Co-creating with children

Arts and Crafts Toys

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This report, commissioned by company X, describes the bachelor's assignment of Hilde Smits. Company X wants to expand their product range in the arts and crafts toys segment. This project aims to create a set of guidelines to navigate the arts and crafts toys market and to integrate co-creation in the company.

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Samenvatting

Dit project is uitgevoerd voor bedrijf X en heeft als doel richtlijnen op te stellen voor het lanceren van nieuw knutselspeelgoed. Knutselen is een verzamelnaam voor creatieve activiteiten die als doel hebben het maken of versieren van een object. Knutselen verbetert de cognitieve en motorieke vaardigheden van een kind.

Kinderen ontwikkelen hun knutselvaardigheden naarmate ze ouder worden en hun werk neemt dan toe in realistischheid. Als men producten ontwerpt voor kinderen is het belangrijk om deze vaardigheden in het achterhoofd te houden. De doelgroep van knutselspeelgoed is zeer breed en bedraagt alle kinderen van de leeftijd 1 tot 12 jaar en hun ouders of voogd.

Meisjes zijn over het algemeen eerder geïnteresseerd in knutselen dan jongens door hun eerder ontwikkelde fijne motoriek en minder agressieve aard. Dit creëert het stereotype dat knutselen meisjesachtig is; er is echter geen bewijs dat meisjes creatiever zijn.

Knutselspeelgoed is een trendy categorie waar nieuwe producten vaak maar beperkte tijd populair zijn, onder andere door licenties. Alle succesvolle producten hebben met elkaar gemeen dat ze of innovatief zijn of verkocht onder een licentie. Andere aspecten die de populariteit beïnvloeden zijn verzamelbaarheid, lage prijzen, en een variëteit aan creatieve mogelijkheden, maar het meest belangrijke aspect is wat het kind wil.

Het complete aanbod van knutselspeelgoed is verdeeld in 8 categorieën, Figuur 0, die op verschillende aspecten, zoals prijs, populariteit en concurrentie, beoordeeld zijn. De categorieën met de laagste gemiddelde prijs zijn Stempels & Stickers en Mode & Sieraden. Tekenen & Verven en Modelleren hebben de meeste bestsellers en Tekenen & Verven en Stempels en Stickers zijn de categorieën met de meeste concurrentie.

1. Tekenen & Verven
2. Modelleren
3. Mozaïeken
4. Mode & Sieraden
5. Stempels & Stickers
6. Handwerk
7. Knutsel Sets
8. Benodigdheden

Figuur 0 Knutselcategorieën

Deel van de opdracht was het onderzoeken van de mogelijkheden om co-creatie te integreren in het ontwerpproces. Er zijn vier hoofdvormen van co-creatie, feedbacksessies, brainstormsessies, ontwerpworkshops en customisation. Bij feedback- en brainstormsessies is het belangrijk om vooraf duidelijke doelen en een structuur te hebben. Bij ontwerpworkshops worden kinderen een deel van het ontwerpteam. De workshops kunnen functioneren als ideegeneratie of een inzicht creëren in de wensen en ervaringen van kinderen.

Customisation is het leveren van op maat gemaakte producten en een aantrekkelijke optie in de speelgoedindustrie, zeker in de knutselmarkt. Als klanten de optie hebben om een product zelf te maken, voelen ze zich meer verbonden met het product en het merk. Het makkelijkst te implementeren in een bedrijf is adaptieve customisation, waar het bedrijf een standaardproduct levert dat de klant vervolgens kan aanpassen.

Abstract

This project is executed on behalf of company X and aims to create a set of guidelines with which they can navigate the market of arts and crafts products. Arts and crafts are creative activities aiming to create or decorate an object, improving a child's cognitive and fine motor skills.

Children develop their art skills as they age, their work becoming increasingly realistic. When designing products for children it is important to take into account their abilities. The target group of arts and crafts toys is very broad, as it includes all children aged 1-12 and their parents or guardians.

Girls tend to take an interest in arts and crafts earlier than boys, due to their more advanced fine motor skill on a young age and less aggressive nature. This creates the stereotype that arts and crafts are a girly trade; however, no evidence exist of girls being more creative.

Arts and crafts is a trendy category of toys where products often lose their popularity after a couple of years due to their affinity for licence deals. All successful new products have in common that they are either innovative or are sold under licences. Other influential features are collectability, low prices, and a variety in creative possibilities, but the most influential feature of all is what the child wants.

The complete market of arts and crafts products has been divided into 8 categories, Figure 0, that have been rated on various categories, like price, popularity and competition. The categories with the lowest average price are Stamps & Stickers and Fashion & Jewellery. Drawing & Painting and Modelling contain the most bestsellers, while Drawing & Painting and Stamps & Stickers are the categories with the most competition.

1. Drawing & Painting
2. Modelling
3. Mosaics
4. Fashion & Jewellery
5. Stamps & Stickers
6. Needlework
7. Crafting Sets
8. Supplies

Figure 0 Arts and crafts categories

Part of this research was to examine the possibilities of co-creation in the design process. There are four main forms of co-creation, feedback sessions, brainstorm sessions, design workshops and customisation. For a feedback or brainstorm session, it is important to have clear objectives and a test structure to fall back on. Design workshops entail actively inviting children to be part of the design process. They can function as an idea generation or an insight in children's preferences and experiences.

Customisation is an attractive option in the toy industry, especially in the arts and crafts market. When customers have the option to make a product their own they will feel more connected to the product and the brand. Easiest to implement is adaptive customisation, a standard product that the user can customise.

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Introduction

The client wants to improve its market position in the arts and crafts (A&C) segment by adding products to their range in this market segment. The goal of the client is to gain insight in the interaction children have with different arts and crafts products and their motivations to play with certain products.

Company X is looking for guidelines on which to base their product launches in the arts and crafts segment. Ideally the final product (the creation of which lies outside of the scope of this project) will consist of a small product range with opportunity to expand in the near future.

An important tool used in this thesis is co-creation. A method to involve different parties, in this case the end users, in the design process. Together the parties can produce an outcome that is mutually beneficial. It helps customers to create a product that better suits their needs and it helps the company to gain insight in these needs and generate new, refreshing product ideas.

Analysis

1. Arts & Crafts

Arts and crafts are the skills of making objects, often with a decorative function. Most arts and crafts activities are practised as a hobby. Many toys in this field, like modelling clay or stamp sets, have been around for decades, passed through generations. The toys will always be around for their educational value and the creative outlet they offer to children and adults alike.

Even though they are often mentioned in the same breath and certainly related, there is a distinct difference between arts and crafts. Anna Reyner, art therapist, writes for Early Childhood News: *"While art is an open-ended or 'unstructured' activity, crafts are goal oriented or 'structured.'"* The left side of Figure 1 shows a typical art activity. Painting is about the process, there is no apparent end goal when the activity is started. Activities like decorating, modelling or mosaics are also examples of art. The right side of Figure 1 shows a crafting activity. Crafting children often work with an example and are challenged to achieve the same result. Examples of crating activities are needlework activities or making jewellery. While creating art helps develop imagination and expression, crafting develops cognitive skills.

Figure 1 Examples arts (left) and crafts (right)

The line between the two activities can be blurred. Painting for example, an art activity in its core, can be part of a crafting activity as well. In this report, the distinction between arts and crafts will not be made unless explicitly mentioned. The term 'crafting' will refer to the process- and the term 'art' to the result of both making art and crafting.

Still, process and product are two important factors to consider when designing arts and craft products. It is hypothesised that parents and guardians concern themselves more with the process to make sure their children learn from the activity and develop not only their physical abilities, but also skills like creative thinking. However a 2015 study by Junior City concluded that most children think it important to own object that they made or decorated themselves and that the value of work creates an emotional attachment to the product and the feeling of accomplishment. So while children certainly enjoy the process, they might enjoy the results even more.

Arts and crafts are generally not activities children can do independently. They often need help setting up and cleaning afterwards, although supervision can be limited when the child is actually playing (depending on the age of the child and the activity). When aiming for an autonomous activity, children should be in the upper part of the recommended age range.

1.1 Educational value

Child development involves learning and mastering skills. Toys can stimulate this development in many different areas. Arts and crafts help develop cognitive (problem solving) skills and fine motor skills. As these skills develop, children are able to work on more complex and detailed projects. Reyner describes the many benefits of crafting in different developmental areas:

Cognitive skills

When crafting, children are constantly facing decisions about the shape or details of their project, teaching them to solve problems they encounter. It enhances their ability to think creatively, because there are no limitations when creating art. They are free to experiment with different tools and materials and experience the different results they get.

Crafting makes children look at their surroundings and analyse and describe them. It also helps children to understand concepts like colours and numbers.

Emotional skills

Self-expression is the foundation of making art. Children learn to express their emotions through art and it can unconsciously help them deal with personal stress and trauma. Art can be an outlet for both positive and negative emotions.

Art can also be a confidence booster. Children learn to develop a sense of pride in their work. Children that may be behind in certain subjects can excel at arts and crafts.

Social skills

Crafting is an ideal activity for social settings, in which children learn to collaborate and share with others. It is also a great activity for shy children, where they can comfortably participate in an environment that is not competitive.

Coordinating skills

Crafting is an important activity for children to develop fine motor skills. Young artist will first learn how to hold a pencil and eventually develop these motor skills in order to create patterns and guided movements. It also increases hand eye coordination.

2. Target group analysis

The target group in the beginning of this research is broadly defined as all children of the ages 0 to 12 years old and their parents. The target group analysis explores the relation to crafting for children of all ages and genders.

2.1 General Analysis

Unless explicitly mentioned, the general analysis is based on assumptions made about the target group.

Children

Age: 0-12 years (effectively 1-12 years)
Gender: All genders
Education: No education or elementary education
Ethnicity: All ethnicities
Religion: All religions

Children enjoy playing. It is one of their main activities throughout their elementary education as the education in the phase does not yet extend outside school hours. Part of this playing time will be spent on arts and crafts activities. Of course all children are different and grow up to have different interests, personalities and skills. Therefore it is difficult to draw conclusions about behaviours and interests that ring true for all children. Arts and crafts however contain a very broad set of activities and all children will come into contact with one art form or another. Precisely because of varying interests, every child is bound to enjoy some form of art.

Children often start their creative careers with scribbles and will use these fine motor skills to develop their own handwriting when they get older. Even when parents somehow manage to withhold arts and crafts in their child's upbringing, they will get acquainted with different arts and crafts products in school. Their educational value and ability to captivate a large group of children make arts and crafts activities great for schools or day care centres.

The aforementioned study by Junior City also examined the reasons children made art. 40% modelled behaviour from their parents, school or television, 30% of participants answered that they wanted to have fun and others mainly just wanted to pass the time. 6 out of 10 participants thought it important to decorate their room with objects they made themselves. So there is certainly a place for traditional arts and craft products in the fast evolving toy market.

Parents and guardians

Age: 25-40 years
Gender: All genders
Education: No higher education to university graduate
Marital status: Single or together
Occupation: Stay at home parents or all other occupations
Income: All incomes

Ethnicity: All ethnicities
Religion: All religions

Parents or guardians (hereinafter just parents) are the main caretakers of their children and function as main buyers of the toys. Therefore it is equally as important to interest them in a product as it is to interest the children. All parents differ in personality and pedagogic style. Where one parent has the resources to stay at home, other parents may be working a lot to provide. Every family has a different dynamic. So just like their children, it is difficult to draw general conclusions about every parent or family.

Parents look at toys differently than their children do. Parents will judge it beyond their child's excitement. They will most likely be interested in the quality, price or hazards of the product. Arts and craft is a traditional market, with products that parents, and even grandparents, remember from their own childhood. This nostalgia may be an incentive to buy certain products.

Buyer/user dynamic

Most markets have a clear target group: the consumer of the goods or services offered by a company. In the toy industry however, there is an interesting dynamic between the consumer and the buyer, since they are not the same person. As a toy company, company X has a lot of experience dealing with this dynamic. However, whereas their areas of expertise, action games and impulse toys, are mainly driven by children's demands, arts and crafts could be an area that is more influenced by parents' preference.

It is unclear who initiates the buy of arts and crafts products and what their motivation is. It is predicted that parents will motivate children to play with arts and crafts products more than they do with other toys in order to stimulate their physical and creative development. In practise, this would mean that parents will be more motivated to buy arts and crafts products than the children.

On the other hand, arts and crafts often require supervision and help with setting up and cleaning up. The expected mess of some art activities alone might be enough to turn away potential customers. Some parents may simply not have time to invest in arts and crafts. Further research will examine the exact motivations parents have to buy toys in general and their attitude towards craft activities.

2.2 Gender

In order to determine whether or not to market specific toys to a specific gender, it is important to know the gender differences relating to crafting behaviour. Are there any noticeable differences? And if so, what causes them?

Nurture

Stereotypes divide the world of arts and crafts in 'boy' and 'girl' crafts, with the majority, especially the finer forms of art, leaning towards the feminine side. An explanation for this is that historically, crafts such as knitting or embroidery have been predominantly practised by housewives. On top of that, many forms of crafts aim to decorate, a typical feminine behaviour. Gender stereotypes are easily picked up by children, who will often conform to them in order to fit in.

Toddlers begin to form concepts of gender when they are two years old and most know their own gender by the time they are three (Martin & Ruble, 2004). Without inhibition, children will choose the toys they enjoy most in these first years. Almost as soon as they become aware of their gender however, they start searching for gender cues on how to act. Children will see a dividing line between boys and girls and get firm ideas about how they should behave. Aina & Cameron (2011) state that even when parents avoid gender stereotypes in the upbringing of their children, they will pick it up from media, consumer products and other adults or peers in their life. This causes children to start playing with friends of their own gender and to choose gender-specific toys. By this reasoning, girls are more likely to pick up arts and crafts activities than boys.

Nature

Research on innate creativity differences of both genders is rare, as it is difficult to measure. A common variable to test is the ability to apply divergent thinking, a method that aims to generate multiple solutions to a given problem by exploring opportunities in different areas.

Kogan (1974, p.1) opened his research on gender differences in creativity with a thought that is still valid today: *"Any evidence offered by behavioral scientists to support a claim that men are more creative than women, or vice versa, would surely have to run the gauntlet of critics who would point to methodological inadequacies or contrary evidence."* This summarises correctly that even when there is conclusive evidence favouring one gender, there is another study contradicting these results in favour of the other.

Even though boys and girls can be seen as equally creative, both genders tend to express this creativity in different ways. These differences are not completely created by nurture, as nature plays a part as well. For example, boys tend to evolve their gross motor skills (running and jumping) before girls, whose fine motor skills (holding a pencil and writing) improve first (Pahlevanian & Ahmadizadeh, 2014). On top of that Parke & Slaby (1983) found that boys tend to play more aggressively than girls. Aggression here is defined as hostile behaviour or the use of force. Since arts and crafts often contain more delicate trades, girls are, by nature, more likely to take an interest in arts and crafts. As children grow older and gender differences in aggression and motor skill decrease, the stereotype of crafting as a girly activity is persistent.

There is also a notable difference in group size when playing. Boys tend play in larger groups, while girls seem to have a preference for intimacy (Belle, 1989; Benenson et al., 1998). Although neither Belle nor Benenson offer any further explanation of this phenomenon, this behaviour supports the notion that girls would enjoy crafting more than boys. Arts and crafts are often more solitary activities, where children work on individual projects.

