives are used to immediate data analysis and learning by interacting (Minicool.net 2016). Also, prognoses say that Generation Alpha will be the most 'job-fickle generation', having various careers in their life's (Cmo.com, 2017). Information gathering is one mouse click or touch away and undoubtedly influenced the way we used to think and study alongside communication technology that reshapes society (Naughton, 2017). Educational systems in the UK and Finland highlight the importance of adapting the curriculum to teaching kids how to use technology for creation (Saez-Lopez, Román-González and Vázquez-Cano, 2015). Creating an understanding of various devices, how to program and design software's, as well as teaching logical thinking (Saez-Lopez, Román-González and Vázquez-Cano, 2015). According to a study, it was found that students pursuing a non-CS[4] discipline have a very limited understanding of technical devices, and a confrontation in a future work environment can cause frustration and loss of motivation when it comes to having to deal with those concepts. Therefore, establishing a strong base understanding of computers and how they can be used should best be done in the early years of childhood (Shailaja, 2017).

4.2.2 GAMES AND FASHION
According to Chris Melissinos, a leading figure in the Java Community, 'the common thread throughout a majority of games, regardless of their intents, is that they are an amalgam of art disciplines whose sum is typically greater than its parts' (Melissinos and O'Rourke, 2013). When looking at fashion games or games in the fashion industry, there are two main ideas to be found. On the one hand there are 'girly' games giving kids the opportunity to dress a doll or personalize garments and on the other hand gamification of e-commerce engaging the player with promotional offers (Golub, 2017). Both of those ideas are stimulating the consumer and inviting them only to discover and explore the end product of such a complex and versatile fashion system. One collaboration between DKNY and 505 Games called Fashion Week Live, is a social game inviting players to discover careers within the industry

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[4] Computer Science: the science that deals with the theory and methods of processing information in digital computers, the design of computer hardware and software, and the applications of computers.

ranging from show production, photography to styling look books. The main idea is: the more you learn, the more opportunities you can unlock in the industry and rise up (Strugatz, 2017). Matthew Primack, managing director of Fashion Week Live, argues: 'Experience is how much you play. The more you play, the more you learn, the more you learn, the more you can develop your skills' (Strugatz, 2017). Rosi Schipper, a former designer working for Movers & Shakers, states in an interview carried out by Laura Miatkowski that most designers don't know what jobs are out there, and these are old-fashioned jobs. They have no colloquial what skills they would need to be successful because they don't know what they need more (Schipper, 2017). The business is really broad and a lot of opportunities are out there but most people don't know about the diversity (Schipper, 2017).

4.2.3 TOUCHSCREEN DEVICES AND APPS

Maria Montessori, known for her scientific pedagogy, was convinced that 'the hands are the instrument of man's intelligence' (Stowe, 2011). With the popularization of various touch devices through mobile phones and tablets, the connection to a toddler and the device is pretty much straight forward. Psychologist Jerome Bruner links this action to 'enactive representation' (Bruners-stages.wikispaces.com, n.d.). It means classifying objects in the world by making gestures rather than using words or symbols. Concluding, that their hands act as an 'extension of their thoughts'. Before the introduction of touch devices, getting kids familiar with the technology needed, took some time and a more advanced understanding. Making a connection between an action, executed with a mouse and resulting in a movement on a screen, was a barrier for smaller kids to understand technology and to fully interact with it (Rosin, 2017). Now with the development of touch devices and the successful launch of several apps, this problem is not applicable anymore. The preschool/toddler category in the app store is the most popular accounting for seventy-two percent of the top paid apps. As an aftermath, more recent designed apps that promote active, engaged, meaningful and socially interactive learning are considered as educational (Hirsh-Pasek et al., 2015). Those four pillars forming the framework of an educational app are presented in table 2.

Jeffrey and Ovemar, founders of Toca Boca, a game development studio, focuses on child-friendly applications. Once they realized that digital interaction amongst young kids is unavoidable in the 21st century, they decided to focus on how it can compliment a child's growing up process. Their successful launch of a series of apps focusing on simplicity and daily task translated in the virtual world gained major interest amongst the Generation Alpha kids and their Millennial parents (Lange, 2017). Several arguments have been put forward, stating that the jobs kids have been doing in the game resulted in a desire to perform those task in real life (Lange, 2017). Marjolein Sprengler, the founder of Bits& Bots, reported the same behavior among her son 'when building Lego with the app it extended his creativity and engagement level for the blocks in the physical world'. This newly rising field not solely looks at what we should teach kids but as well concerns the content told in order to prepare them by learning them strategies needed to cope flexibly and creatively in a 21st-century world (Hirsh-Pasek et al., 2015). Paul Varga, CEO of Playbrush argues that there are too few woman in technology and they are actively seeking for them as they believe that woman in leading positions and critical situations often show better skills to problem solving (Varga, 2017).

Table 2. 4 Pillars of Educational Apps

4 PILLARS	WHAT	KEY HOW
ACTIVE LEARNING	Physically active and mentally active (minds-on)	- Directly addressing children - Touch the screen (poke/swipe/pinch) - Move the device (shake/tilt) - Wave for the camera - Appropriate level of control
ENGAGEMENT IN THE LEARNING PROCESS	Three types of engagement - Behavioral - Emotional - Cognitive	- Stay on task/ maintain their focus - Eliminate seductive details - Balance between challenging and accessible - Meaningful feedback (motivational messages/ parasocial displays) - Praising children for their effort rather than for their intelligence
MEANINGFUL LEARNING	Sustainable and useful learning comes from experience that connect to our existing knowledge	- Does it tap into the child's personal history? - Does it build a rich narrative? - How does it connect to the child's role in his/her school?
SOCIAL INTERACTION	Social interaction is central to learning: observe and imitate	- Apps are not fully socially interactive and adaptive - Responsivity is limited in apps compared to natural human interaction - Sharing with friends, collaborative games

PART V

CONCLUSION

To put it in a nutshell, the shift of skillset in the 21st century is inevitable and with the rise of technical interaction and collaborations, a demand for Computational Thinking is a good step in the right direction. It is clear, that Generation Alpha hasn't been fully explored yet and it is 'not yet possible to envisage the kinds of morphological and cognitive changes they will experience, but they are predicted to be very positive (Minicool.net 2016).' As we are dealing with a pioneering Generation, concerns about the developments are natural, but the predictions are strongly forward to a tech savvy Generation not to forget Millennial parents pushing towards STEM shaped minds. From an educational standpoint it is becoming clear, that the possibility of using touch-devices can form an immediate extension to our hands. If the four pillars, as described in chapter four, can be taken into consideration

when it comes to developing and designing apps, then the content delivered can be more effectively pushed into a direction that balances education and entertainment. We should not forget, that the game industries' driver is mainly dedicated to entertainment and play. Although in the past years the industry gained importance and acceptance by overlapping with other industries, it should also be appreciated for what it is by itself. The wonderful and magical possibilities that it has to offer and worlds it can create that are dedicated to pure entertainment. The same is applicable to the fashion industry and its traditional craftmanship. It has to be stated that not every girl of Generation Alpha should have to deal with STEM-related tasks in the next decade. Introducing them to new job roles related to technology in various industries, should help to eliminate misconceptions and to gain a broader understanding of the industries activities. In this paper, the fashion industry is used as a motivational driver showing girls that technical skills can be beneficial even in a highly creative industry. To make the outcome of this research paper more understandable and to refer back to my initial question of how to make Computational Thinking activities appealing to young minds with the help of gaming and fashion the following product has been developed (see 'Product-Description' booklet).

Table 3 gives an indication of what field of the fashion industry can be linked to the Computational Thinking Activities to be translated in an interactive environment.

5.1 LIMITATIONS

The 20 weeks of duration from research to end product may have limited the study to observe Generation Alpha over a longer period to get more insight in their natural behavior under natural conditions. As they are a pioneering generation, not being fully discovered yet, consequences and natural givens they are dealing with are yet unknown (Minicool.net 2016). A further limitation concerns the predictions of job roles shifting and skill set essential in the 21st century. Although used sources can be trusted and are verified, the future is hard to predict and changes might always come along. As this research paper focusses on the accessibility to acquire Computational Thinking Skills, it has to be stated that those skills are only one among others skill sets essential in the next decade. The choice of working with CT skills is linked to bring fashion and technology closer together and showing that the gap is not so wide once correlations have been stated. In addition to limitations of this research paper there are some limitations concerning the skills of CT. It requires an understanding of 'that models are only as good as the data feeding them -even the best models are approximations of reality and not reality itself' (Davies, Fidler and Gorbis, 2011). It should therefore be seen as a problem solving skill not always linked to algorithm creation.

Table 3. CT-Skills used in the Fashion Industry

CT-SKILLS	OPERATIONS	FIELD
ALGORITHMIC	Programming Connect/design/make/ repair/renew	E-Commerce Sustainability
DECOMPOSITION	From 2D to 3D design	Design Marketing & Branding
GENERALIZATION	Fabric Constructions	Material Science Buyer
ABSTRACTION	Essence of Information & Communication	Marketing & Retail
EVALUATION	Impact assessment (LCA) Flexible & versatile	Marketing (Blogs/ Customer Satisfaction) Sustainability

PART VI

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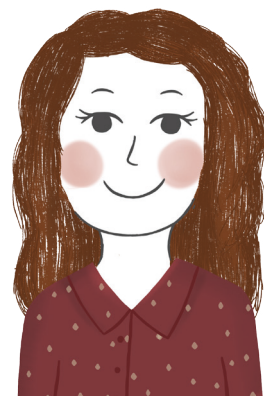
PART VII

APPENDIX

8.I INTERVIEWS

Marjolein Sprenger:
Founder of Bits&Bots | Novastories
Interview in person on 11th of April 2017
Interviewer: Lara-Anna Wagner

What is your professional background and do you have programming experience so far?

I do not have a coding background, I am a filmmaker and back in 2013 I met Ricardo van Loenen , the founder of B. We both didn't exist by then and where working in a free working space in Amsterdam and at that time I recently quit my job as a coordinator at a educational foundation, IMC weekendschool.

What did you do at the educational foundation?

I worked there with kids, aged between ten and thirteen, introducing them in a weekly programs on a variety of mature professions and courses from mathematics, journalism to how to design a website. Those kids would come there every sunday, mostly in socially deprived neighborhoods and would get inspired there so get familiar with more aspiring jobs and broaden their scope on the world. Trying things out in a playful environment. It is now in ten cities emerged and also do pilots in primary schools and refugee programs. There I invited professionals and I as a storyteller thought of what are we going to tell about this professions etc. There is a diploma afterwards and an alumni network, not with grades but about your effort that will be rewarded.

What was your motivation for starting Bits & Bots?

When I got back from my second child maternity Ricardo said to me that he started BSSA, B Startup School Amsterdam, they help graduated people between 18 and 27 who are jobless with a coding bootcamp for free followed by an internship. And he initiated to do something with kids as well and that's where I came in. Combining my storytelling with my experience with kids plus my curiosity for new things. And I really believe in discovering new world and facilitating that. I already knew from back then that the tech didn't get enough attention at school and especially not for girls. And my husband works at 'Youngworks', a communicatiebureau and one of their clients was 'Platform Beta Techniek & Techniek Talent' who wanted more kids into tech and came with this to youngworks asking for how to do that. Therefore, I was introduced to the gap there as well.

What is Bits & Bots?

We have the Vision and the Mission defined yet but don't know exactly how to execute it. Our Mission: Every kid should get in touch with coding, programming or computational thinking. By saying every kid we are really ambitious by that. Right now every kid could get in touch

with it by going online by themselves, express interest in it or at school. But there are not enough schools yet to give attention to programming or computational thinking and it is not obligatory. We want that every kids gets in touch with CT and also more than once.

How?

First we think of an online marketing campaign, in the new terms it is just an online story which goes on and on. I'm thinking of a vlog squad of all these different types of youngsters who vlog, tell or snap about something in tech. I have now one pilot video, one vlogger who likes fashion, is travelling, will do something in business, she is very good at dancing- just a very cool girl. She tries to evolve everything with technique into her daily life or into what sheneeds. Example: she travels to LA and needs a website, so she goes to someone in Groningen to show her to do so and interacting with people from the office revealing more information. Other girls want to follow this vlogger cause she is cool and inspiring. We have a second pillar: Clubhouses, where you can walk in and do something on your computer and leave/stay maybe together with tech workshops. And we are developing together with le wagon a platform for schoolkids and their teachers. Via this platform you can teach people and people teach you, like a shared community giving and getting. With the aim that every kid of the age of twelve can build a website or an app. So with every story there will be tackled a subject of CT.

What do you think is computational thinking about?

Making lot of links with everyday life.

Example: we had to explain signals (sending-receiver model), police car: watch out, but you have to watch out yourself (you receive the signal and decide yourself what you do with it)

Programming at school?

There are several programs already out there but we think it still can be more efficient and smooth, integrated.

IMC Weekendschool: experiment

Last sunday in amsterdam Zuidoost they had programming on their schedule. So I volunteered there. They had to choose from four different categories and so the class was only full of boys unfortunately. The girls have also been interested but because there were classical ballet and fashion also as topic to choose from it fell into stereotype separation. The course was prepared by the professional

with 'The hour of code' material. Making use of scratch programming platform. And you could see a difference in how the younger boys approached things compare to the older ones as they clearly were lacking CT skills, so they need a introduction first.

Kids usually just start without reading too much, fail and error process. Following an exercise is actually also a computational thinking. One way to explain CT is program another person in eating a sandwich. Step by step instruction with the body to reach the sandwich. Put your hand up, put it lower, reach in front...
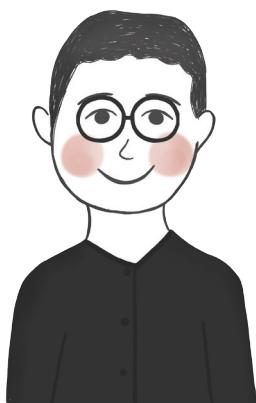
How can you motivate girls?

I think for girls if you promise them a story about fashion and then you secretly tell them all the other things and then you reward their attention with having design their own jacket.

Daniel Seo: *Director of Business Development at CL0 3D*
Interview via Email in April 2016
Interviewer: Lara-Anna Wagner

What is your educational background and finally your motivation working in the fashion technology sector?

My educational background is a bit mixed. I studied Political Science, but after working for a few years, I decided to change careers and went back to school to study Menswear Design. I saw a demo of CLO and was convinced it was the future. Fortunately, this was around the time that CLO Virtual Fashion opened an office in the US.

Lectra is so far a widespread industry standard program. Do you encourage the combination of Clo3D and Lectra or are you more working towards independence?

As there are other global leaders in the 2D CAD space (e.g. Gerber, Optitex) and these respective solutions are used by various brands and vendors, our goal is to support DXF- AAMA and DXF-ASTM, the universal formats recognized by the multiple programs that exist in the market.