It can be concluded that nature explains the existence of the stereotype that arts and crafts is ‘girly’. When children grow up, gender differences in fine motor skills and aggressive playing behaviour fall away and the stereotype turns into a self-fulfilling prophecy favouring girls. However, designers of arts and crafts products should be careful to dismiss boys in the target group.

2.3 Age

Arts and crafts include activities for all ages, but as a child grows up and their artistic abilities develop, different products are appropriate for different age groups. The team at parental information blog Kidspot.com.au warn parents against introducing products too soon or too late to their children. If an activity is too hard, the products will be cast aside and children will likely never take an interest in it. When introduced too late, children will find the products 'childish' and lose interest quickly. A correct age indication on product packaging functions as an important guidance for parents.

The Consumer Product Safety Commission (CPSF) produced age determination guidelines, relating children's ages to toy characteristics and play behaviour.

0-11 months

Arts and crafts are generally not appropriate for children under 12 months. In this period children first develop the fundamental skills needed for these activities. Their behaviour starts to become more coordinated, resulting in the gripping and examining of objects. Children start to understand simple cause-and-effect relationships. However, children generally do not start to scribble when they reach the age of 1.

When children do start to draw, their artistic development from that point is described by Viktor Lowenfeld (1947) in 5 stages depicted in Figures 2a through 2e.

1-2 years: Scribbling stage

When children start to draw, it starts with disordered scribbles, simple records of kinaesthetic activity. After the first year of scribbling, drawings start to become more orderly, as a child starts to focus on what they are drawing and the scribbles start to represent something to them. Toddlers of this age become increasingly curious, facilitated by their increasing mobility and coordination. Their behaviour starts being goal-directed instead of consisting of random movements.

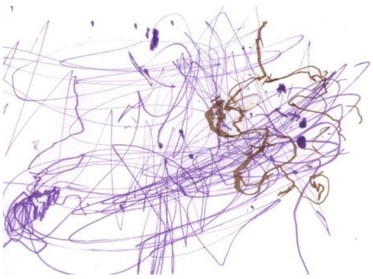

Figure 2a Scribbling stage

Art materials for children of this age should be appropriately sized for their grip, lightweight and sturdy and they should consist mostly of drawing materials. As they approach 2 years, children also start to learn to string large beads. Since children still have the urge to explore objects orally, paints, unless completely edible, are not advised.

3-5 years: Pre-schematic stage

The pre-schematic phase in children's art starts to resemble what it is meant to represent. They are experimenting with a set way of portraying things like humans or animals and can add up to seven parts (lines) to one drawing. They are always exploring new concepts, so symbols still change a lot.

Suitable toys for this age should still be lightweight and sturdy. Children can use plastic tools, like scissors and non-toxic glue. They learn how to string small beads in copied patterns, use modelling clay and all sorts of drawing materials can be introduced, appropriately sized to their grip.

Figure 2b Pre-schematic stage

6-8 years: Schematic stage

During this stage the child arrives at a 'schema', a definite way to portray concepts, for example people will always look the same and all objects are grounded at the bottom of the page. Children are most interesting in exploring through their art and experimenting with many different art supplies. Traditional arts supplies are very popular with children around the age of 6 and 7, since they will not limit the child's imagination and enable them to create freely.

Figure 2c Schematic stage

Around the age of 8, children can follow direction included in kits to complete an activity. As art becomes more product and skill oriented, they will enjoy 'adult' activities, like woodworking or sewing, more and more.

Toys suitable for this age category are all crafting materials and tools, unless they are too sharp. Children become increasingly interested in kits that enable them to make products like candles, soap or paper dolls, although they may not be able to finish the projects until they approach 8 or 9 years. Jewellery creating activities, like braiding, weaving or working looms, also gain popularity as well as hair and fashion related products.

9-11 years: Dawning of Realism (Gang stage)

The generalisation of the schema does no longer suffice, as preteens notice details in reality that are not included in this schema. This eye for detail results in the drawing of many individual parts, but often the proportion still creates an unrealistic picture. Spatial relations are further developed and drawings contain overlap in shapes and a horizon line. Children become more critical of their work and start comparing their work to their peers.

Figure 2d Dawning of Realism

This age sees children's fine motor skill approaching an adult level. This enables them to engage in more detailed activities, like calligraphy, crocheting, mosaics, ceramics and needlepoint. They can choose to receive technical training in certain arts. When creating products for this age category, there is a decreasing emphasis on hazards as children become more responsible and able to prevent injuries themselves.

12-14 years: Pseudo-naturalistic stage

This stage marks the end of art as spontaneous activity as children are more and more critical of their drawings. Children at this age will actively pursue crafts they enjoy and choose which skills they want to develop. Their art skills become more realistic and can contain shadows, perceived motion and three-dimensional objects.

In the arts and crafts section they will most likely play with the same products as years 9-11, but as they develop, they will start creating more intricate designs or realistic art.

Figure 2e Pseudo-naturalistic stage

15+ years: Period of decision

Artistic skills have to be pursued consciously. Teenagers will be very aware of the faults in their art and tend to be easily discouraged. When they do choose to develop their skills, the young artist is able to choose their materials and tools themselves. More and more they will skip the toy store in favour of specialized arts and craft stores.

A timeline of children's development and appropriate products to introduce based on age can be found in Figure 3.

Figure 3 Timeline of suitable products per age category

2.4 Safety Standards

The timeline of a child's development corresponds to safety standards. Toys, like all consumer goods, are subjected to regulations that ensure the safety of the products. Not all standards are compulsory, but when designing any product it is important to heed the guidelines in order to avoid accidents and product recalls. Safety guidelines in regard to children are especially important, since children are prone to explore products and use them in non-intended ways. Common potential toy hazards include: choking on small parts, cuts by sharp parts or ingestion of chemical substance.

The Nederlands Normalisatie Instituut (NEN) is a Dutch institution that creates proprietary, industrial and commercial standards. These standards are not mandatory, but can be referred to in governmental regulations. The NEN is bound to adopt the European norm in their standards, so the safety norms are applicable to the European guidelines.

Practical guidelines (NPR-CR-14379:2002) created by the NEN describe how toy characteristics should be matched to children's age. This documents differentiates 2 age categories, <3 years and ≥3 years, based on average child development. The age determination guidelines by the CPSF have been consulted as well.

The most important requirements for arts and crafts products intended for children younger than 3 years old are:

- Large products, so they can be easily held
- No small removable parts to avoid choking hazards
- Lightweight

- Sturdy
- No toxins, so the product can be orally explored
- Round shapes and no sharp edges
- Little colour variety in art sets, typically 6 or less
- Modelling material intended to remain pliable

As children grow older and their ability to avoid hazards on their own increases, the number of safety requirements decreases. When children reach the age of 12, products designed for them only need to take into account the safety requirements that apply to adults.

2.5 Conclusions

Girls tend to take an interest in arts and crafts earlier than boys, due to their more advanced fine motor skill on a young age and less aggressive nature. This creates the stereotype that arts and crafts are a girly trade; however, no evidence exist of girls being more creative than boys. The conclusion on prevalent stereotypes does not necessarily have an impact on the choice of target group, as it is merely a stereotype. Although research of play behaviour proves girls have a predisposition to enjoy arts and crafts, it is by no means an activity exclusive to their gender.

Children develop their art skills as they age, their work becoming increasingly realistic. When designing products for children it is important to take into account their abilities. Toys for young children mostly consist of open-ended activities focussed on colours and shapes. Older children are more interested in detailed work, creating patterns or useful items. When they pass the age of 12 they will lose interest in toys and will instead opt for adult products to use for their art.

The design, interaction and required skill level of a product depends on the specific target group, but the arts and crafts market contains products for all ages and gender. Safety standards are established and need to be heeded in order to avoid accidents and product recalls.

3. Market analysis

The arts and crafts market is part of the complete toy market. In the market analysis the current offer of arts and crafts toys will be evaluated. The products currently available, competing brands and the development of the market will be explored among other subjects.

Many aspects of the market analysis are based on the stock of 7 web stores: bol.com, bartsmit.com, amazon.com, toysrus.com, fishpond.com, onlinetoys.com.au and flipkart.com. However, different aspects, like popularity, price or licence-friendliness, require different search methods and not every web store yielded results in every analysis. In Table 1, the reasons certain web stores were not used for some purposes are explained.

	Appen-dix	Bol	Bart Smit	Amazon	Toys R Us	Fishpond	Online-toys	Flipkart
Best-sellers	B							
Distri-Bution	A							
Price best-sellers	C						Price in AU$	Price in ₹
Price total toys	C					No filter per price	Price in AU$	Price in ₹
Price total A&C	C					No filter per price	Price in AU$	Price in ₹
Price per category	C					No filter per price	Price in AU$	Price in ₹
Licences	E		Few products[1]				Few products[1]	Few products[1]

Table 1 Different web stores used in various analyses

3.1 Categories

In order to analyse the assortment of arts and crafts toys, they have been sorted into eight main categories, Figure 4. The categories are based on web stores and the way they sorted their arts and crafts inventory.

Drawing & Painting is often the first category that comes to mind when thinking of arts and crafts. It contains the standard pen, marker and paint sets, but also products like mandala designers and painting by number.

Modelling contains products like modelling clay and sand, but also other shaping activities, like casting.

Categories

1. Drawing & Painting DP
2. Modelling Md
3. Mosaics Ms
4. Fashion & Jewellery FJ
5. Stamps & Stickers SS
6. Needlework N
7. Crafting Sets CS
8. Supplies Sp

Figure 4 Categories of arts and crafts

[1] There were no or very few arts and crafts products from the tested licences Disney Frozen and minions.

The category Mosaics mainly consists of fuse beads, beads that can be melted together using the heat of an iron. The goal of these activities is to create an image using small pieces of material, often in different colours.

Fashion & Jewellery contains products like beading and bracelet making activities and fashion design. Hair and makeup products, like hair dress dolls or simple nontoxic makeup sets, also belong to this category.

Stamps & Stickers is a self-explanatory category that lends itself very well to the use of different themes.

The category Crafting Sets contains sets with a specific crafting activity often with one specific end result. Examples are sets with which the user can make soaps or dream catchers (product that fit the description 'Make your own ___'). Crafting sets are often isolated products that are not part of a range or have any expansion packs.

Needlework contains activities like sewing, knitting or weaving, which do not necessarily involve needles. Depending on the target group of the product, the needles or other tools have been enlarged, so they are easy to use for children. Most products contain easy to follow examples to create images or useful objects.

The category Supplies makes up the more traditional branch of arts and crafts and consists of materials and tools. This more or less fixed assortment can be found in toy stores, but is mainly sold at specialist shops. Examples of tools are scissors and glue, while materials are products like paper, chenille stems or glitter.

3.2 Competitors

The arts and crafts market is a very competitive market, with many well-known, 'classic' brands that are very strongly embedded in the market. The market is very open, ideas can easily be copied since most products are mere variations of traditional products. On top of that arts and crafts products are relatively cheap compared to toys in general. This creates a low entry level to the market, causing specialised arts and crafts shops or brands that are not native to this segment to launch their own range of craft products.

Market share of arts and crafts products

According to the NPD Group, a company specialised in market research, sales in the arts and crafts market has seen a big increase, +30%, in 2014. This is due to the loom band phenomenon, little rubber bands that can be woven together creating bracelets that became increasingly popular in the summer of 2014.

2015 saw this number decrease again when loom bands lost their popularity quickly. With no arts and crafts products replacing the loom craze, sales settled again. The arts and crafts market share made up 6.4% of the complete toy market in 2015. These numbers were accessed through an in-house research of the arts and crafts market, as they are not publicly available.

Distribution of products

To gain a basic understanding of the current market, the quantity of different products, stock keeping units (SKUs), per category has been analysed. Various web stores offer information on the amount of different products they offer per category. Since the total stock of each store varied largely, the number of SKUs per category has been converted to percentage of the total stock from that store. The complete results can be found in Appendix A.

Figure 5 illustrates the distribution of products on the market. Almost a third of all the products on offer are Drawing & Painting products. One quarter of the available products are Stamps & Stickers. This high number is mainly caused by the large number of stickers available. Fashion & Jewellery and Crafting Sets are also taking up a fair share of the market.

Categories with a low variety of products are the Needlework and Mosaics. Supplies are not diverse in stock either, but this can be explained because they are mainly sold elsewhere.

Figure 5 does not depict popularity of the categories, but a correlation between product quantity and sales can be imagined. After all, why would a company launch products in unfavourable categories? The graph provides an insight in the way the market is put together and the competition in various categories.

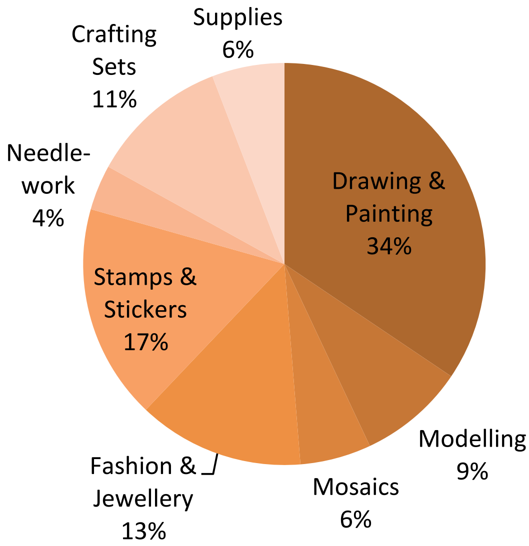

Figure 5 Distribution of the market based on number of products

Brands

It is observed that competitive brands can generally be divided into two categories. The first category contains brands that are specialized in one kind of product. Play-Doh for example only produces modelling clay sets, and HAMA only produces iron-on beads, left of Figure 6. These specialised brands are only relevant when launching a product in this category. Within their category however, these brands are often the main competition, since they use all their time and resources optimising their products and product range.

The second category are brands that put a wide range of products on the market that all fall under the umbrella of creative play. Examples are the European-oriented SES creative and the more US operating Melissa & Doug, right of Figure 6. Their strength is their market representation and consequential a high brand recognition. Weaknesses of these umbrella brands are limited product variety within each category and possibly inferior quality, since they have to divide their resources among several different products.

The categories Stamps & Stickers, Crafting Sets and Supplies do not have any market leading brands, although most products in Crafting Sets are part of umbrella brands.

Crayola is the biggest player in the field of arts and crafts, closely followed by Hasbro's Play-Doh. Crayola is a brand of artists' supplies and best known for its crayons and specialised in products from the category Drawing & Painting. In 2011 Crayola held the second highest share of any company in a single category, only surpassed by LEGO in construction toys (Gordon, 2011). Although these numbers are possibly outdated, as no recent studies are publicly available, it still correctly indicates the success of the company.

Play-Doh, another staple brand on the arts and crafts shelves, is a brand that solely produces modelling clay and sets. Play-Doh (or Hasbro) owns many licences that allow them to make themed sets depicting popular characters, like My Little Pony or Star Wars.

The Toy Industry Association (TIA), the American trade association representing all businesses involved in creating and supplying toys has named both Crayola crayons and Play-Doh clay in their Century of Toys List (2003), a list of the 100 most memorable and best selling toys from the twentieth century. The products were the only arts and crafts products, apart from etch-a-sketch, to make the list.