Companies that are currently using Clo3D arC:' all mainly working within the clothing sector, are there as well some outside this sector who are interested in the program? (e.g. film/game industry)

Although many garment and soft good accessory companiesare currently using CLO for design development, our beginnings are rooted in the CG, animation, and gaming industries. CLO Virtual Fashion Inc. manages a few major products: CLO Enterprise, CLO Atelier, and Marvelous Designer. Marvelous Designer has become a standard software used in the CG, animation, and gaming industries for character garments. Please refer to their website.

Implementing Clo3D at the design phase reduces the number of physical prototypes needed. How are companies reacting on that (do they still miss the look/feel, are they benefiting from a more precise fit)?

Although every company uses CLO differently, the main reason they decide to adopt the software is to visualize their designs and to make any changes to details and silhouette befor,e they decide to create a physical sample. The 3D sample is never meant to replace the physical prototype. It is meant to be a visual checkpoint in between design and sample development to reduce the number of sample rounds. In terms of fit, although we have tools that help you understand the fit of the 3D Garment, Avatar techn_ology requires further development for 3D to be used for fit as the Avatar is a hard object. Human beings are soft - muscle deformation in movement, fat, and subtle skin movements are not accounted for with the current state of Avatar technology. This is not a limitation of our technology, but of Avatar technology as a whole.

New job positions are developed specifically making use of the program, could you give

one example to elaborate on that?

Every company adopts CLO differently - the end user could be the Patternmaker, Modelist, or the Designer. However, some companies do create a separate position for 3D, referred to as a 3D Modelist or 3D Designer. Their main respo_nsibility is to construct the 3D Garment based on the 2D Pattern.

Do you feel computer science (STEM- knowledge/ education) is of primary importance in any future job profile?

There is a definite need for early introduction of STEM-related studies within primary education. Technology is becoming an ever-increasing component of our daily lives and the nèed for innovators within this space is growing.

In production, you generally send a prototype and a stylesheet. Would it be an option for CL0 3D to develop a function in the program that immediately translates the design into a style sheet (fabric consumption, trimmings, f inishings)?

This is something we are currently looking into. Although our primary focus is on the design phase, additional functions will be developed that can be applied to the production phase of the garment lifecycle.

How do you experience reactions of possible consumers on the 3D visualisation of the garments? Do you think they feel confident enough to buy this clothing by seeing a visualization of it instead of an actual image/ photography?

One of our clients, Imperial Fashion is currently undergoing this process via their Facebook page. They have been collecting feedback on 3D Garments, bringing their consumers into the design development process.

Overall, the 3D Garment is a great way to get feedback and immediate responses from consumers for design, but it has yet to prove itself as the only means to convince a consumer to buy.

Paul Varga:
CEO at Playbrush
Interview via Email on 20th of April 2017
Interviewer: Lara-Anna Wagner
* Interview was conducted in German

Woher stammt die Ursprungsidee? (z.B. persönliches Interesse/Marktlücke…)
// Where did the initial idea come from?

Kam eigentlich über mein Taufkind - hab mitbekommen, dass er (wie die meisten Kids) nicht gerne Zähneputzt und seine Mutter ihn mit dem iPad incentiviert. Sie hat ihm immer so kurze Zahnputz-Clips auf Youtube gezeigt, die er cool fand. Statt jedoch Zähne zu putzen hat er einfach nur die Videos geschaut und die Zahnbürste nicht bewegt. So bin ich auf die Idee gekommen. Danach hab ich mit ganz vielen Zahnärzten und Familien darüber geredet wie groß das Problem ist, und bin drauf gekommen, dass man hier echt was machen kann.

// It started with my baptism child. I have noticed that he (like most kids) does not like to brush his teeth and his mother constantly tried to motivate him with the iPad. She has always shown him short tooth-brushing clips on Youtube, which he found very cool. Instead of brushing his teeth tho, he just looked at the videos and did not move the toothbrush at all. So I came up with the idea. Afterward, I have talked with quite a lot of dentists and families about how big the problem is, and that there is a huge potential to really do something in this area.

Warum habt Ihr Euch dazu entschieden für die Umsetzung mit Apps zu arbeiten? *// Why did you decide to make use of mobile phones/ apps?*

Weil es der natürlichste Weg ist heutzutage Kinder zu beeinflussen. Jedes Kind kann mittlerweile ein Smartphone bedienen und versteht Apps. Während Fernsehen, etc alles zurück geht, ist der Gebrauch von Apps und Smartphones unter Kindern mittlerweile

normal, dementsprechend das ideale Medium.
// Because it is the most natural way to influence children these days. Every child can now use a smartphone and understand apps. While television, etc. everything goes back, the use of apps and smartphones among children is now the norm, therefore the ideal medium to work with.

Was ist die durchschnittliche Altersgruppe und welches Geschlecht begeistert sich für das Produkt?
// What is the average age group using the app and how is the gender division?
Wir haben Spiele für jüngere Kinder (3-6) und ältere (7-11), es spielen sowohl Buben und Mädels (wir erheben die Daten nicht).
// We have games for younger children (3-6) and older (7-11), both boys and girls (we do not collect the data)

Das diverse Spielangebot für Playbrush dient derzeit der reinen Unterhaltung. War schon mal die Überlegung auch pädagogische Aspekte einzubauen zusätzlich zu dem Lernaspekt des Zähneputzens? (z.B. educational games) *// Did you ever consider working with educational apps in addition to the one's serving as entertainment and motivation to brush longer?*
Ja gab es auf jeden Fall, wobei wir momentan uns darauf fokussieren indirekt edukativ zu sein, dh. die Kinder via Spielen zum regelmäßigen Zähneputzen für 2 min 2 mal am Tag zu begeistern, und das sie überall im Mund putzen. Die Regelmäßigkeit und Dauer sind nämlich größere Probleme als die Technik. Darüber hinaus gibt es 7 verschiedene Techniken und unter Zahnärzten scheiden sich die Geister welche die Richtige ist.
// Yes, there was definitely! But currently, we are focusing on being indirectly educational. We concentrate on the children through games to achieve a regularity in brushing their teeth (2 min 2 times a day) and to ensure that they clean all sections within their mouth. At the moment achieving a consistency and duration of brushing is more of a problem than the actual technique. In addition, there are seven different techniques, and even among dentists, there are divided opinions according which one is the most effective.

In welcher Programmiersprache werden die Apps zum größten Teil entwickelt?
// What languages are the games developed in?
C# über den Game Engine Unity. Die Playbrush Firmware in C und C#, das Backend Großteils in Python.
// C # on the Game Engine Unity. The Playbrush firmware in C and C #, the backend bulk in Python.

In einer jungen und dynamischen Firma wie Playbrush, wie ist die prozentuelle Aufteilung der Arbeitsplätze zwischen Männer und Frauen und in welchen Bereichen finden sich mehr Frauen wieder? (z.B. Design, Entwicklung, PR…)
// How is the percentage division within the company between male and female employees?
Viele zu wenige in der Technologie (suchen aktiv nach Frauen). Wir haben momentan 5 Mädels (von 15 Leuten), davon eine Produktmanagerin, eine Grafikdesignerin die auch bissl Front-end macht, 2x Marketing plus einen Intern (auch Marketing).
// Too few in technology (we are actively seeking women). We currently have five girls (of 15 people), a product manager, a graphic designer who also does a bit of front-end, 2x marketing plus an intern (also marketing).

Seht Ihr ein Bedürfnis mehr Frauen für die technische Welt zu begeistern?
// Do you see an urge to motivate more females going into tech?
Auf jeden jeden Fall - prinzipiell suchen wir Frauen, und denken auch dass in Führungspositionen und bei schwierigen Situationen Frauen oft besser agieren.
// Definitely! - In principle, we are looking for women and also believe that woman in leading positions and critical situations often show better skills to problem solving.

Welche besonderen Fähigkeiten würdet Ihr bei einem Angestellten in der nahen Zukunft suchen?
// What special skills are you looking for in a future employee?
Vor allem Technologie-seitig: Backend Developer, Unity Developer, Front-End Developer (fuer unseren Webshop) und Data Analysts. Eventuell jemanden für eCommerce.
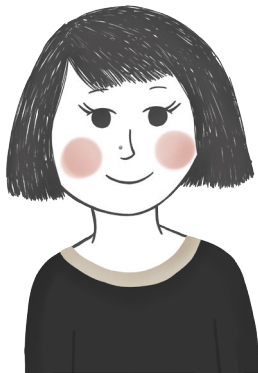*// Mainly on the technology side: Backend Developer, Unity Developer, Front-End Developer (for our webshop) and Data Analysts. Maybe someone for eCommerce.*

Orfhlaith Tiffney:
Digital Strategist at Nike
Phone Interview on 21st of April 2017
Interviewer: Lara-Anna Wagner

What are some of your main tasks as a Digital Brand Specialist?

Basically I work mostly as a wholesale digital brand specialist so I work for Zalando and what I do is bring all the nike categories to live across the zalando channels.

So what are categories?

Nike Sportswear, Nike running, Nike Training, NIke football, young athletes and Nike Women. So all of their brand priority stories that they have how to bring that to live across wholesale .com channels for Zalando that is on their website, in their editorials across their media campaigns. There is a Nike only destination on Zalando so I am in charge of that.

So what is the Zalando tick on the Nike App brand?

Let's take an example. A running shoe the VaporMax show which was the newest technology shoe and it came out on the 26th of March for AirMax day and basically the whole thing I would do for this is I'd go to meetings a month in advance, we are working with the Nike running team themselves to see what are their brand plans and what does that mean for wholesale. Then we will get like images through from global and then I will see like what visibility we have with Zalando to play this stories. So if it's on the website, if there is a dedicated media campaign. If it will be featured on the Nike owned brand shop. If there will be like an editorial story about it and then I will come up with copywriting, what are the best images, what color ways are we gonna show, are we gonna show it with other items, are we gonna do our own influencer marketing campaign. Then I would like work to find right influencer, come up with a shooting concept, get the whole team together, execute that with the post-production agency to get all that done and then hand it over to Zalando. People will implement it. If it's on the Nike owned brand shop then I'll work with the agency to make the correct images for it along with copy. Then I'll come up with the linking strategy behind that creatives. So if you click on the image which will be the next page you land on. Is it gonna be like straight to the product detail page or will you go to a page with a lot of different images because perhaps you want to create a 'halo effect' on the other items in the assortment so you also want to push maybe some of those items as well, there are more clicks to buy in that case. Which can be bad for sell through or as strong as if you would go straight to the product detail page. So you have to try and work out what you want to do with this creative. Do you want to promote the brand, promote the category or the style. And then with the brand shop there is a lot of data we get back from Zalando about it so I will sit and go through those and analyze it and try to understand which creative has performed best and why or what to do and don't and what to feature. If we do a media campaign with Zalando, they also report back with a lot of data so I will also sit and go through those and see what was good and what was bad and then whenever the whole thing has been executed I will then create recaps to send out to everyone in the wider Nike-Team. Apart from that I also work with all the functions, so that would be like the merchandisers, the sales guys, managers to make sure that the launch all goes according to plan, that all the shoes are in the warehouse. Also when I work with the sales guys they might have a lot of volume of a specific product that isn't a brand focus so I'll come up with short term strategies to get it to sell. Also going to future strategy meetings to see what is coming up and what we should do or implement and things like this.

I assume you work in an interdisciplinary team at Nike, what are some technical related tasks you came across?

I don't really have to do anything that technical. I just need to prepare all the creative aspects and then I hand it over to someone as a tech producer or an ops manager who will then have his dedicated team who will implement it as a backend in the website. The only things technical, I don't even know if you can call it technical, is looking at order books. That are massive excel sheets to see what we have.

Rens Tap:
MODINT Business Development
Phone Interview on 10st of April 2017
Interviewer: Laura Miatkowski
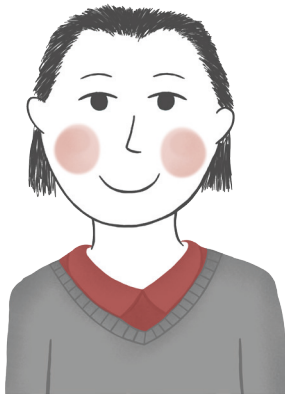
First of all, how would you describe the current zeitgeist of the fashion industry?
The time of creativity is over. As a young designer you can still dream and imagine about an own brand, but the time of own brands has passed. That is a thing of the past now. The current fashion industry is evolved around new developments. Today, big data, wearable technology, new materials or sustainability have become a bigger focus of fashion. And exactly these developments are shaping the industry.

Furthermore, how will the zeitgeist develop in the future?
Young creatives should consider how to use their creativity. They should not focus on the old ways of designing, considering only colours, textures and trends. They have to use their talent in solving bigger problems, such as sustainability, or how technology can be integrated in fashion. These are things for the future. Generally, they need to have a view of the bigger picture or problems of society, considering not only the environment but also the wishes of the consumers.

(Recommendation of the book "Strategic design – eight essential practices every strategic designer must master" by Giulia Calabretta and Gerda Gemser (TU Delft))

In regard to the Dutch fashion industry, what are its main characteristics?
First of all, the Dutch fashion industry is quite small. It does have a big international trading history, so global trading is of high relevance for the Netherlands, but unfortunately that is not enough anymore. This is due to increasing competition. The country forgot about thinking of the whole production circle, so also considering technical skills. Technical knowledge however is decreasing. There seems to be an interest by young people, but the actual skill is lacking. Therefore, the Netherlands needs to reinvent, and the core solution is creativity.

What are the strengths of the Dutch fashion industry?
Mainly, the Dutch industry thinks in the category of fashion design, not art. The industry can be described as flexible, which is open to new and different influences from outside. That is what makes the country unique in this perspective.

Looking at the people involved in this industry, what qualifications are required in order to be successful?
Today, designers have to work very commercially and fast. This can be an obstacle, as they are people who love art. But nowadays, we have to differentiate between designers who create very artistic pieces, which is great and they should, but then they are not part of the fashion business. They are rather ascribed to the art industry. The demand in the fashion business is for stylists, which are the majority of designers. They think in a more commercial way.

In your opinion, what are tools or qualities are often overlooked?
Designers who really can think differently, out of the box. Designers, who are not being so partisan in designing, but who are really doing their own things. Examples are designers like Iris van Herpen or Pauline van Dongen. They both experiment with different production methods, they design for different industries and they are very open-minded and innovative. This is what is needed.

Does this need to be more enhanced in education?
Yes, defiantly. Young designers can not be the next Yamamotos, That must be made clear by the institutes. Furthermore, teaching business skills is also not necessarily the solution, as the new designers will mostly not have their own brands. Schools need to rather acknowledge issues such sustainability or technology.

Modint's environment is described as being collaborative, being involved in co-creation. Fashion however is often educated to young designers as very individualistic, teaching students to follow their own

vision and working always on their own. How do you see this paradox, and how important is collaboration in fashion after all?

In my opinion collaboration is not a solution. I would advise to not collaborate, unless there is an evident win-win situation. When you are small and independent it is easy to collaborate, but the more you have and the more you grow, it becomes harder. When talking about collaboration, then trying to get into new fields of design, that is advisable. So for example, working with other, outside fashion, industries and learning from each other, learning their techniques. This way of collaboration is needed and is the future, but not collaboration between two fashion brands.