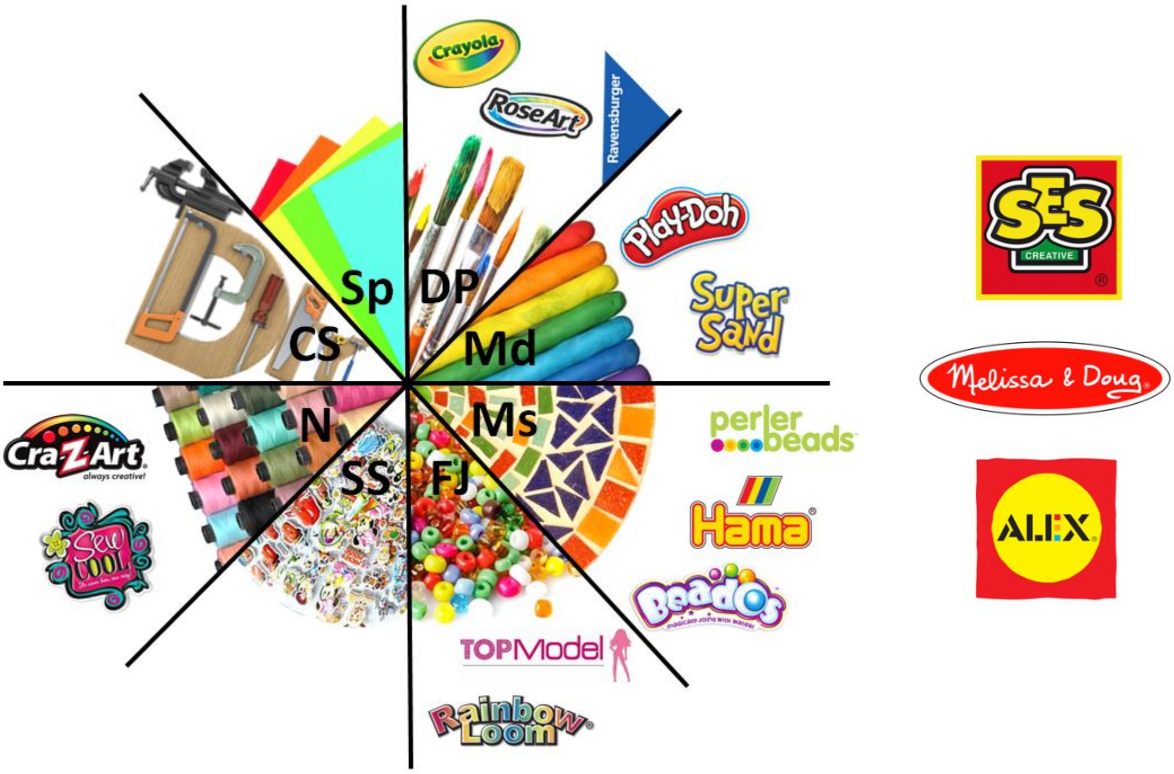

Figure 6 Prominent specialist brands per category (left) and umbrella brands (right)

Figure 7 Best selling arts and crafts products in different web stores on November 5th, 2015
From left to right bol.com, amazon.com, toysrus.com and onlinetoys.com.au

Bestsellers

The 100 best selling items of several web stores have been analysed and sorted in their respective arts and crafts categories. It is unclear how different web stores determine their bestsellers, as it could be based on number of sales, revenue or profit. The results of this analysis serve therefore as an indication of the most popular products and are not conclusive. The term 'bestseller' in this context also holds little weight. Figure 8 shows the results and an overview of the complete results can be found in Appendix B.

It is clear that Drawing & Painting, with 40% of all bestselling items is the most popular category, as well as the category with the most product variety. Figure 7 shows the number one bestsellers from several web stores, all Drawing & Painting products. Items that do well are regular markers or crayons, but painting by number or unique pens also do well.

Modelling is also quite popular, even with the limited number of products that are on the market, only 9% of the total number of toys. Therefore a modelling product would do well in the market, as it is part of a popular category with limited competition.

The reverse is true for Stamps & Stickers, a category with a large number of products (17% of all products) can prevent outliers in popularity. The fact that the popularity of Drawing & Painting supplies does not suffer from the sheer amount of products available (34% of all products), speaks positively for the demand in this category.

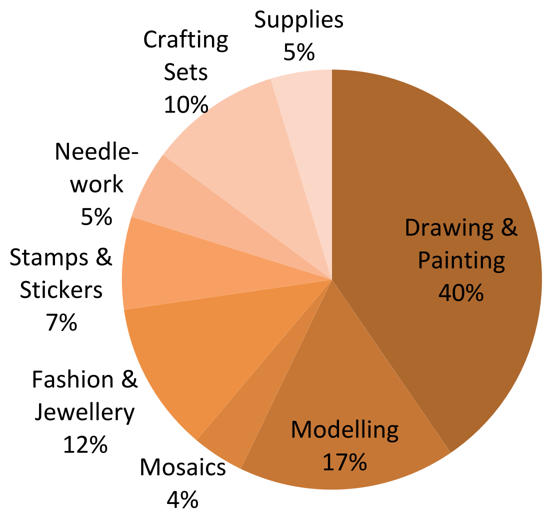

Figure 8 Categories of best selling products web stores

Price

Arts and crafts toys are generally low in price. When delving into the retail prices of arts and crafts, various web stores were consulted and the prices were divided in 4 categories: <10, 10-20, 20-40, <40. These price categories were applied whether the prices were set in U.S. dollars or euros. This may seem to cause an accuracy loss, but retail prices are not as variable as the exchange rate of both currencies. A product that retails for $9,99 on the American market will be priced at the standardised price of €9,99 on the European market, instead of the accurate exchange rate of €9,20[2]. An overview of all price-related data can be found in Appendix C.

In arts and crafts, price categories are observed to represent certain products, Figure 11.

<10	Refills, materials and tools or small single products.
10-20	Small sets or more complicated single products.
20-40	Complete starter sets
>40	Luxury sets and products

The first step to determine the market composition of arts and crafts products when it comes to prices, is to look at the division of prices in all toys versus this division in arts and crafts products, illustrated in Figure 9. Whereas arts and crafts products become more and more scarce when the price goes up, the division of all toys in the different price categories is almost even. This confirms the notion that arts and crafts products are relatively low-priced. The price categories of the best selling items in arts and crafts have been determined as well. Figure 9 shows that these bestsellers follow the trend of the general supply of arts and crafts products.

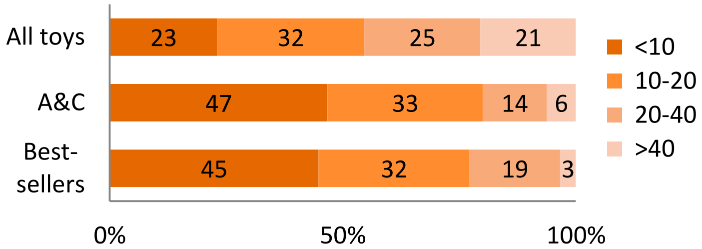

Figure 9 Division of products over price categories in % of total

Analysis of prices in each product category, Figure 10, shows that the categories Stamps & Stickers and Fashion & Jewellery contain the lowest prices, while Needlework and Mosaics are relatively expensive. Although higher prices often contain a bigger margin, there are fewer bestsellers above 20 dollar or euro. Further research will point out if higher or lower prices are more beneficial.

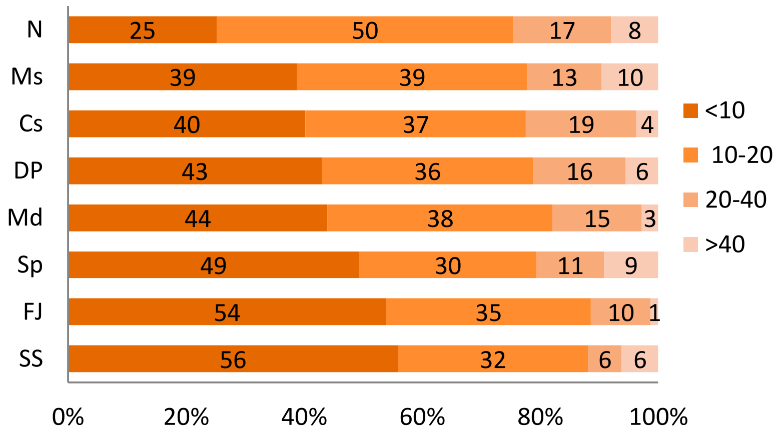

Figure 10 Division of products over price categories per A&C category in % of total

[2] Exchange rate on 14th of January 2016

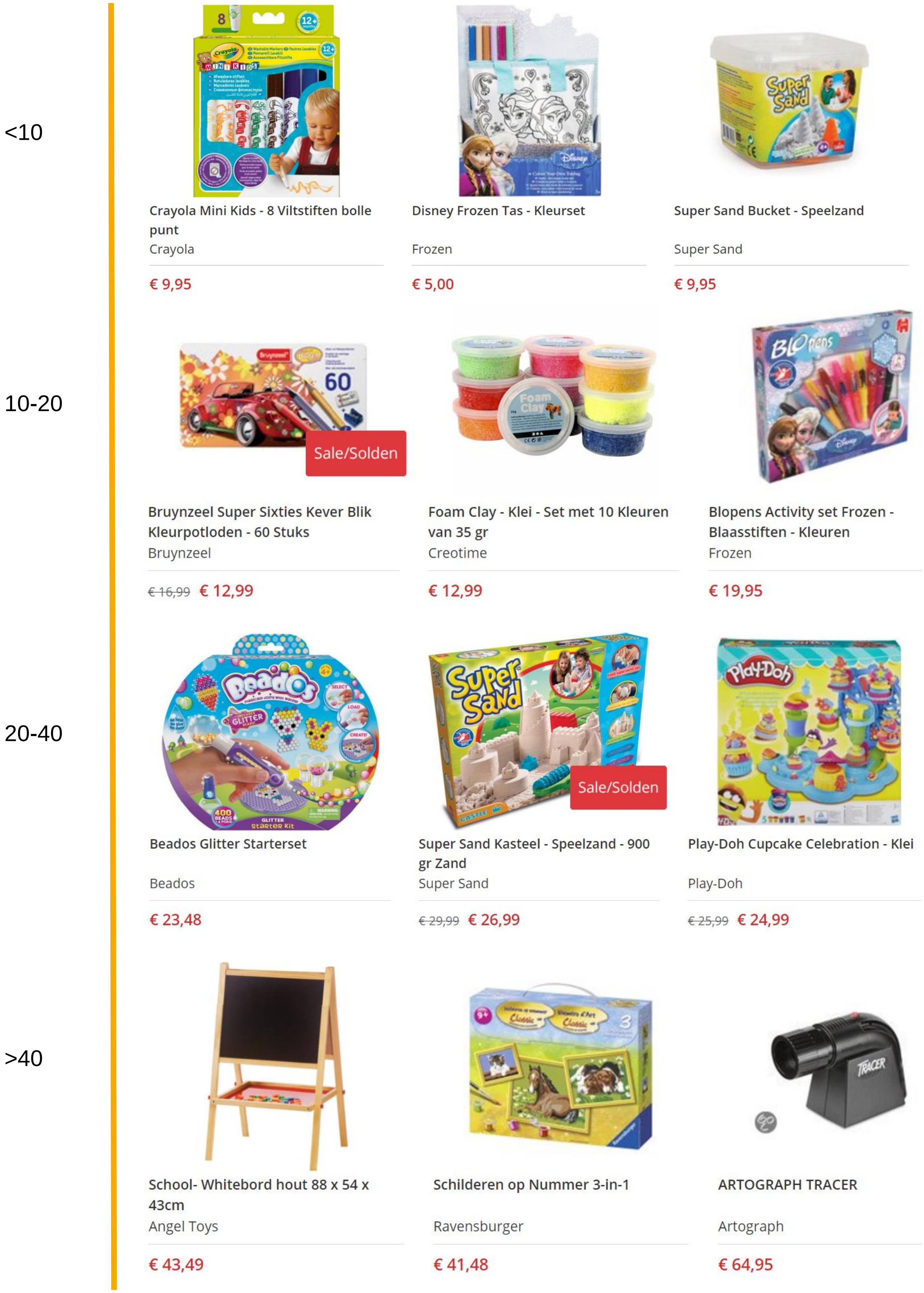

Figure 11 Examples of products in different price categories

Packaging

Product packaging has been ordered per category per recommended age group in Appendix D. The following conclusions are based on this packaging overview.

The packaging design for toys of children up to 8 years old is very similar with bright colours and little text, Figure 12a. Yellow, as a very striking colour, is prominent in many different brands in all categories. As a gender neutral colour, this implicates the products are marketed towards all children.

As children grow up they do not want to play with products that appear to be designed for younger children and therefore childish. Products for ages 8-14 are designed to look more and more mature, with less primary colours and more detail, Figure 12b.

The categories Fashion & Jewellery and Needlework are predominately pink in packaging. Products in these categories promote traditionally girly activities and are therefore marketed towards girls, using a pink colour scheme, Figure 12c.

Figure 12 Examples packaging marketed towards: a. ages 2 to 6 (left), b. ages 8+ (middle) and c. girls (right)

Even outside the stereotypical female categories, arts and crafts toys in general are more marketed towards girls. This is not present in the use of the colour pink, as most packaging design is gender neutral, but it very noticeable the use of models. Several Dutch toy catalogues (Intertoys, Bart Smit and Top1Toys) from 2015 have been examined. Thrice as many girls than boys are depicted in the arts and crafts section. This ratio is present in the models on both the packaging design and the pages of the catalogues themselves.

3.3 Development of the market

The toy market, like any other market, is subjective to trends and hypes. In this context trends are defined as the general direction the market will take and hypes are products that gain extreme popularity very quickly. A hype product can always turn into a staple product of a market when the popularity of a product or concept endures. Most often however, hype products lose their popularity shortly after their introduction to the market.

Arts and crafts are a very trendy category, the majority of the items don't last more than 2-3 years on the market depending on the current trends. Out of the 43 top selling products in the first half of 2015, 15 items were new to the market (in house research company X, 2015). A trend sensitive market can be an advantage or a disadvantage when launching a product. The threshold is low, as the market is open for new products. However, a fickle market is a challenge when desiring a more permanent range that is a minimal of 5 years on the market.

Licences

Part of the trendiness of arts and crafts is due to the licence deals that suit the category well. Most arts and crafts products do not need a radical redesign in order to adopt a licence, new packaging or sticker work is often enough. For example, a licensed colouring book is easier to produce than a licensed doll. Getting your hands on the right licences at the right time can be crucial for a product's success and failing to do so can portion off part of the market.

Figure 13 Examples of popular licenses

When determining licence-friendly categories, two of the current most popular licences have been analysed: minions and Disney Frozen, Figure 13. The stock of these licensed arts and crafts products from different web stored has been analysed. Figure 14 and Appendix E show the results. More than half of all licensed products are Drawing & Painting products, with Stamps & Stickers the second most popular category. Fashion & Jewellery make up a big part of the Frozen products (11.8%), but there are no minion products in this category. The target group of Disney Frozen is almost exclusively female, whereas minions is more gender neutral. Minions is more likely to avoid 'overly girly' products. Therefore, the licence-friendliness of Fashion & Jewellery depends on the target group of the licence.