Rosi Schipper:
Movers & Shakers Recruitment Consultant Design
Interview on 10st of April 2017
Interviewer: Laura Miatkowski
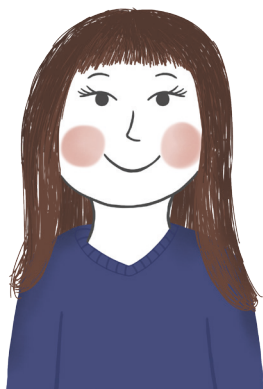
How would you describe the current Zeitgeist of the industry?

Getting more positive. Yes, I think it is not easy, yet, but we come from a more difficult period. I see a lot of movement, so that is on the commercial side. I think people are getting more positive, more companies which are doing well, so I think that's a good thing. And you also have on the other side, new jobs being created for the future. And with all the companies who know they need to be more sustainable, or at least busy with it, it is going to be an industry on its own as well, because there is

not so much knowledge yet. This will maybe create new jobs as well. Because every designer I speak, wants to work for a sustainable company, and I worked with quite some companies which are thinking about it, but know how difficult it sometimes is. It's a general thing that it is moving slowly towards it. There is a lot of newness, with technology in fashion. I sometimes think there will be jobs out there that we don't know about yet. That is interesting, also scary for some people. If you have been really successful in the last ten or twenty years, the rules are changing, the consumers are changing, they are being informed in a different way, everyone is trying really hard to grasp groups of consumers, how do you work with them, and some companies are really successful, and some keep on sticking to their old ways, they find it quite hard.

How do you think will it develop further?

So will it be more about sustainability, technology and all of that?

Yes, that's right. That is what I believe.

And in regard to the Dutch fashion industry, what do you think are the main characteristics?

I think the denim side of the business, of course with all the developments here, with the Denim School, the Kingpins and interesting denim brands, with G-star at the forefront. I think that's a good Dutch thing. As well, what you see, because a lot of companies are falling down, they left, that is maybe because it's supposed to be like this. Because if you don't move or change… I think now in the market you see a lot of interesting start-ups, also on the sustainability side, brand like People's Avenue, pretty small brands trying to do that in a different way. I think there is a lot of that going on in the market.

And what do you think mentality-wise of the industry in the Netherlands?

What I always hear, Dutch people are always sort of realistic. There is a lot of innovation. If you look a bit broader than fashion, the Design Academy in Eindhoven and ArtEZ, a lot of new things are happening. So I think innovation, but mixed with a sober and realistic view on how to do things. And what I also hear, I mean I speak to a lot of international candidates, the balance which we have here between life and work seems to be working well. Something that the Dutch do okay. I don't believe in working everyday from 9 until 11, that's not efficient. People have to have a better balance, because then they

will be more efficient. That is something that could be a pro-Dutch thing.

Looking at the people involved in the industry, what are the qualifications that are required in order to be successful?

Well, talent of course. But that's actually a small part. I think perseverance, working together, being open-minded, being able to think outside the box, being able to take critics and work with it. If you look at a profile of someone and you look at who is successful; yes of course you need talent. But if you are really talented and you can't work with other people or you are not open for critics or you can not move from left to right in a certain way, then your talent is wasted. Then you are sitting on a couch with all of your talent. So you have to have much more than just your talent.

And when talk about working together, do you also mean collaborating with others or do you mean just the spirit of being able to work with others?

I think both. But I really enjoy seeing cross-overs, as technology people working together with designers or really creative buyers working with designers. It's sort of mixing the strengths and different skills, and I think that will bring innovation.

But also from other industries?

Yes, specifically from other industries. Then you can create innovation.

Is there something you think is missing in young creative, qualification or tools that are still not there?

Depending on the university or school they are attending. I think AMFI is doing pretty well, but still, I have been to ArtEZ in Arnhem. I finished school and then in the end I thought the commercial business was very nice, but that was just because of my character. I enjoyed it and was afraid to tell my teachers that I really liked that commercial side of the business, because that was sort of a dirty word, but that's like 25 years ago. Starting this business, what I am doing now, recruiting people, talking to a lot of people, I was expecting that to be changed. Well, that's not the case. Not in all instances, sometimes it is good to nature, to let your talent grow, but if you have no clue of what is going to happen when you are outside, something is going really wrong. I find that sometimes frustrating.

I see that, maybe AMFI not that much, because they

portray themselves as being a more commercial school, but Rietveld for example is seeing fashion as art, pushing your own vision.

And that's good. Really, that's really good. But, if you go out there and then suddenly you need different skills than only being your talented artistic self, you need much more, then sometimes they fail. It's such a pity. They should have been helped in an earlier stage. So it is not perfect yet.

So what do you think has to be enhanced more in education in these kinds of schools?

They [designers] have no clue - and I am not speaking generally - what sort of jobs are out there. And these are just old-fashioned jobs. They have no clue in what skills they would need to be successful, because they don't know that they need more. So I was just surprised, I didn't expect it now. I thought by now students will be prepared for what's coming, but if you have no idea… Of course it is really nice to be creative, but in the end, if you want to have a house, you need to eat, and you need sort of a balance in your life. And what I also find kind of scary is when they go on and they are around forty and the market becomes more difficult. Because you get sort of old. Then they have to change in time in order to move in a different direction. Maybe if you are twenty, you don't want to hear this, but on the other hand, it is good to let people know what beautiful possibilities there are but also about the difficulties you can expect.

Fashion has this kind of celebrity and fame to it. That is why people want to be in this industry. They see how it can be, but they don't get the whole picture. So I think sometimes the schools tell you to be the next Yamamoto, but that is not how the industry works anymore.

No, and honestly not everybody is the new Yamamoto. In our business now, we have this really simple assessment when we talk to people, and after this assessment – and I would do that assessment when they are 15 or 16 – sometimes you see this one doesn't need to be the new Yamamoto because he is really good at this and this. The business is so broad, so many different things to do which are really interesting, but people don't know about. Sometimes there is such a pressure of starting your own brand, and I really believe and love that people are busy with shape and silhouettes or colours, but still, I want them to be able to live. I think in the beginning it's not so bad, but if they are start over their 30s, then it's not so

funny anymore.

You have a lot to do with young creative people in the industry; do you think the job market is difficult?
It is not easy. If you just come out of school, you need to get a chance. For instance, I am working for this recruitment agency, we usually only see people when they have like four to five years work experience. That's nonsense actually. It is really difficult if you have no expertise what so ever yet, it is really difficult that they get a chance. But on the other hand, if you have nice internships, if you speak to a lot of people, that creates the opportunity to get that chance. You just need to start.

And what are the main opportunities for designers in the Netherlands?
If someone starts in the beginning, so he is not expensive, you have a lot of start-up companies which are doing really interesting things, where you can learn a lot. In a small company you can see and learn how it goes. The only thing is, if you move to a bigger company, you get to see the processes, the organisation, but I do think starting up in a smaller company is hopefully growing in a positive momentum, that's a good place. And I think you have quite some of those. Or go abroad, don't stay here. Just invest a couple of years outside. This [Holland] is really a small and tiny country, and the business is really small, so I would say go. Because in other countries you sometimes have better opportunities. It's sometimes difficult to get those Dutchies out of the country.

Are they very attached to their home country?
Yes, they like it here. Which I understand, but it's sometimes very difficult.

What are companies asking for, what kind of person do they want to hire?
They always have this ideal person in their head, which I get. Of course, creative, but with a commercial eye, teamplayer - it sounds a bit corny – and eagerness to learn. Some students they start and they think they know everything. They are bit arrogant-ish, but they actually don't know a lot. But they think so. Let that go. Be a bit modest, and then learn and then be better than your manager. I don't understand how it can be difficult to find someone, but companies really have difficulties. You have to fit in a team, that's the most important thing.

That's especially a point where I see a problem.

Everyone is saying you have to be a team player, you have to be able to communicate, but I see as well how AMFI even educates the designers, they never work in groups, they always work in their own bubble.
But that is really bad.

So I think in my course, in management, we work in groups from the second semester on. In the beginning it's difficult, but once you kind of get into that, its fine. But designers don't even like to choose a course where they know they have to work in a group. Which I think is funny, because in real life, you will have to.
It's true. If you get out there, you will notice that making compromises… you have to. You are in situations where it seams like the one who shouts the most, and that is usually the manager or the owner, gets what he wants. We are not doing mathematics. It's all quite emotional. You really have to be able to communicate and make people enthusiastic about your ideas, so you can bring them in and grow together. I think that is really important.

Now we also already talked about that they need more commercial skills, but do you also think they need more business skills? Or should that still be a different part of the industry?
I think it would be good. It would be great if they could see through the processes. Because sometimes, when you start and you are in a small company which is growing organically, and then it grows and it grows, it becomes bigger and it needs structure and organisation, it would be good if you would have knowledge about those things. But I don't know if everybody is open to it.

There is also a lot of discourse about technical skills, that they get less and less. Do companies want to have someone with good technical skills or is that also getting less?
No, I think it's really important, also. Maybe it depends on that sort of part of the direction you choose, because you can't learn everything. But I do think there is a lack of real knowledge – I sound so negative, but that's not what I mean – but that's what you hear from companies. For instance I have companies where a lot of young people work. They are not expensive. But then they notice that there is also an immense lack of knowledge and technical knowledge as well. But there is such a broad spectrum that that sort of specialism should be more there when you choose your focus. If that is something that you love, you have to make sure that you know the technical

aspects. So yes, it's lacking. It feels almost like they have to after they graduate specialise in a certain direction.

It seems always like they learn the skills at internships, during a practical time, not at school. I do understand that schools can't teach everything you need, but there should be a balance.

But then, if the students feel like this as well, and they tell it to the school, what does the school reply? Can they not look at the balance?

Yes, I mean in the end, fashion creation comes from a craft. It is a funny paradox.

I think also with sustainability becoming such a strong important part of our future, there is technology to learn. A friend who studies at the Waag, Fablab, they did this really nice course with dying with natural ingredients, but also with minerals. It is really specific, but it gives you in-depth knowledge, how to be in that part of the business. Would be interesting as an educational system how you can help them better that they don't have to take a gap year and take it somewhere else.

Do you think the Netherlands is doing a good job when it comes to sustainability?

It is still on a very small scale, so I think there are a lot of little things happening in a lot of small areas, and also big companies like G-start are looking… so yes, I think they are in the forefront, but it still is going too slow. I think in Holland we are really aware of it. If you look at food, it's such a big thing, as we are eating biologically, eating local and I think this is spreading into creating sustainable buildings, fashion… so yes, we are making a good start.

I don't know how far it is in design, but in the management course we are always pushed to think in a sustainable point of view. Designers don't seem to have that kind of understanding.

That's funny, as every designer I speak to, and they have some years experience, they are all telling they want to work in a company which is working with sustainability. So maybe it comes a bit later.

I'm still at the start of my professional career, I'm vey curious how it will evolve in the future.

I do think you are in an interesting phase, the world is changing and I think that is also scary for a lot of people. How will people buy things? How will retail move? How will online move? How will it work on the actual product? It's such an interesting momentum

I guess flexibility will also become more important.

Yes. But people are restricted because they are scared. I was a design manager for a very long time, so I hired my own people, now I'm helping others. People are scared of thinking outside the box, they want this formula for positive results. But you need to try and see and let it grow. People want to cover their asses and be as secure as possible. But if you stick to that, you will loose. But that is for some companies very difficult. This business is very hard. People work a lot, get burned out. The amount of burned out people I talked to is unbelievable. That pressure is really high. I can imagine at a certain time you might think you hate that business, nasty business. You have to find a positive way into the business. But I do think the world is changing, in a positive way. If I see the younger generation, what is see I think is very positive. Your are better. You are better informed, you better know your way.

Francina van den Berg :
Fashion Solution Commercial Director and founder
Interview on 13th of April 2017
Interviewer: Laura Miatkowski
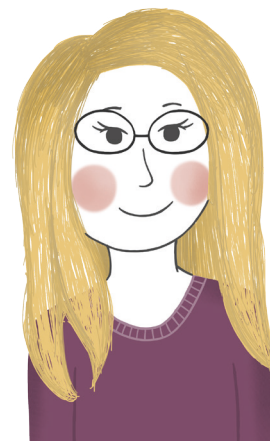
How would you describe the current zeitgeist of the industry?

So, there is change and change and change. A lot of

change. I think this is the most important thing. A lot of things will go by the computer or automatic, I think that is a big change. But design and creativity is the most important thing in the world, I think that will not change. We don't have to be afraid for that, but it will be in another way. Designers can use the computer and the automatization better or in another way.

So technology is basically the main force that is changing and driving the industry?
Yes, exactly.

And this will also be something that will be developed further?
Yes, I think so. We just begin.

Your company is focused on the Dutch fashion industry. What are the main characteristics of the Dutch fashion industry?
I think that Dutch fashion is very casual; it's wearable, a lot of jeans and denim and must be worn very easy. That is the most important thing for Dutch brands. But we see a lot of foreign brands here in the Netherlands as well. But if it's about the Dutch then it is also about fun.

So the Netherlands is a more commercial country when it comes to fashion?
Yes. It is very "nuchter" (level-headed, pedestrian). It's always very commercial.

Working for different industries, the mentality plays an important role. So how would you describe the Dutch mentality?
The same. We are vey commercial. A lot of Dutch people are working in foreign countries, because we are very flexible in what we can do. We can adapt to the environment very easily, we speak reasonable English, a lot of young people fluently, I think that is very important. We like to try. We have still this 17th century mentality, we like to bargain and like to buy.

But are there also weaknesses that you think the Netherlands still has to improve?
Maybe, we are very straightforward. It is a strength but also a weakness. So if you are a buyer or a designer, a lot of people can be straightforward. But in some countries and different cultures it might not be so nice to be so straightforward. This is the most important thing. That is typical Dutch.

In your eyes, what qualifications as a fashion designer a required in order to be successful?
I think you have to be very good on the computer. But you also have to be very good by hand as well. Because I think the creativity by hand is very authentic, but if you put it into the computer and make some other things with it. I think the authentic thing is very important, everybody was authentic, then they did it on the computer and everything was very nice, and now it is a mix. That is very important to have as a designer. I think it is very important to have your own vision, your own mission and go for passion. I think for everybody that is very important, but for creative people, for designers it is more important than ever. You have to have your own vision, your own words, your own line and your own thinking. I think you will be working in a very very big company and then the rules are there and the handwriting of the collection is there, so you have to do what they do, then we call you a stylist. If you are working with a brand, there will be very small brands, there will be very small companies with 7 or 8 or 10 people, that is the max, and then you have to be very authentic. Then we call you a designer.

Does this mean that you have to specialize in what direction you want to go?
I don't think you have to specialise. I think it is in your blood. When I did the Montaigne, the old AMFI, I was very very very commercial and then we were told to be designers. But I was a stylist. I am very good in styling and not very good in designing, because I am not authentic. I know what the people want for some brands and then I made the collection for the people, and then I did the concept for the people. I am not very authentic as a designer, because for me it doesn't matter if there are two pockets or three pockets, I want that the collection will be sold. It is a different kind of thinking.