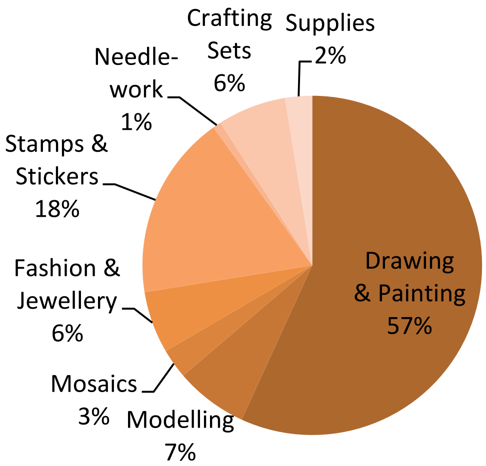

Figure 14 Licence-friendliness of product categories

Trend predictions

The TIA compiles an annual trend report for the entire toy market. Their predictions are based not only on product launches and trendy pedagogic theories, but also on upcoming movies and fashion trends. Their trend report on 2016 trends has yet to come out, but based on continuing trends from 2015 and trend reports from other influencing industries a few predictions can be made.

The New York Fashion Week in September 2015 showed the 2016 spring collection. Trend specialist Appell (2015) noticed multiple collections show patchwork, crochet elements or tie dye. These elements predict an upcoming trend in homemade fashion.

A 2015 trend called the Maker Movement includes toys that allow children to build and create items that are unique to them. It is a movement that encourages creativity and is perfectly suited for products like modelling clay or Drawing & Painting. In August 2015 at NY Now, a trade show in home, lifestyle and gifts, Neuman (2015) observed that highly customisable design was all the rage. This need to personalise your belongings suggest that the Maker Movement trend is here to stay.

It should be noted that these trend predictions are for 2016 specifically. When deciding on products that will launch on a later date, it is advised to consult the TIA website for an up to date trend report.

Hypes

The success of hype products is unpredictable and therefore not very important when looking at the development of the market. Analysing past hypes can be helpful though, when trying to establish what makes popular products so popular. After all, no products are more popular than hype products.

Figure 15 Loom band bracelets

The most recent craze in the arts and crafts market (and the toy market in general) are the loom bands, Figure 15. Even though its popularity is virtually gone again, with its peak in 2014, loom bands were one of the most popular and most sold toys. There are a number of reasons that could have led to this enormous popularity. First of all, loom bands are cheap. Even less wealthy parents could afford to buy the bands for their children, creating a large potential consumer base. Second of all, there is a large variety of products that can be created with loom bands. Not only does this tempt users to try new things and increase their skills, it also causes many different users to take an interest in the craft. Loom bands are not limited to one target group, be it girls, boys or even adults. Last of all, and perhaps the most important factor in many toy hypes, customers always want more of them. Collectable items create more revenue, due to their customers' need to buy more of them. But in contrast to collectables like the Dutch flippo hype, a loom band collection is impossible to finish. When looking to set up a new product range, these factors can be taken into account as ways to improve sales.

3.4 Interviews sales employees

In order to gain a better understanding of the market, the people that are involved in this market on a day to day basis are consulted.

Test design

Employees of toy and hobby stores will be interviewed in person about their knowledge of the arts and crafts market. Hobby store employees will be consulted because they have a different, deeper understanding of arts and crafts. (Older) children that visit these specialised stores are actively pursuing arts and are better able to make their own decisions.

The interviews are orienting in nature and consist of 8 open questions, Appendix F, that are designed to create a broader insight about the products that are currently on the market. Interviewees are also asked to rate the influence certain variables like price or educational value have on the popularity of a product. Parents will be asked this question as well, since they, as main buyers, will have a clearer understanding of this influence. The commentary of sale employees on this subject is therefore not conclusive, but serves only as an indication.

Results

The interviews are conducted on October 2nd and 3rd 2015 with employees of 8 different stores, 5 of which were toy stores and 3 were hobby stores. The toy stores were part of big retail chains and all carried similar stock. Appendix F shows an overview of the questions along with the complete results.

Currently the market is well set with brands that have been around for decades, but the products on the shelves are not fixed. New products are being introduced in different categories of arts and crafts supplies, like the Sew Cool seamless sewing machine or DohVinci, a modelling clay pen. There are certainly hypes in the arts and crafts market, Rainbow Loom is the most recent example, but they do not occur that often. It seems that for a new product to be successful in this market it has to be either innovative and introduce a new technique, or be sold under a popular licence.

Arts and crafts products are mostly sold to or for girls. Even the products that are not marketed towards a specific gender seem to be more popular with girls. As for the parents who buy crafting products for their children, the interviews suggest that the average arts and crafts customer is from the middle to upper class, but there is no conclusive evidence for this.

Although most stores sort their product by category, within these categories the products are often displayed by brand. This can prove to be a disadvantage when launching a new product, as they can be overshadowed by well-known brands.

The results of the rating of different variables that impact the popularity of a product are shown in Figure 16. It suggest that advertorials, the use of licences and a product's educational value have the biggest impact on sales.

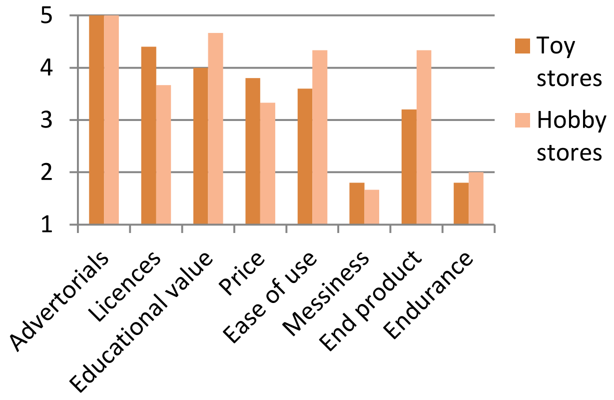

Figure 16 Influence of variables on decision to buy products - Sales employees

3.5 Survey parents and guardians

To better understand the parents' perspective, a survey is designed and spread among them. The survey contains questions about their children's crafting behaviour, the influence they have on this behaviour and their own buying behaviour.

Test design

The survey is spread via social media and online discussion boards. Among the participants a price of company X's toys will be given away as an incentive to fill in the survey. It is conducted in Dutch and a translation of the questions, along with the results, can be found in Appendix G.

Results

The survey rendered 76 useful results, 71 mothers and 5 fathers with a total of 169 children, 73 girls and 96 boys, and 2.2 children per family.

For marketing purposes, it is interesting to know whether or not parents with a higher education (WO and HBO in the Netherlands) stimulate arts and crafts activities more in the upbringing of their children than less educated parents. There are two questions in the survey designed to get this information. The first is the direct question whether or not the participants stimulate arts and crafts. The other has parents rate the amount of time their children spend on certain activities ('Now' in Table 2) and the amount of time they wish their children would spend on these activities ('Wish'), where one of the activities is arts and crafts. Table 1 shows the results, indicating a higher education with 'HE'.

How often does your child craft?		(1) Never		(2) Rarely		(3) Sometimes		(4) Often		(5) Very often		Ave-rage
		#	%	#	%	#	%	#	%	#	%	
All	Now	2	2.6	3	3.9	15	19.7	35	46.1	21	27.6	3.9
HE	Now	1	2.1	3	6.3	11	22.9	22	45.8	11	22.9	3.8
All	Wish	0	0.0	0	0.0	10	13.2	48	63.2	18	23.7	4.1
HE	Wish	0	0.0	0	0.0	10	20.8	29	60.4	9	18.8	4.0
Do you encourage your children to craft?				(1) Actively		(2) Moderately		(3) Not		(4) Discourage		Ave-rage
				#	%	#	%	#	%	#	%	
All parents				40	52.6	12	27.6	15	19.7	0	0.0	1.7
Higher educated parents				22	45.8	16	33.3	10	20.8	0	0.0	1.8

Table 2 Stimulating behaviour arts and crafts activities from all parents vs. higher educated parents

All answers are linked to numbers, 1 to 5 and 1 to 4, and the average answer has been calculated. It shows that higher educated parents actually stimulate arts and crafts activities below average. Although the number of participants, 76 of which 48 had a higher education, is not massive, there is no indication that arts and crafts are activities more stimulated by higher educated parents.

This does not mean that crafting is not stimulated. The general consensus among parents is that arts and crafts are good activities when it comes to responsible parenting, stimulating creative thinking and the development of several useful skills.

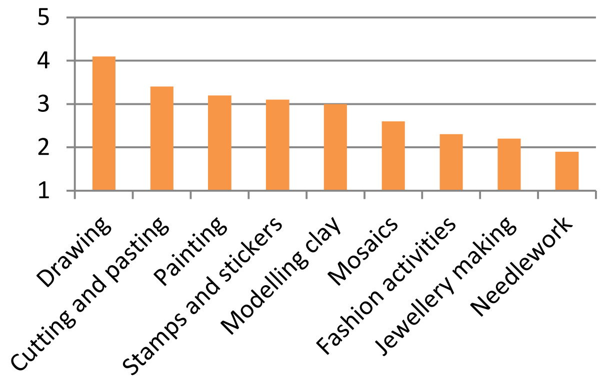

Figure 17 Amount of time children spent on arts and crafts activities

When it comes to popularity of different arts and crafts products, parents had to rate the time their children spent on various arts and crafts activities. 1 corresponded to 'Never' and 5 to 'Very often'. Figure 17 shows drawing and colouring is the most popular activity, this can be explained because it is easy to set up. Fashion, jewellery and needlework activities are not very popular. As there are more sons than daughters among the participants, this unpopularity can be explained by gender stereotypical behaviour.

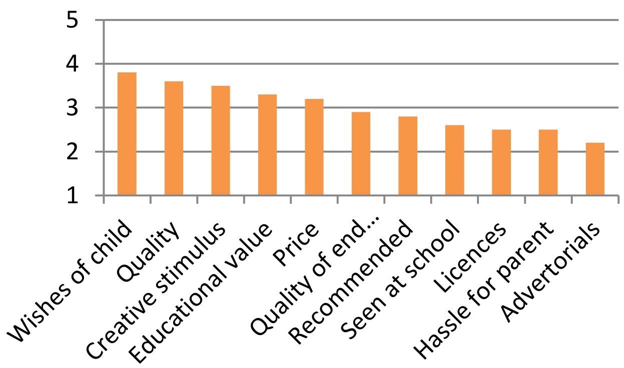

Figure 18 Influence of variables on decision to buy products - Parents

Figure 18 shows the influence certain variables have on the decision to buy a product. Parents consider the wishes of the child, the quality, creative stimulus and the price to be the most influential. They claim to be less influenced by advertorials and themes (licences), but these have a high impact on the children's wishes, so they indirectly influence their behaviour.

Other values parents mentioned as influential are the appropriateness for age (skill level required & safety), the amount of fun it is for the children, aesthetic and the availability in local stores. One parent also mentioned wanting products to not be too pink and sparkly for her son, while another preferred this aesthetic for her daughters.

3.7 Conclusions

The arts and crafts market is a traditional market that makes up 6.4% of total turnover in toys. It is a very trendy category of toys where new products often lose their popularity after a couple of years and many products rely on licences. This can be a strength or a weakness for new products: a constantly changing demand creates a low threshold and easy access to the market, but there is a lot of competition and a more permanent range (5+ years) is hard to establish.

Innovation is present in each category. New products, new techniques or new brands are introduced to every category successfully. So although some categories might be more favourable than others, there are no inherently 'bad' categories for new product launches. All successful new products have in common that they are either innovative or are sold under licences. Other influential features are collectability, low prices and a variety in creative possibilities.

Retail prices of arts and crafts products are low compared to the prices of toys in general, most products, as well as most bestsellers, are under 10 dollar or euro. The survey among parents and the hype analysis point out that low prices are a boost for sales. The categories with the lowest average price are Stamps & Stickers and Fashion & Jewellery.

Drawing & Painting and Modelling contain the most bestsellers, while Drawing & Painting and Stamps & Stickers are the categories with the most competition (that is, they contain the most SKUs). All these attributes, as well as license-friendliness (Drawing & Painting) and predicted trends (Needlework) will be taken into account when determining the most preferable product categories later on in this research.

The gender stereotypes prevail in the market analysis. Interviewed sales employees observe that arts and crafts products are mostly sold to girls. According to the survey among parents the categories Fashion & Jewellery and Needlework are fairly unpopular, presumably because most of the offspring of the participants were male.

Values that are most influential on the decision to buy certain products are the wishes of the child and the quality, creative stimulus and price of the product according to the parents. They disregarded advertorials and licences, although sales employees reckon them to be among the top influences.

There is no evidence that suggest that parents with a higher education stimulate crafting more than average. Arts and crafts activities are generally supported by all parents, regardless of their level of education.

Co-creation

4. Co-creation theory

Part of this research is the practical application of co-creation, or participatory design, in the design process and to create guidelines with which company X can make better use of their customers' experience. Co-creation is a tool that unites companies with their customers and optimises the design process. Figure 21 shows co-creation workshops in practice. To find the right applications for this project, the theory of co-creation is discussed first.

Co-creation is a strategy that brings different parties together in order to jointly produce a mutually valued outcome. The most common application in design is companies working with their customers. Prahalad & Ramaswamy (2000) observed that customers are fundamentally changing the dynamics of the marketplace and are no longer just a passive audience in the process of creation. Nowadays they are a part of the network where they function as co-creators and co-developers. Companies should start seeing them as a source of competence and use the customers' experience to their benefit.

Advantages

Drawing on the broad set of competencies from their users can be a great advantages for a company. They gain a better understanding of the desires and needs of their customers and can cater to them better. Employees that have worked on projects for some time may overlook usability aspects of products that customers are immediately aware of. The involved customers benefit because they can represent their needs, on which improvements will be based. Co-creation offers a unique and personalised experience for customers and as they feel more involved, they are more likely to stay loyal to the brand. The value of this method for the company lies in the increased revenue the improvements to their products or services yield and the more devoted pool of customers.

Figure 19 Co-creation workshop in practice

Co-creation serves as a great way to increase innovation at a low cost. Companies should not expect completely developed concepts, but by tapping into creative skills outside of their own organisation, they can generate a great deal of new ideas. If the process is properly integrated in the company, it can increase productivity and efficiency.

Disadvantages

Co-creation provides the customer with knowledge about their products, so users become more aware of its value and the value they hold as customers. The dialogue between the company and the customers is more and more becoming a dialogue of equals. This gives customers a position of power, where they can negotiate the terms of their deal.

Moreover, co-creation demands a considerable shift in management. The company has to monitor the effects of this shift carefully. Employees might be frustrated by the responsibility they give the inexperienced customer or feel like their job becomes more demanding when they have to take them by the hand. This frustration can also occur the other way around, customers might not want to cooperate with the company or lack the required skills or experience for the task. The expectations of both the employees and the customers need to be shaped, so all involved know what co-creation entails and how they are contributing to the design process.

4.1 Application

Co-creation has 4 main applications: feedback, brainstorm sessions, design workshops and customisation. The most common out of the four and easiest to execute are the feedback sessions. Customers evaluate products, services or prototypes, so companies can discover flaws in their designs. This method helps companies to improve their current output.

Brainstorm sessions and design workshops are the very essence of co-creation, that is, inviting an audience of current customers or other stakeholders into the design team to solve problems. A brainstorm session is a structured conversation, whereas a design workshop leads the participants through a short design process. The fresh point of view of outside sources can provide the company with new ideas and possibilities.

The design company IDEO has mapped out many different methods to practice human-centred design, including brainstorms and design workshops, on their website designkit.org. They defined 4 steps to a successful design workshop.

1. Identify the desired participants, such as a particular demographic or stakeholders.
2. Arrange a space and gather the necessary supplies, for example pen and paper.
3. Make the most of a design workshop with exercises that engage the participants and make them think about the subject.
4. Capture the feedback the group gives you. The goal is not just to hear from people, it’s to invite them into the design team. Make sure that the participants get treated as designers, not as interview subjects.

Another up-and-coming form of co-creation is mass customisation. It combines the flexibility and personalisation of custom-made products with the low costs of mass production. It gives customers the freedom to co-design their product and choose the functionality or aesthetic that best fit their needs. Customisation can give customers a reason to stay away from competitors that do not give them the option to have it their way.

According to a Bain & Company study in 2013, customers who designed their own products visited the company's website more often and stayed on the page for longer. They also gave companies a 50% higher net promoter score, a standard way of measuring customer loyalty, than customers who bought regular products from the same company. Gilmore & Pine described the four approaches to mass customisation (1997), Figure 22.

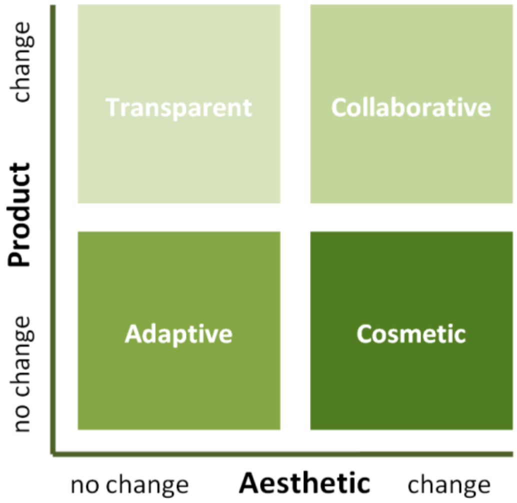

Figure 20 Four approaches to customisation

Adaptive customisation offers one standard product that users can customise themselves. For example, Windows 8 is a modular interface, that users can build based on their preferences.

Cosmetic customisation changes the aesthetic of the product, but not the product itself. An example is Coca Cola's Share a Coke campaign, offering customers bottles of coke with their name on the packaging.

Transparent design offers the customer a product or service that is unique to their needs without them being aware of the customisation. Google for example, sorts their clients' search results based on their internet habits. This way desired websites or information is easier to find for their users.

With collaborative customisation, the company will collaborate with the customer to formulate their needs and create the optimal product for them. An example of this is a personal trainer that create as fitness schedule based on their client's abilities and goals.

With these different approaches, customisation is more present in the current market than one might think, but this does not mean customisation will become the standard. It is mainly a luxury option and some products fare on standardisation, like bolts or batteries. Toys and games however, is inherently a luxury category, so customisation in this field would be a viable option. It suits arts and crafts particularly well, because of their creative nature.

Application competitors

Co-creation is already present in the toy industry. A good example is Hasbro, a large toy company, who opened up their intellectual property to fans of one of their licences: My Little Pony. SuperFanArt.com enables fan to upload their art and to sell 3D printed models of their designs. Instead of prohibiting the business, Hasbro enables and encourages users to interact with their brand, while getting a share of the revenue.

LEGO is also a pioneer of co-creating. Their online platform CUUSO allows clients to submit their ideas for new LEGO products. Fellow users of the platform can vote for the best ideas and LEGO will consider the most popular projects for development. This way customers are actively involved in creating the next LEGO product.

An example of customisation in the toy industry is doll company Makies, that enables customers to design their own dolls, from skin colour to the shape of the ears. The option to customise a toy set is also quite common. LEGO and Mattel's Barbie both offer this option and, within arts and crafts, Crayola offers a custom colour selection in their crayon sets.

When it comes to feedback, brainstorm sessions and design workshops, it is a lot harder to gauge a competitors activity. Although some companies, like the technology company Philips, flaunt this strategy and proudly centre the user in their design process, most companies keep their design process fairly hidden from the public.

4.2 Co-creating with children

Participatory design with children offers a unique point of view on the design process. Children are often more creative than adults. Their minds are not yet limited by reality and their ideas are not yet tainted by what is and is not possible. Children might surprise designers with simple solutions to complex problems.

Druin (2002) described the four roles children can have in the design process, shown in Figure 23. As users, the children use existing products or technologies and their actions and behaviour will be observed. In the role of tester, children will use prototypes of products that are not yet on the market. When in the role of informant, children will be asked for verbal input. This can occur during various stages of the design process, based on when it is deemed helpful.

The last role children can fulfil is the role of design partner. In this role the child is an equal stakeholder in the creation of new products. Their creativity can be an important asset in the design process and their input should be taken seriously. Even though their abilities are not as advanced as professional (adult) designers, children have their own experiences and viewpoints to add. Children as design partners are part of the team.

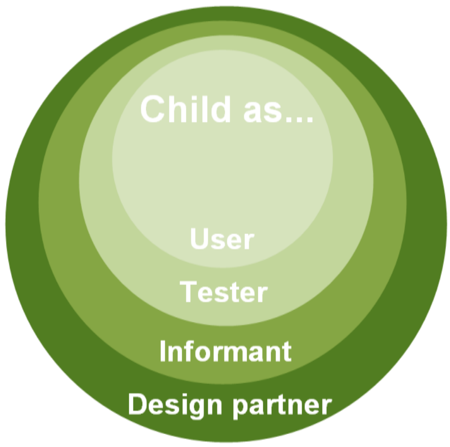

Figure 21 Four roles of children in design process.

At any given stage in a product development process, children's input can be useful. Young participants of a certain test are not limited to only one role, they can assume a hybrid role. For example children can voice their opinions and ideas when testing a prototype, thus assuming the role of both tester and informant.

Integration

Co-design with children is even trickier to integrate in a company than co-design with experienced, adult users. Employees that deal directly with the young designers need to be trained and prepared for the task, since there are some pitfalls.

In the role of user, tester or informant, children often do not get the chance to take a leading role in the discussion. Adults will always be in charge and will, sometimes unconsciously, steer the children in certain directions. This is not necessarily a bad thing, as children might get distracted or wander too far into the realms of technical impossibility, but it is very important that the designers leading the co-creating session are aware of the influence they have. Every time they shut down an idea, they risk shutting down a design trajectory that could have lead the process in a refreshing new direction. Training of employees should emphasise this influence and prepare them for the role of unbiased observer.

Naranjo-Bock (2012) describes a framework for co-creating with children, based on Druin's four roles. Before starting a co-design session with children, especially when they take the role of informant or design partner, a warm-up exercise should be performed. In these exercises, for example a simple brainstorm, the children get a chance to think about the design problem or analyse their interactions with certain products.

Some practical tips from Naranjo-Bock include:

- Conduct the sessions at the child's territory, for example at home or at school, to ensure an environment where children feel comfortable.
- Ensure a spacious room that offers easy access to the materials.
- Sessions should take up to one hour.
- Have a plan ready to deal with shyness, short attention spans and low motivation.
- Children aged 3 to 6 years old should preferably be accompanied by teachers or parents, who can translate their words, actions and creations.
- Children aged 7 to 11 years old are well suited for co-creation, as they are very expressive. Allow them to work with friends, since their energy can be transferable.

4.4 Conclusions

Co-creation with children offers many exciting possibilities, especially for a toy company. The sessions need to be carefully planned, give the participants the freedom to be imaginative and take into account their different viewpoint and experiences.

There are four main forms of co-creation, feedback sessions, brainstorm sessions, design workshops and customisation. A well-structured feedback session is the easiest to implement. It is important to have clear objectives and a test structure to fall back on. Before the start of the session, designers should be aware of all the details that interest them. The set-up of a customer panel is also recommended.

Design workshops entail actively inviting children to be part of the design process. They can function as an idea generation or an insight in children's preferences and experiences.

Customisation is an attractive option in the toy industry, especially in the arts and crafts market. When customers have the option to make a product their own they will feel more connected to the product and the brand. Easiest to implement is adaptive customisation, a standard product that the user can customise.

Definition of terms

Arts and crafts	The skills of making objects and an umbrella term for creative activities aimed to create an object or to decorate
Company X	Toy company and the client of this research
Licence	Licence to display popular characters on products in order to boost sales.

Abbreviations

A&C	Arts and crafts
CPSF	Consumer Product Safety Commission
NEN	Nederlands Normalisatie Instituut
SKU	Stock keeping unit
TIA	Toy Industry Association

DP	Drawing & Painting
Md	Modelling
Ms	Mosaics
FJ	Fashion & Jewellery
SS	Stamps & Stickers
N	Needlework
CS	Crafting Sets
Sp	Supplies

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Sources

Aina, O.E. & Cameron, P.A. (2011). Why Does Gender Matter? Counteracting Stereotypes With Young Children. *Dimensions of Early Childhood.* 39 (3) (pp. 11-19) Little Rock: Southern Early Childhood Association.

Appell, A. (2015) Trends from the Runway: New York Fall Fashion Week 2015. *Toy Industry Association.* [Online] 18th September. Available from: http://www.toyassociation.org/App_Themes/tia/pdfs/facts/trends/091815FashionWeek.pdf. [Accessed: 7th October 2015].

Bain & Company, Spaulding, E. & Perry, C. (2013) Making it personal: Rules for success in product customization. *Bain Insights.* [Online] 16th September. Available from: http://www.bain.com/publications/articles/making-it-personal-rules-for-success-in-product-customization.aspx. [Accessed: 10th November 2015].

Bart Smit (2015). *Toy catalogue.* [Online] Available from: http://www.bartsmit.com/nl/bsnl/content/Folders?gclid=CKfd0_CC-cgCFasEwwodBDQCaA [Accessed: 5th November 2015].

Belle, D. (1989). Gender differences in children's social networks and supports. In D. Belle (ed.), *Children's social networks and social supports* (pp. 173-188). New York: Wiley.

Benenson, J., Apostoleris, N. & Parnass, J. (1998). The organisation of children's same-sex peer relationships. In Bukowski, W.M., & Cillessen, A.H. (eds.) & Damon, W. (Series ed.), *New directions for child development: vol 80. Sociometry then and now: building on six decades of measuring children's experiences with the peer group.* (pp. 5-23). San Fransisco: Jossey-Bass.

Crayola LLC (2007). *Binney & Smith becomes Crayola LLC.* [Online] Available from: http://www.binney-smith.com/. [Accessed: 3rd November 2015].

Design Kit (2015). *Design tools for human-centred design.* [Online] Available from: http://www.designkit.org/methods/. [Accessed: 29th January 2016]

Druin, A. (2002). The Role of Children in the Design of New Technology. *Behaviour and Information Technology.* 21(1) (pp. 1-25) Oxford: Taylor & Francis.

Gilmore, J.H. & Pine, B.J. II. (1997). The Four Faces of Mass Customization. *Harvard Business Review.* 75(1) Watertown: Harvard Business Publishing.

Intertoys (2015). *Toy catalogue.* [Online] Available from: http://www.intertoys.nl/content/ folder. [Accessed: 5th November 2015].

Junior City (2015) *Observatoire des cours de récréation: Le Do It Yourself chez les 7-11 ans*. Ecully: Junior City

Kidspot. *Benefits of craft for kids.* [Online] Available from: http://www.kidspot.com.au/discoverycentre/Development-Development-Benefits-of-craft-for-kids+5382+553+article.htm. [Accessed: 5th October 2015].

Kogan, N. (1974). Creativity and sex differences. *Journal of Creative Behavior, 8 (1)* (pp. 1-14). New York: Wiley

Lowenfeld, V. & Brittain, W.L. (1947) *Creative and Mental Growth.* 4th Ed. (pp. 395-402) New York: The Macmillan Company.

Martin, C. & Ruble, D. (2004). Children's search for gender cues: Cognitive perspectives on gender development. *Current Directions in Psychological Science*, 13(2), (pp. 67-70) Thousand Oaks: Sage Publications.

Naranjo-Bock, C. (2012). *Co-designing with Children.* [Online] Available from: http://www.uxmatters.com/mt/archives/2012/04/co-designing-with-children.php. [Accessed: 2nd December 2015].

Nederlands Normalisatie Instituut (2002). *Nederlande Praktijkrichtlijnen NPR-CR14379: 2002.* Delft: NEN

Neuman, A. (2015). The Top Colors and Materials for 2016. *Toy Industry Association.* [Online] 21st August. Available from: http://www.toyassociation.org/App_Themes/tia/pdfs/facts/trends/082115NYNowtrends.pdf. [Accessed: 7th October 2015].

NPD Group. (2014). *2013 Review of the Global Toy Market.* [Online] Available from: http://www.toyassociation.org/App_Themes/tia/pdfs/facts/ToyMarkets13.pdf. [Accessed: 2nd November 2015].

Pahlevanian, A.A. & Ahmadizadeh, Z. (2014). Relationship Between Gender and Motor Skills in Preschoolers. *Middle East Journal of Rehabilitation and Health.* [Online] 1(1) Available from: http://mejrh.semums.ac.ir/?page=article&article_id=20843. [Accessed: 16th October 2015].

Parke, R. & Slaby, R (1983). The Development of Aggression. In P. Mussen (Ed.), *Handbook of Child Psychology.* 4 (pp. 547-621). New York: Wiley.

Prahalad, C.K. & Ramaswamy, V. (2000). Co-opting Customer Competence. *Harvard Business Review.* 78(1) Watertown: Harvard Business Publishing.

Reyner, M.A. *Arts, Crafts & Creativity in School-Age Child Care & Recreation.* [Online] Available from: http://www.earlychildhoodnews.com/earlychildhood/article_view.aspx?ArticleID=80%20. [Accessed: 5th October 2015].

Top1 Toys (2015). *Toy catalogue.* [Online] Available from: https://view.publitas.com/top1toys/het-grote-speelgoedboek/page/1. [Accessed: 5th November 2015].

Toy Industry Association. (2015). *Key Trends 2015.* [Online] Available from: http://www.toyassociation.org. [Accessed: 7th October 2015].

Toy Industry Association. (2003). *Century of Toys List.* [Online] Available from: http://www.thefreelibrary.com/Toy+Industry+Association+Announces+Its+%60%60Century+of+Toys+List''.096647851. [Accessed: 3rd November 2015].

U.S. Consumer Product Safety Commission (2002). *Age Determination Guidelines: Relating Children's Ages To Toy Characteristics and Play Behavior.* Bethesda: CPSC

Verleye, K. (2013). Ready for a co-creative economy? Implications of customer engagement in value creation for high-contact and technology-based service interfaces. University of Gent Press.

Web stores used in stock analysis:

http://www.bol.com
http://www.bartsmit.com
http://www.amazon.com
http://www.toysrus.com
http://www.fishpond.com
http://www.onlinetoys.com.au
http://www.flipkart.com

Images

Figure 1

Painting child. Available from: http://millikenchemical.com/childrens-art-products/. [Accessed: 26th November 2015].

Camera crafts. Available from: http://craftyscrappyhappy.net/how-to-take-high-quality-photos-that-will-sell-your-crafts/. [Accessed: 26th November 2015].

Figure 2a and 2b

Scribbling stage + Pre-schematic stage. (2013). Available from: http://blog.cmany.org/misc/toddler timeline/. [Accessed: 4th November 2015].

Figure 2c, 2d and 2e

Schematic stage, Transitional stage + Realism stage. Available from: https://2014mariaterceroeso.wordpress.com/drawing-development-children/. [Accessed: 4th November 2015].

Figure 3

Sesame Street Reward Stickers. Available from: http://www.fishpond.co.nz/Toys/Sesame-Street- Reward-Stickers-295-Stickers-Stickerland/9999108912240. [Accessed: 29th September 2015].