So you have to know what the consumer wants and you need to know your market more than these authentic designers as a stylist?
I think here (stylists) they spend more money and the collection will be a lot of times very cheap. Like H&M, Primark, and all kinds of brands that are there. If we go to the smaller brands and the more authentic brands, this will be much more sustainable or special taste of the collection or specialised in prints or denim. So it is more specialised. It was in my blood that I was very commercial, so I very good in this and I didn't want to be a designer, so this is already in your DNA.

If we talk about having knowledge about the market, do you think this is missing in young designers?

They totally don't have the knowledge from school. But when I came from school in 1995, I didn't have this knowledge as well. So there is no difference to 20 years ago. When you go work, then you finally get your experience. You don't get your experience at school, at school you experiment with the collections, so I think that is very good. So if you want to have more experience from school, you have this Masterclass as AMFI now, I think it is very good at the AMFI that you are not too serious with your collection and that you are experimenting with your tools. You have to learn how to be creative and how to make a collection. So it is very important that you can do everything, instead of being too commercial.

So you think that schools don't have to necessarily enhance more marketing or consumer behaviour classes?

There is your internship for. The school has to be experimental.

But is there still something that you think needs to be improved in education?

I think for the AMFI, it needs to be more done with online business. There must be an improvement with the e-commerce. If you have a look specially for design, I find it very difficult to specify because if you are this very authentic designer then you have to be your authentic designer, you make our own clothes for your taste and you will get fans around you, but it can be a very small group or it can be a bigger group. But that is your choice. So that is not very interesting for the e-commerce, so it is very good for the designer to learn to work more with people from web shops or to know how your collection is shown on the website, that you know something about that. But it is also important that the designer knows how you can buy that collection. If they have more knowledge of buying and production, I think it is also very important. So you are not only a designer. You have to be broader and know everything. You don't have to be the specialist, but you have to have the knowledge about all those small things.

Do you think this also has to do with collaboration, in the sense that you have to be able to work with people?

Totally. I think one plus one is a hundred, and not two.

How I see it at AMFI for example, designers are working very individually; they are never really paired up in groups, so I think they are very much enhancing themselves. But if they come to the industry that changes.

You have to collaborate with everybody. So if that is missing at the AMFI, then this is very important. You can not make a collection on your own, you have to make a collection with a group of people. And also in the business.

When talking about sustainability, do you think that this is something that will become bigger? Or is its, as you said before, more for the authentic brands?

No, that will go to 100%. Everything, and in every textile and in every design in every finish. Everything will be sustainable.

How would you describe the process of today in the Netherlands, when it comes to sustainability?

I think we are sustainable for 5%, not that much. People are becoming more aware of it, this is also a trend. It was very small a few years ago and then it became fashionable to be sustainable. Now, we are a bigger group of people that is more normal to be sustainable, to eat sustainable or to do something sustainable, so it will grow and grow. Because the awareness of the people will grow. So it will be normal.

So it also means that the industry has to change their way of working.

Yes, but they are busy with it. In 5 years, we will be on 80 or 90 or 100%, because also the law is pushing it to the limits. For a lot of people, they do it for the money, but already the laws for sustainability are providing nicer and cleaner clothes. I think we will be making big steps.

Talking about the Dutch job market, how is the situation for young designers once they have graduated? Is it easy?

Sometimes it's easy, sometimes it is not that easy. It depends on the designer itself. If you have a very good internship, then you can find a job within 2 or 3 months. If you are not having a good internship and you didn't do a lot of experience, then it will take longer.

So it is basically up to the individual what they are doing during their studies in order to prepare for the professional world?

But also how your presentations look like. What do you tell the company about yourself? Who are you? What can you do? I told your colleague yesterday already, that you are not very good prepared in doing your interviews and also not very good prepared in doing your presentations. So you need to learn there.

In regard to my research I found stances saying that the UK is dealing with an oversupply of undereducated design graduates. Do we have this situation in the Netherlands?
No, not yet.

So the job market is not difficult for the designers because there are jobs?
So it depends on the individual. It sometimes is difficult, because they are not pro-active at presentations. And when you are not pro-active in your presentations, and in your interviews, and in your motivation letters for job interviews, then you will have a problem. I think a lot of young people are a little bit lazy in doing things they have to do to get a job. That makes the problem. When you have a good internship and you pro-actively do your motivation and CV and your presentation skills are trained, then I think you will have no problem. That is the thing I want to tell the students, 'go and train your presentation skills'. Because if it is about yourself, it is sometimes frightening to tell what your skills are, you are afraid to tell who you are.

So it could also be pushed more by the schools then.
Can be. I gave training at the AMFI for making your CV and motivation letter and also presentation skills. Three recruitment agencies were invited to give those classes. And I went to all my invitations. I had three appointments. You are with 200 people that graduate or something like that, and there came two on my presentations. So when out of 200, two come to my presentation, you can imagine that this is not that much. So why should anybody from school take action, because you are not coming to the classes?

Maybe students are still too spoilt.
A little bit. I think AMFI people are spoilt. Sorry. I just hired a girl here, she just finished school six months ago. So you see she is a starter as well. She had very good internships and she already tried several things and she is from the TMO, she is from another school, but there after 3 months 97% have a job after leaving school. That is a lot, that is almost 100%. I think from AMFI it will be after 3 months 30%. So that is a difference. But they have to do a lot for their presentations, writing motivation letters, writing their CVs. They are more aware that presentation is a thing.

When it comes to design, you have a couple of schools in the Netherlands, which one do you think is the best?
AMFI. But there are also a few good people from The Hague. A few good people always from Arnhem. But for commercial designers AMFI is the best.

Do you think the commercial designer, the stylist, is in a majority? Are the more stylists than authentic designers?
Absolutely. I think the AMFI has too many of the authentic designers. You have to be more commercial. So that is what the AMFI could do, to push more to the commercial side than to the authentic side. Because you are not earning any money with the authentic side. Too less. There are always some special people there.

8.2 FASHION TECHNOLOGY SKILLS
ACCORDING TO INDUSTRY LECTURERS

Fashion Technology Skills for Generation Alpha

This short survey is part of my graduation research as an Int. Fashion Management student, AMFI, on the topic of 'Fashion x Gaming'.
The target group based on my research will be generation Alpha, digital natives born after 2010. To get a better overview and understanding from professionals in the field, on what skills are most relevant to acquire in helping to shape the future fashion technology industry, I would highly appreciate your help by filling in the following question.

What is your current job position?

Teacher / Researcher Virtual fashion design and prototyping

What skills are most relevant to acquire when thinking of the future fashion industry and connected to which profession/job role?

I think the freedom of creation and independent thinking is most important in a learning environment where self regulating learning is stimulated and expected. Divers research skills help you building up best expertise. Learning to understand divers and complex systems/structures to shape your ideas is core. Learning to play and interact with them by joy and by trial and error. Be able to create a personal working method and handwriting that fits your expectations and be aware of the development in the market/world. With curiosity, flexibility and awareness you are able to adapt new developments. Exchange ideas and learn to create meaningful products in interdisciplinary groups. Learn to find your passion, enlarge your expertise and inspire others.

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What is your current job position?

Leading Circular Textiles Program Circle Economy/Coordinating Sustainability AMFI

What skills are most relevant to acquire when thinking of the future fashion industry and connected to which profession/job role?

System thinking & system design // multi-stakeholder (project) management // IT, programming and data management // Impact assessment (eg. LCA)// creative business development

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What is your current job position?