Crayola Washable Markers. Available from: http://www.crayola.ca/products/my-first-washable-markers-assorted-product/. [Accessed: 29th September 2015].

Lacing Beads. Available from: http://www.greenbeanlearning.co.za/catalogue-categories-fine-motor-blrbqr.html. [Accessed: 29th September 2015].

SES Creative Hammer Tic. Available from: http://ses-creative.com/en/ses-creative-hammer-tic-fantasy. [Accessed: 29th September 2015].

Goliath Super Sand. Available from: http://www.cdiscount.com/juniors/loisirs-creatifs-enfant/goliath-super-sand-castle/f-1209012-gol83219.html. [Accessed: 29th September 2015].

Children's Scissors. Available from: https://kidsmakingart.wordpress.com/ [Accessed: 17th February 2016].

Ravensburger Xoomy. Available from: http://www.intertoys.nl/schoolspullen/educatief-speelgoed/xoomy-1. [Accessed: 29th September 2015].

Sew Cool Sewing Machine. Available from: http://www.walmart.com/ip/Sew-Cool-Sewing-Machine-Bonus-Pack/38475309. [Accessed: 29th September 2015].

Beados Glitter Starterset. Available from: http://www.bot-i.com/product/beados-glitter-starterset-2/. [Accessed: 29th September 2015].

Cray-Z-Knitz Ultimate Design Station. Available from: http://cra-z-artshop.com/shimmer-n-sparkle/cra-z-knitz/cra-z-knitz-ultimate-design-station.html. [Accessed: 29th September 2015].

Tobar Candle Making Kit. Available from: http://www.tobar.co.uk/candle-making-kit. [Accessed: 29th September 2015].

Paint Brushes. Available from: http://www.rexart.com/lacorneillespecialwcbrushes.html [Accessed: 17th February 2016].

Daisy Stepping Stone Kit. Available from: http://midwestproducts.com/collections/stepping-stone-kits. [Accessed: 29th September 2015].

Needlework Set. Available from: http://www.amazon.com/AMAZING-Professional-Supplies-Leather-Back2Basics/dp/B013Z04HFA. [Accessed: 9th March 2016].

Copic Markers. Available from: http://www.amazon.com/Copic-Marker-12-Piece-Sketch-Basic/dp/B000MRR3GU. [Accessed: 9th March 2016].

Figure 5

Paint brushes. Available from: http://myartscape.org/brushcare/ [Accessed: 23rd February 2016].

Modelling Clay. Available from: http://imgbuddy.com/molding-clay-clipart.asp [Accessed: 17th February 2016].

Mosaic. Available from: http://www.mozaiekcirkel.nl/ [Accessed: 23rd February 2016].
Beads. Available from: http://www.dailymail.co.uk/health/article-2561540/Tiny-beads-injected-blood stream-stop-heart-attack-scarring.html [Accessed: 23rd February 2016].
Stickers. Available from: http://www.dhgate.com/product/200-sheets-mixed-kids-cute-stickers-children/155281887.html [Accessed: 23rd February 2016].
Thread. Available from: http://orangellow.com/index.php/thread/ [Accessed: 23rd February 2016].
DIY. Available from: https://betterbusinesslodging.com/do-it-yourself/ [Accessed: 23rd February 2016].
Coloured paper. Available from: https://www.eckersleys.com.au/products/jasart-creativity-paper [Accessed: 23rd February 2016].
Crayola logo. Available from: https://en.wikipedia.org/wiki/Crayola [Accessed: 3rd November 2015].
Roseart logo. Available from: http://logos.wikia.com/wiki/RoseArt [Accessed: 23rd February 2016].
Ravensburger logo. Available from: https://www.ravensburger.com/ [Accessed: 23rd February 2016].
Play-Doh logo. Available from: http://playdoh.hasbro.com/en-us [Accessed: 3rd November 2015].
SuperSand logo. Available from: http://www.goliathtoys.de/spiele/super-sand/ [Accessed: 23rd February 2016].
Perler beads logo. Available from: http://www.strijkkralenwinkel.nl/strijkkralen-winkel/merken-strijk kralen [Accessed: 23rd February 2016].
Hama logo. Available from: http://www.strijkkralenwinkel.nl/strijkkralen-winkel/merken-strijkkralen [Accessed: 23rd February 2016].
Beados logo. Available from: http://shopkinsworld.wikia.com/wiki/File:Beados_Logo.png [Accessed: 23rd February 2016].
TopModel logo. Available from: http://www.surpriseshop.be/pagina11.html[Accessed: 23rd February 2016].
Rainbow Loom logo. Available from: https://www.rainbowloom.com/ [Accessed: 23rd February 2016].
Sew Cool logo. Available from: http://www.coolmaker.com/sewcool/projects.php?loc=us [Accessed: 23rd February 2016].
Cra-Z-Art logo. Available from: http://www.cra-z-art.com/ [Accessed: 23rd February 2016].
SES logo. http://www.strijkkralenwinkel.nl/strijkkralen-winkel/merken-strijkkralen[Accessed: 23rd February 2016].
Melissa & Doug logo. Available from: https://en.wikipedia.org/wiki/File:Melissa_%26_Doug_logo.svg [Accessed: 23rd February 2016].
Alex Toys logo. Available from: http://hiptot.com/2047-2/alex_16_w_grommets-2/ [Accessed: 23rd February 2016].

Figure 7

Frozen Blo pens. Available from: http://www.bol.com/nl/p/blopens-activity-set-frozen-blaasstiften-kleu ren/9200000040848477/. [Accessed 5th November 2015].
Crayola washable Crayons. Available from: http://www.amazon.com/Crayola-Washable-Crayons-52-6924-3-Pack/dp/B0033LWTL6/ref=sr_1_2?s=toys-andgames&ie=UTF8&qid=1446737256&sr=1-2. [Accessed: 5th November 2015].
Crayola Light Designers. Available from: http://www.toysrus.com/product/index.jsp?productId=51449386&cp=2255956.2273442.3999911.3999915&parentPage=family. [Accessed: 5th November 2015].
3D art. Available from: https://www.onlinetoys.com.au/4m-3d-art-creative-spiral- fun.html. [Accessed: 5th November 2015].

Figure 11

Price categories. Available from: https://www.bol.com/nl/l/speelgoed/hobby-creatief-knutselen-voor-kinderen/N/19440/weergave/tegels_3/index.html [Accessed: 16th January 2016].

Figure 12

Alex Button Art. Available from: http://www.alextoys.com/product/button-art/. [Accessed: 29th September 2015].

Play-Doh Case of Colors. Available from: http://playdoh.hasbro.com/en-us/product/play-doh-case-of-colors:87645A51-5056-900B-10DB-1D99E6DEE180. [Accessed: 29th September 2015].

Fashion Design Studio. Available from: http://www.amazon.com/You-Fashion-Studio-1252Design/dp/B000QY696E. [Accessed: 29th September 2015].

Alex Pottery Wheel. Available from: http://www.alextoys.com/product/deluxe-pottery-wheel/. [Accessed: 29th September 2015].

Style me up! Charm Bracelets Kit. Available from: http://www.walmart.com/ip/Style-Me-Up-Charm-Bracelet-Kit/35651023. [Accessed: 29th September 2015].

Fashion Angels Sketch Portfolio. Available from: http://www.fashionangels.com/fashionangels/art-drawing/fashion-portfolios/fashion-design-sketch-portfolio.html. [Accessed: 29th September 2015].

Barbie Sketch Portfolio. Available from: http://www.amazon.com/Barbie-Finishing-Touches-Portfolio-Official/dp/B00WNFHGUM. [Accessed: 29th September 2015]

Some images in Figure 12 have been used in Figure 3 as well and are sourced accordingly.

Figure 13

Minions logo. Available from: http://despicableme.wikia.com/wiki/File:Minions-movie-logo.png. [Accessed: 20th January 2016].

Disney Frozen logo. Available from: http://logos.wikia.com/wiki/File:Frozen-logo.gif. [Accessed: 3rd November 2015].

Figure 15

Urlas, C. (2013). *Rainbow Looms Bracelets for Sale.* Available from: https://www.flickr.com/photos/shoppingdiva/11011252914/in/photostream/. [Accessed: 2nd November 2015].

Figure 19

Co-design workshops in practice. Available from:
https://www.linkedin.com/pulse/20140530181242-144684-co-creation-methods-approaches
http://incubio.com/cohybridization-workshop/#.VtREQvkrLRY
http://co-creating-cultures.com/cat/
http://cargocollective.com/aysegokcebor/Knytt
http://www.futureproofed.com/en/what_we_do/consultancy
[Accessed: 29th February 2016].

Figure 20

Gilmore, J.H. & Pine, B.J. II. (1997). In Smits, H. (ed). The Four Faces of Mass Customization. *Harvard Business Review.* 75(1) Watertown: Harvard Business Publishing.

Figure 21

Druin, A. (2002). In Smits, H. (ed). The Role of Children in the Design of New Technology. *Behaviour and Information Technology.* 21(1) (pp. 1-25) Oxford: Taylor & Francis.

All other images are created by the author of this report for this research specifically.

Appendices

Appendix A: Market distribution - Based stock of web stores

Categories	Bol	%	Bart Smit	%	Amazon	%	Toys R US	%	Fish-pond	%	Online-toys	%	Flipkart	%	Total %	Average %
Drawing & Painting	2204	29.0	374	47.0	48023	33.4	1101	46.2	25675	27.4	724	43.2	300	14.9	241.1	34.4
Modelling	523	6.9	70	8.8	4101	2.9	253	10.6	2621	2.8	105	6.3	440	21.8	60.1	8.6
Mosaics	577	7.6	147	18.5	1232	0.9	71	3.0	726	0.8	29	1.7	152	7.5	40.0	5.7
Fashion & Jewellery	1284	16.9	64	8.1	8121	5.6	467	19.6	14705	15.7	193	11.5	325	16.1	93.5	13.4
Stamps & Stickers	346	4.6	83	10.4	71624	49.8	81	3.4	24370	26.0	280	16.7	208	10.3	121.2	17.3
Needlework	110	1.5	10	1.3	1272	0.9	112	4.7	9987	10.7	36	2.2	89	4.43	25.5	3.6
Crafting Sets	1737	22.9	32	4.0	6496	4.5	100	4.2	514	0.5	285	17.0	500	24.8	78.0	11.1
Supplies	816	10.7	15	1.9	3003	2.1	199	8.3	15132	16.1	26	1.6	0	0	40.8	5.8
Total	7597	100	795	100	143872	100	2384	100	93730	100	1678	100	2014	100	700	100

Table A1 Market distribution of A&C category

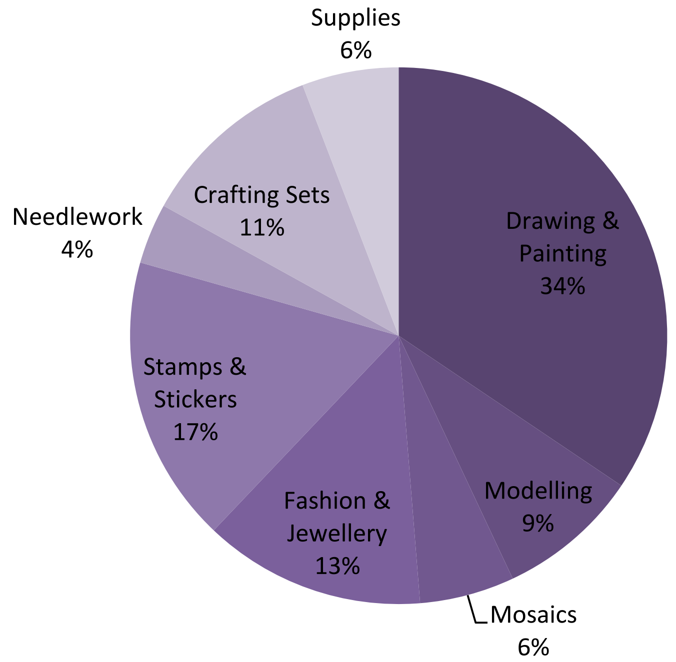


Figure A1 Market distribution of A&C categories

Appendix B: Best selling products - Based stock of web stores, sorted by category

Categories	Bol	Bart Smit	Amazon[3]	Toys R Us	Fishpond	Online-toys	Flipkart	Total NL	%
Drawing & Painting	43	45	45	41	48	46	15	283	40.4
Modelling	32	21	11	20	3	18	12	117	16.7
Mosaics	4	7	8	3	3	3	-	28	4.0
Fashion & Jewellery	6	8	11	13	8	8	27	81	11.6
Stamps & Stickers	5	9	7	8	14	6	1	50	7.1
Needlework	-	6	3	7	9	4	8	37	5.3
Crafting Sets	7	2	5	5	7	12	33	71	10.1
Supplies	3	2	10	3	8	3	4	33	4.7
Total	100	100	100	100	100	100	100	700	100

Table B1 Bestselling products sorted by A&C category

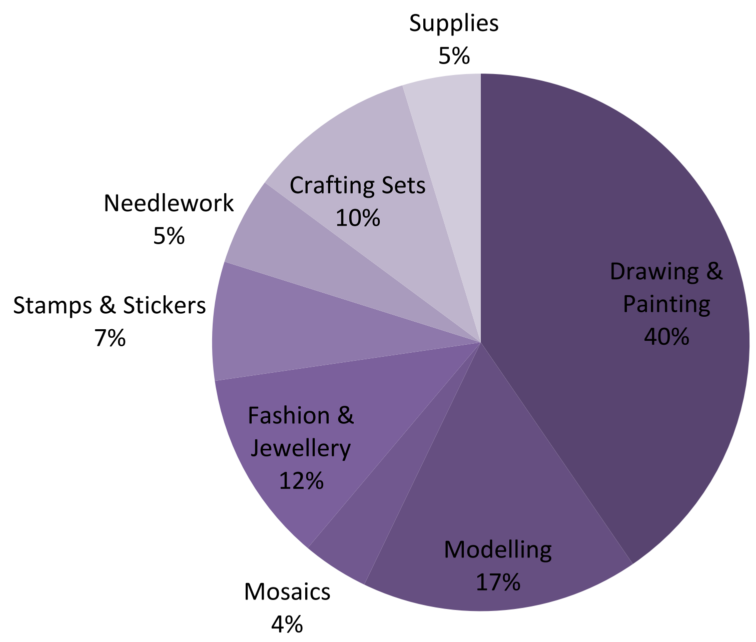


Figure B1 Bestselling products sorted by A&C category

[3] Based on average customer review. Products with <500 reviews were disregarded.

Appendix C: Price - Based stock of web stores

Price Bestsellers	Bol (€)	Bart Smit (€)	Toys R Us ($)	Amazon ($)	Fishpond (€)	Total	%
<10	41	57	40	51	35	224	44.8
10-20	39	26	32	31	34	162	32.4
20-40	17	17	23	12	28	97	19.4
>40	3	-	5	6	3	17	3.4
Total	100	100	100	100	100	500	100

Table C1 Bestselling products sorted by price category

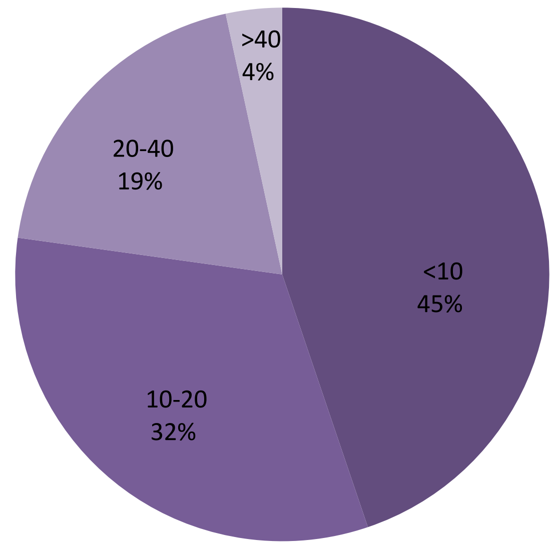


Figure C1 Bestselling products sorted by price category

Price A&C	Bol (€)	%	Bart Smit (€)	%	Toys R Us ($)	%	Amazon ($)	%	Total %	%
<10	2792	39.5	445	61.9	964	37.8	63821	48.1	187.4	46.8
10-20	2705	38.3	175	24.3	1112	43.7	35471	26.7	133.0	33.3
20-40	1092	15.5	76	10.6	353	13.9	19554	14.7	54.6	13.7
>40	477	6.8	23	3.2	118	4.6	13843	10.4	25.0	6.3
Total	7066	100	719	100	2547	100	132689	100	400	100

Table C2 All arts and crafts products sorted by price category

Price Toys	Bol[4] (€)	%	Bart Smit (€)	%	Toys R Us ($)	%	Amazon ($)	%	Total %	%
<10	5307	14.1	4963	31.1	9885	25.2	1104687	22.0	92.5	23.1
10-20	13373	35.6	5277	33.1	14397	36.7	1026319	20.5	125.8	31.5
20-40	11591	30.8	2885	18.1	8404	21.4	1464174	29.2	99.6	24.9
>40	7307	19.4	2825	17.7	6542	16.7	1417763	28.3	82.1	20.5
Total	37578	100	15950	100	39228	100	5012943	100	400	100

Table C3 All toys sorted by price category

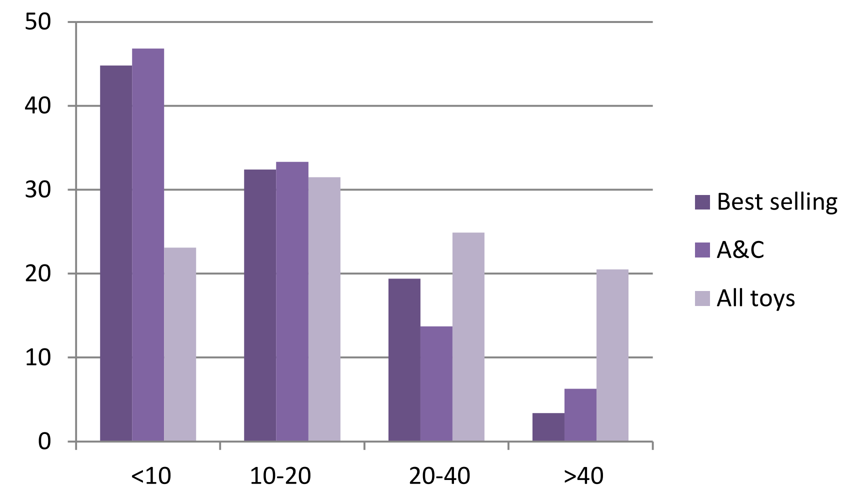


Figure C2 Bestselling products, all A&C and all toys sorted by price category

4 Based on gift recommendations instead of total assortment

Appendix C: Price - Per category; based on stock of web stores

Bol	DP	%	Md	%	Ms	%	FJ	%	SS	%	N	%	CS	%	Sp	%
<10	887	29.2	151	26.4	188	39.5	499	55.6	342	67.3	26	15.3	534	25.8	630	64.9
10-20	1283	42.3	269	47.0	188	39.5	311	34.7	138	27.2	42	24.7	962	46.5	254	26.2
20-40	549	18.1	132	23.1	70	14.7	75	8.4	17	3.3	53	31.2	444	21.5	52	5.4
>40	315	10.4	20	3.5	30	6.3	12	1.3	11	2.2	49	28.8	127	6.1	34	3.5
Bart Smit	**DP**	%	**Md**	%	**Ms**	%	**FJ**	%	**SS**	%	**N**	%	**CS**	%	**Sp**	%
<10	177	47.3	47	67.1	97	66.0	45	70.3	38	45.8	0	0.0	27	84.4	11	73.3
10-20	123	32.9	17	24.3	24	16.3	15	23.4	21	25.3	9	90.0	4	12.5	3	20.0
20-40	66	17.6	6	8.6	11	7.5	4	6.3	7	8.4	1	10.0	1	3.1	1	6.7
>40	8	2.1	0	0.0	15	10.2	0	0.0	17	20.5	0	0.0	0	0.0	0	0.0
Amazon	**DP**	%	**Md**	%	**Ms**	%	**FJ**	%	**SS**	%	**N**	%	**CS**	%	**Sp**	%
<10	5108	49.4	480	41.0	90	30.0	643	57.3	5704	68.4	1179	48.9	1690	38.7	912	48.3
10-20	3268	31.6	432	36.9	136	45.3	312	27.8	2055	24.7	851	35.3	1674	38.4	598	31.7
20-40	1509	14.6	184	15.7	59	19.7	132	11.8	506	6.1	326	13.5	757	17.3	275	14.6
>40	458	4.4	75	6.4	15	5.0	36	3.2	71	0.9	53	2.2	244	5.6	104	5.5
Toys R Us	**DP**	%	**Md**	%	**Ms**	%	**FJ**	%	**SS**	%	**N**	%	**CS**	%	**Sp**	%
<10	505	45.9	105	41.5	14	19.7	151	32.3	34	42.0	41	36.6	12	12.0	21	10.6
10-20	400	36.3	112	44.3	39	54.9	247	52.9	42	51.9	57	50.9	52	52.0	85	42.7
20-40	139	12.6	33	13.0	6	8.5	66	14.1	4	4.9	13	11.6	33	33.0	38	19.1
>40	57	5.2	3	1.2	12	16.9	3	0.6	1	1.2	1	0.9	3	3.0	55	27.6

Total	DP Total %	DP %	Md Total %	Md %	Ms Total %	Ms %	FJ Total %	FJ %	SS Total %	SS %	N Total %	N %	CS Total %	CS %	Sp Total %	Sp %
<10	171.8	43.0	176.0	44.0	155.2	38.8	215.5	53.9	223.5	55.9	100.8	25.2	160.9	40.2	197.1	49.3
10-20	143.1	35.8	152.5	38.1	156.1	39.0	138.8	34.7	129.0	32.2	200.9	50.2	149.4	37.3	120.6	30.1
20-40	63.0	15.7	60.4	15.1	50.3	12.6	40.5	10.1	22.8	5.7	66.3	16.6	74.9	18.7	45.7	11.4
>40	22.1	5.5	11.1	2.8	38.4	9.6	5.2	1.3	24.7	6.2	31.9	8.0	14.7	3.7	36.6	9.2
	400	100	400	100	400	100	400	100	400	100	400	100	400	100	400	100

Table C4 Stock sorted by A&C category and price category

Figure C3 Stock sorted by A&C category and price category

Appendix D: Examples of product packaging - Based on age of target group and product category

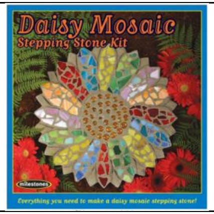
Age	< 2	3 - 5	6 - 8	9 - 11	> 12
Drawing & Painting					
Modelling					
Mosaics			 		
Fashion & Jewellery					
Stamps & Stickers					
Crafting Sets					
Needlework					
Crafting Supplies					

Table D1 Packaging examples

Appendix E: Licences

Categories	Bol	%	Amazon	%	Toys R Us	%	Fish-pond	%	Total	%
Drawing & Painting	6	27.3	395	77.5	8	53.3	143	75.7	233.7	58.4
Modelling	3	13.6	15	2.9	3	20.0	14	7.4	44.0	11.0
Mosaics	1	4.5	16	3.1	-	0.0	1	0.5	8.2	2.1
Fashion & Jewellery	-	0.0	-	0.0	-	0.0	-	0.0	0.0	0.0
Stamps & Stickers	8	36.4	58	11.4	2	13.3	25	13.2	74.3	18.6
Needlework	-	0.0	-	0.0	-	0.0	-	0.0	0.0	0.0
Crafting Sets	3	13.6	6	1.2	2	13.3	-	0.0	28.1	7.0
Supplies	1	4.5	20	3.9	-	0.0	6	3.2	11.6	2.9
Total	22	100	510	100	15	100	189	100	400	100

Table E1 Licensed Minions arts and crafts product sorted by product category

Categories	Bol	%	Amazon	%	Toys R Us	%	Fish-pond	%	Total	%
Drawing & Painting	53	76.8	416	48.8	14	43.8	237	51.5	220.9	55.2
Modelling	1	1.4	14	1.6	2	6.3	9	2.0	11.3	2.8
Mosaics	1	1.4	14	1.6	3	9.4	9	2.0	14.4	3.6
Fashion & Jewellery	4	5.8	63	7.4	5	15.6	85	18.5	47.3	11.8
Stamps & Stickers	5	7.2	273	32.0	3	9.4	84	18.3	66.9	16.7
Needlework	-	0.0	2	0.2	1	3.1	13	2.8	6.2	1.5
Crafting Sets	5	7.2	42	4.9	3	9.4	12	2.6	24.2	6.0
Supplies	-	0.0	29	3.4	1	3.1	11	2.4	8.9	2.2
Total	69	100	853	100	32	100	460	100	400	100

Table E2 Licensed Frozen arts and crafts product sorted by product category

Minions and Frozen	%
113.6	56.8
13.8	6.9
5.7	2.8
11.8	5.9
35.3	17.6
1.5	0.8
13.1	6.5
5.1	2.6
200	100

Table E3 Licensed arts and crafts product sorted by product category

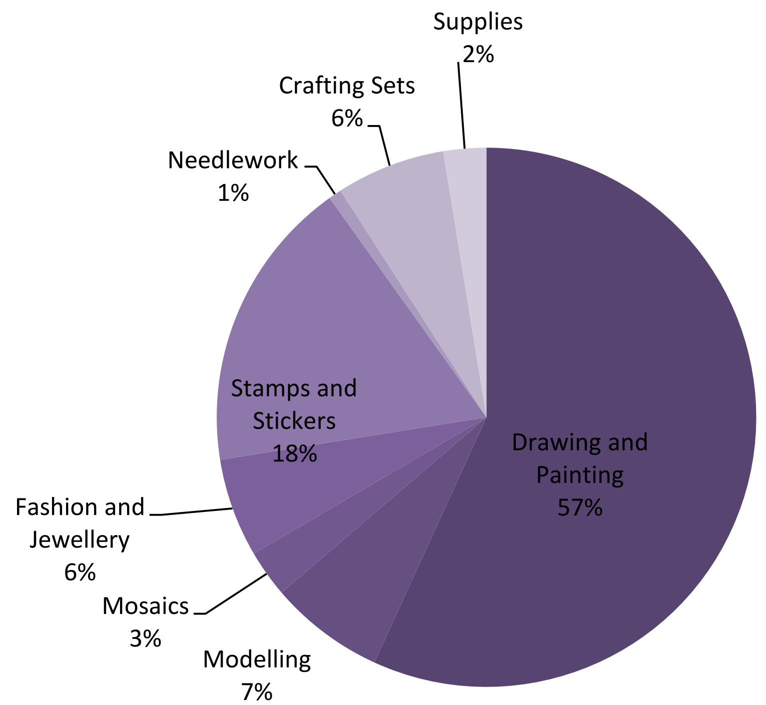


Figure E1 Licensed arts and crafts product sorted by product category

Appendix F: Results interview employees - Toy stores

Questions

1. How many years of experience do you have in toy sales?
2. Can you show some of the bestsellers in your arts and crafts assortment?
3. Are these products hypes or have they been consistent in their sales?
4. Can you show me some hype products?
5. Can you show me relatively new products in your assortment?
6. Are there differences in products for boys and girls?
7. Do parents usually instigate the buy or children?
8. Do you notice a pattern or similarities in the people that buy arts and crafts products?
9. How do you arrange the products on the shelves? Is there a specific order?
10. Can you rate the impact on sales of the following variables on a scale of 1-5?
    - Advertorials
    - Licences
    - Educational value
    - Price
    - Ease of use
    - Messiness
    - End Product
    - Endurance of the End Product
11. Can you name any more variable that can have an impact on the popularity of a product?

*10	*value*	Bart Smit Enschede	Intertoys Panningen	Top1Toys Venlo	Intertoys Venlo	Intertoys Tilburg
	Advertorials	5	5	5	5	5
	Licences	5	5	4	5	3
	Educational value	3	5	4	5	3
	Price	4	5	3	5	2
	Ease of use	4	3	3	4	4
	Messiness	2	3	1	2	1
	End product	2	3	4	4	3
	Endurance	1	2	2	3	1

Continuation Table F1 Results interviews employees toy stores

Results

	Bart Smit Enschede	Intertoys Panningen	Top1Toys Venlo	Intertoys Venlo	Intertoys Tilburg
1	3 years	11 years	4,5 years	35 years	16 years
2	Play-Doh, HAMA beads, Mandala designers, SES products	Painting by numbers, Top model sets, Frozen art sets.	Play-Doh, drawing sets.	Super Sand, Play-Doh	Play-Doh, SES, fashion designer sets.
3	The section has many staple brands that sell well, but there is a great use of tv characters.	There are hypes, but usually A&C sells year round.	Very consistent.	Hypes are certainly a thing, but not that often in A&C. There are a lot of different tv hypes though.	These brands have been around for years, but they do come out with new products.
4	Loom bands.	Frozen, we have a lot of themed drawing products.	BLOpens, maybe, they do really well lately.	Loom bands.	Loom bands, but that was last year.
5	We do not really have brand new products.	I guess the Frozen sets are relatively new.	BLOpens	DohVinci, the drawing clay and the Sew Cool sewing machines.	We have been selling a lot of the new DohVinci sets.
6	More girls want A&C products. There is a wider range for them (FH&J WK&E)	Mostly for girls, boys products are more boy-themed, like dinosaurs, but A&C are genderless.	Most A&C products are sold for girls, even if it is not specifically marketed towards them.	Yes, there are many 'girly' products, like fashion designers. Boys not so much.	A&C in general is for both boys and girls, but girls are better suited to focus on such detailed activities.
7	Parents may be extra motivated to buy A&C products, but not if their children have no interest.	Often children ask for it, but obviously parents buy the product.	I really can't tell, since parents always buy them.	Children are more likely to 'beg' their parents for other products, but it's not like they don't want them.	They are popular St. Nicks products, so maybe the parents want to nudge the children.
8	No, A&C is a very universal activity.	It is often a choice for grandparents, because they recognize the more traditional toys.	No, all kinds of people come here.	No, not really.	Maybe A&C is more popular with intellectual parents to stimulate development, but I really would not know.
9	I do not know, I think it is just random.	We try to sort our products by category, like modelling and drawing.	Sorted by brand	Sorted by activity, for example we have painting supplies separate from modelling clay.	Sorted by activity.
10	*				
11	Endurance of the product itself (sturdiness)	Collectability, how long it can captivate the child.		Imagination (simple products stimulate imagination)	

Table F1 Results interviews employees toy stores

Appendix F: Results interview employees - Hobby stores

Questions

1. How many years of experience do you have in craft sales?
2. Do you get a lot of children in your store?
3. Can you show some of the bestsellers for children?
4. Are these products hypes or have they been consistent in their sales?
5. Are there differences in products for boys and girls?
6. Do parents usually instigate the buy or children?
7. Do you notice a pattern or similarities in the people that buy arts and crafts products?
8. How do you arrange the products on the shelves? Is there a specific order?
9. Can you rate the impact on sales of the following variables on a scale of 1-5?
   - Advertorials
   - Licence
   - Educational value
   - Price
   - Ease of use
   - Messiness
   - End Product
   - Endurance of the End Product
10. Can you name any more variables that can have an impact on the popularity of a product?