Fashion & Management Lecturer and Coordinator

What skills are most relevant to acquire when thinking of the future fashion industry and connected to which profession/job role?

Technical Skills -> Development & production (new types of production)
IT Skills -> Development, production, marketing & retail (From 3D prototyping to 3D virtual retail environment)
Analytical Skills -> Marketing & retail (Data analytic)
Multi-tasking Skills -> e.g. Buyer & merchandiser becoming one job
Research Skills -> Overall, the whole fashion chain. Every profession will change quicker and demands new knowledge and skills to solve problems.

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What is your current job position?

Educator in Digital Strategy // Facilitator in Creativity & Transformation

What skills are most relevant to acquire when thinking of the future fashion industry and connected to which profession/job role?

functional skills are important, but very important one is 'human skills or some call it soft skills...[Self Control, Perception, Influence, emotional intelligence, compassion, clear communication, team skills, etc]
A lot of the future of work is self organised, team and project based.

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What is your current job position?

Coordinator & Lecturer AMFI

What skills are most relevant to acquire when thinking of the future fashion industry and connected to which profession/job role?

Common all jobs in the future, I believe the skill most needed is problem solving abilities and especially related to fashion & technology. The speed of technology changes fast any equally working in the fashion industry requires being open to change and being optimistic for the future. Designers will have to become more fluent with digital skills, designing and prototyping on 3D programs. Brands like Tommy Hilfiger are already trying to implement this. The Merchandisers and sales team no longer plan or sell from physical samples but digital screens. This for the fashion industry was a big change in mindset to turn around. But is the future, sustainability wise we can not keep producing in the same we do. Sampling is one of the most wasteful processes in the supply chain. Buyers, will need computing skills to be able to analyse big data, spot trends and patterns and act accordingly. The focus will be on creating algorithms to spot trends in the online world. Also common for jobs in future, candidates should have collaborative working and intercultural skills as well as the personality trait of empathy. One concern of mine, is that recent studies has shown that empathy has decreased in young people, in relation to time spent on screen. Empathy a vital component in emotional intelligence and needed for any job but most likely generation Alpha have a game already to increase or learn this trait.

Fashion Technology Skills for Generation Alpha

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What is your current job position?

Principal Design Lecturer / AMFI

What skills are most relevant to acquire when thinking of the future fashion industry and connected to which profession/job role?

A balance between skills and vision is essential. Skills: Being able to acknowledge (and work with) the power but also flaws of virtual design.

This short survey is part of my graduation research as an Int. Fashion Management student, AMFI, on the topic of 'Fashion x Gaming'.
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What is your current job position?

lecturer/researcher
_____

What skills are most relevant to acquire when thinking of the future fashion industry and connected to which profession/job role?

Connect to/design/make/repair/renew for or with your own generation.
For conscious fashion professionals in 2030 it is most urgent to work with 'positive lists' (sourcing from listed materials that are good/healthy for the environment and people).
In 2030 [fashion] professionals are individually accountable for their corporate actions' impact on the environment as well as society, so they should master to quantify the impact of their actions (next to profits, losses, investments, order quantities, left-overs, quality, capacity, living wages, occupational safety & health, etc. you also are able to quantify your use of energy, H2O, recycled materials, as well as how much greenhouse gasses you emit, how much radiation you produce, how much waste your consumer produces with your product(s).

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What is your current job position?

lecturer AMFI
_____

What skills are most relevant to acquire when thinking of the future fashion industry and connected to which profession/job role?

An interesting site on the future workskills is: http://www.iftf.org/futureworkskills
Those 10 skills (and drivers) are now being used in the skills classes of Fashion & Management. To my opinion these are all meta skills (also a book from Marty Neumaier - skills for the robotic age) and highly important for any education program for applied sciences.
 In our program 2nd yr students have to 'measure themselves' to which extend they possess these skills and/or if they have a certain talent(s) for a certain skill -> this can give them direction towards a certain profession/position in the industry. If you, for example, have a strong computational mind and skills you can develop this your specialism/ usp

Fashion Technology Skills for Generation Alpha

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What is your current job position?

3D designer

What skills are most relevant to acquire when thinking of the future fashion industry and connected to which profession/job role?

Tech skills, especially 3D design, surface design and rendering skills. Not only for designers but for marketing and advertising.

8.3 GENERATION ALPHA AND THEIR USE OF TECHNOLOGY

ZUSAMMENFASSUNG | EINZELANSICHT

Antworten möglich

first name / sex /age of the child | Vorname und Alter des Kindes
16 Antworten

Is your child familiar with the use of various touch-devices (iPhone,Tablets…)? | Ist ihr Kind mit dem Umgang von diversen Touch-Geräten vertraut (iPhone/Tablets…)?
16 Antworten

- Yes/Ja
- No/Nein
- Ja/Yes
- Ja

75%
16,6%

Does your child play apps and if so which apps are their favorites and why? | Spielt ihr Kind mit Apps und wenn ja welche Spiele sind besonders attraktiv?
16 Antworten

Snapchat
Snapchat
Snapchat
Snapchat
Snapchat
Snapchat
Snapchat
Snapchat
Snapchat
Snapchat
Musically
Musically
Happy Chef, Geometry Lite

How many hours per day does your child spend in front of a computer/tablet/tv/phone? | Wie viele Stunden verbringt Ihr Kind täglich vor dem Computer/Handy/Fernseher?
16 Antworten

- 0-2
- 2-4
- 4-6
- 6+

81,3%
12,5%

Would you be in favor of a game that extends the scope of the technical professions to your children? (e.g. technical jobs in the fashion industry) | Würden sie gern ein Spiel sehen dass ihrem Kind das Anwendungsbereich der technischen Berufe erweitert? (z.B in der Modewelt)
16 Antworten

- Yes/Ja
- No/ Nein
- It does not interest me/ Ich kann damit nichts anfangen
- Ja/ Yes
- Ja
- Nein/ No

68,8%
12,5%

What are job positions most attractive to your child? | Welche Berufe in der Modewelt sind am attraktivsten für ihr Kind?
16 Antworten

- designer / Designerin
- blogger / Bloggerin
- sales / Verkäuferin
- manager / Managerin
- Model
- Buyer / Einkäuferin
- Sonstige

56,3%
25%
12,5%

What would be important to you as an authority person to see in a game for your child? (e.g. learning factor, insight into different professions, mathematical approaches …) | Was wäre Ihnen als Autoritätsperson wichtig in einem Spiel für ihr Kind zu sehen? (z.B Lernfaktor, Einblick in verschiedene Berufe, mathematische Ansätze…)
15 Antworten

STEM, because this will help keep Fashion being taught in Highschool's in Australia, currently it is disappearing!
STEM, because this will help keep Fashion being taught in Highschool's in Australia, currently it is disappearing!
STEM, because this will help keep Fashion being taught in Highschool's in Australia, currently it is disappearing!
STEM, because this will help keep Fashion being taught in Highschool's in Australia, currently it is disappearing!
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STEM, because this will help keep Fashion being taught in Highschool's in Australia, currently it is disappearing!
STEM, because this will help keep Fashion being taught in Highschool's in Australia, currently it is disappearing!
Allgemeine Förderung, verschiedene Berufe und was man dafür tun muss um das zu erreichen
Abbildung der Wirklichkeit, welche Entscheidungen muß ich treffen
learning factor

Which fairytale is most fascinating to your child? | Welches Märchen fasziniert ihr Kind am meisten?
16 Antworten

Cinderella
Cinderella
Cinderella
Cinderella
Cinderella
Cinderella
Cinderella
Cinderella
Cinderella
Cinderella
Schöne und das Biest
Rotkäppchen
Keines