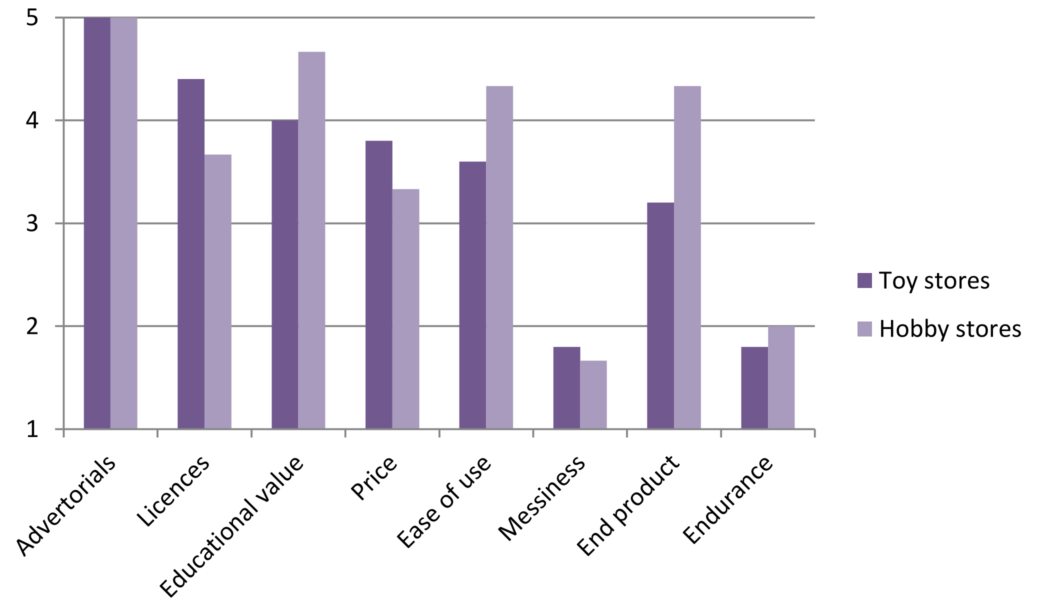


Figure F1 Cause of popularity toys according to sales employees

Results

	Bertus Workel Enschede	Pipoos Venlo	Nellie Snellen Sevenum
1	8 years	2,5 years	25 years
2	Yes, most certain, especially in the dress-up department.	Yes, although many are here because their parents love craftingt.	Yes, children of all ages love to craft. But as they get older (12+) they need to take a special interest in it to come here.
3	Beads, making bracelets is always popular.	Lots of fluffy products, pipe cleaners for example. And glitters!	We have a young artist line, that simplifies some crafts for children. They do very well, you buy a complete set.
4	There are certainly hypes, but the materials are always in our assortment.	Consistent, we sell products to people that already have an interest in art, so it is not fickle.	Most products have consistent sales, but lately younger girls are taking up knitting.
5	A&C is genderless, although Needlework is traditionally more girly, as well as glittery products.	Not really, we only sell materials. Maybe the glitters are more girly.	A&C products are for everyone, but girls ask for them more often.
6	Parents, they buy specific materials for projects they are working on with the children.	Children often do not immediately see the possibilities, so parents pick out the materials.	Mostly parents or older children.
7	Mostly creative people, sometimes the eccentric type. I guess these are the parents that encourage A&C in their children.	We are a specialist store, so only people with an interest in A&C come here. Often people with a bit more to spend.	Oh no, all sorts of people come here. They really are unique.
8	We sort the products per category.	Sorted by category.	Well, yeah by art form mostly. There is, apart from the young artist line, not a specific children's section though.
9	*		
10			

Table F2 Results interviews employees hobby stores

*9	*value*	Bertus Workel Enschede	Pipoos Venlo	Nellie Snellen Sevenum
	Advertorials	5	5	5
	Licences	4	3	4
	Educational value	5	4	5
	Price	4	3	3
	Ease of use	4	5	4
	Messiness	1	3	1
	End product	5	4	4
	Endurance	3	2	1

Continuation Table F2 Results interviews employees hobby stores

Appendix G: Survey parents - Questions and results

The results are in grey, depicting how many times an answer was given.

1. What is your gender?

Male	5
Female	71

2. How many children do you have?

	0	1	2	3	4	5	6	Total
Boys	17	31	21	5	2	0	0	96
Girls	22	37	15	2	0	0	0	73
Total	0	15	41	11	7	1	1	169

3. What is the age range of your children?

Used to disregard parents with children that have long left the target group (0-12 years), but otherwise irrelevant.

4. What is your highest level of education?

WO (University)	9
HBO (College)	39
MBO (Apprenticeships)	21
VO (Secondary education)	6
BO (Primary education)	1

5. How often are your children participating in the following activities?

	(1) Never	(2) Rarely	(3) Sometimes	(4) Often	(5) Very often	Average
Board games	3	3	36	27	7	3,4
Construction	3	3	11	38	21	3,9
Puzzles	3	14	26	24	9	3,3
Arts and crafts	1	3	15	36	21	4,0
Outside play	0	1	19	33	23	4,0
Media	2	6	21	39	8	3,6
Fantasy play	3	8	13	42	10	3,6

Table G1 Time spent on play activities by children

6. How often do you wish your children participated in these activities?

	(1) Never	(2) Rarely	(3) Sometimes	(4) Often	(5) Very often	Average
Board games	0	2	27	41	6	3,7
Construction	1	4	9	44	18	4,0
Puzzles	0	0	28	41	7	3,7
Arts and crafts	0	0	10	48	18	4,1
Outside play	0	0	5	35	36	4,4
Media	3	22	41	9	1	2,8
Fantasy play	1	4	9	50	12	3,9

Table G2 Ideal time spent on play activities according to parents

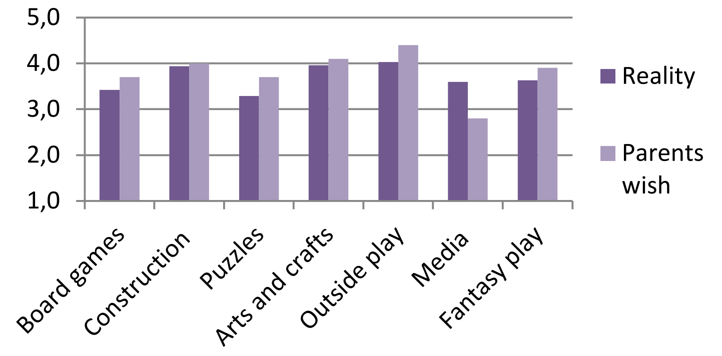


Figure G1 Reality vs. Parents wish of time spent on play activities

7. Are there any other activities or products that your children play with on a regular basis?

-Sports	-Dancing
-Card games	-Cooking
-Reading	-Making music

8. How often do your children participate in the following arts and crafts activities?

	(1) Never	(2) Rarely	(3) Some-times	(4) Often	(5) Very often	Average
Drawing and colouring	2	2	13	31	28	4,1
Painting	4	11	31	24	6	3,2
Modelling clay	8	11	33	18	6	3,0
Cutting and pasting	6	7	25	28	10	3,4
Stamps & Stickers	9	8	30	22	7	3,1
Fashion activities	31	14	16	11	4	2,3
Jewellery making	26	21	21	6	2	2,2
Needlework	35	20	12	9	0	1,9
Mosaics	18	18	20	17	3	2,6

Table G3 Time spent on arts and crafts activities

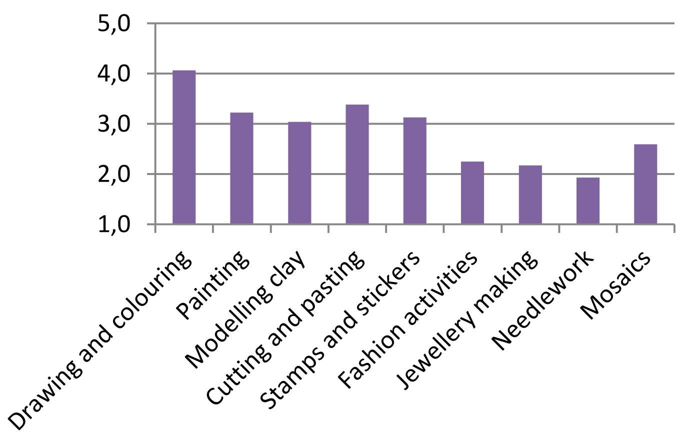


Figure G2 Time spent on arts and crafts activities

9. Are there any other arts and crafts activities that your children do on a regular basis?

-Pricking	*-Folding*
-Writing	*-Miniature modelling*
-Casting	*-Woodworking*

Appendix G: Survey parents - Questions and results

10. Do your children propose arts and crafts activity themselves?

Yes, my children often propose arts and crafts activities	51
Yes, but not often or only when there is nothing else to do	10
No, I propose the activity, but my children are enthusiastic	12
No, my children usually do not enjoy those activities	3

11. How many hours per week are your children doing arts crafts activities at home?

0-2 hours	28
2-5 hours	25
5-10 hours	18
10-15 hours	3
>15 hours	2

12. How many hours per week are your children doing arts and crafts activities at another location?

0-2 hours	41
2-5 hours	24
5-10 hours	9
10-15 hours	2
>15 hours	0

13. Do you encourage your children to participate in creative activities?

Yes, I encourage my children actively to be creative	40
Yes, I encourage my children moderately to be creative	21
No, I let my children choose their own activities	15
No, I discourage my children to be creative	0

14. Why do or don't you think it is important to that your children participate in creative activities.

-Stimulate creative thinking
-It is a good outlet
-Stimulate fantasy
-Stimulate motor skills
-Stimulate concentration
-Relaxation for children
-Stimulate problem solving skills
-Stimulate spatial awareness
-Discovering materials and techniques
-Children enjoy it

15. How often do you participate in arts and crafts activities with your children?

I usually craft with my children when they are crafting	29
I sometimes craft with my children when they are crafting	36
I usually let my children craft on their own	11

16. To what extent do you let your children choose their own toy?

I decide which toys they get	4
I decide which toys they get, but consider their wishes	24
I decide which toys they get, but their wishes are important	35
Usually I let my children choose their own toys.	13

17. Did you buy extra toys for your children in the December month?

Used as guidance for participants to answer the next questions, but otherwise irrelevant.

18. How many of all the toys you buy for your children are arts and crafts toys?

0-5%	13
5-10%	15
10-20%	15
20-40%	21
40-60%	11
60-100%	1

19. How much of the total toy budget is spent on arts and crafts toys?

0-5%	18
5-10%	13
10-20%	18
20-40%	18
40-60%	8
60-100%	1

20. Can you give some examples of arts and crafts toys that you gave your children?

A large variety of answers was given, ranging over all A&C categories.

21. What is the influence of the following aspects on your decision to buy certain arts and crafts products?

	(1) No influence	(2) Little influence	(3) Noticeable influence	(4) Big influence	(5) Very big influence	Average
Price	2	11	36	22	5	3.2
Quality	1	3	28	37	7	3.5
Educational value	3	9	34	26	4	3.2
Wishes of child	3	-	27	28	18	3.5
Advertorials	18	36	15	6	1	2.1
Themes	15	28	21	7	5	2.4
Hassle for parent	10	34	19	11	2	2.5
Creative stimulus	2	5	27	37	5	3.4
Recommended by other parents	9	20	26	18	3	2.8
Seen at school	14	20	28	14	0	2.6
Quality of end result	8	15	32	17	4	2.9

Table G4 Influence on decision to buy products

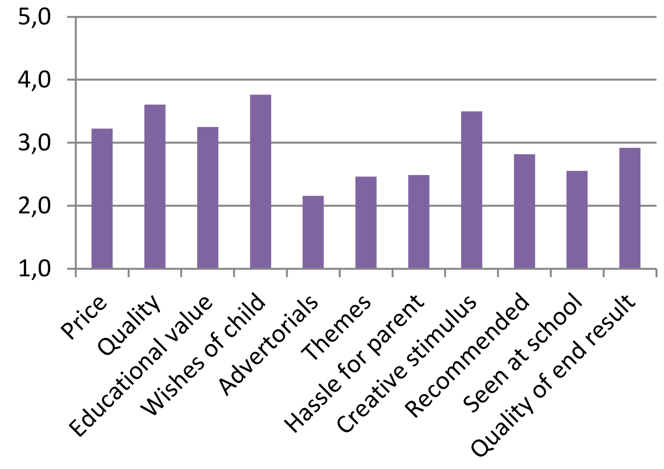


Figure G3 Influence on decision to buy products.

22. Are there any other aspects that influence your choice?

-Skill level required
-Time it takes to finish the project
-Aesthetic of the product
-Safety
-Fun it brings children
-Availability in local stores
-Not too girly (for boys)
-Girly (for girls)
-Multi purposed
-Personally tested
-Recommended by other children

Sources Appendices

Figure C1

Crayola Pop-squeaks Skinnies Washable Markers. Available from: http://www.dickblick.com/products /crayola-pip-squeaks-skinnies-washable-markers/. [Accessed: 29th September 2015].

Ravensburger Aquarelle. Available from: http://www.hamleys.com/ravensburgeraquarelle-world-cities-painting-kit-large.ir. [Accessed: 29th September 2015].

Paint Brush Set. Available from: http://www.amazon.com/CubeCraft-15-Piece-Watercolor-Acrylics-Painting/dp/B00XHSJJM2/ref=sr_1_7?s=artscrafts&ie=UTF8&qid=14575292 22&sr=1-7. [Accessed: 9th March 2016].

Play-Doh Case of Colors. Available from: http://playdoh.hasbro.com/en-us/product/play-doh-case-of-colors:87645A51-5056-900B-10DB-1D99E6DEE180. [Accessed: 29th September 2015].

Doh Vinci Deluxe Styler. Available from: http://www.hasbro.com/en-us/product/dohvinci- deluxe-styler: 8E4BEB24-5056-9047-F508-4BF28C0828F2. [Accessed: 29th September 2015]

Discovery Kids Pottery Wheel. Available from: http://www.amazon.com/Discovery-Kids- Motorized-Pot tery-Wheel/dp/B00A2WW496. [Accessed: 29th September 2015].

Alex Button Art. Available from: http://www.alextoys.com/product/button-art/. [Accessed: 29th September 2015].

Perler Beads Multi-Mix Colors. Available from: http://www.amazon .com/Perler-Beads-Count-Multi-Mix-Colors/dp/B000ZDME7Y. [Accessed: 29th September 2015].

Mazichands Bracelet Maker Kit. Available from: http://www.amazon.com/Arts-Crafts-For- Girls-Friend ship/dp/B00GJXICV6. [Accessed: 29th September 2015].

Fashion Angels Design Sketch Portfolio. Available from: http://www.fashionangels.com/ fashionangels /art-drawing/fashion-portfolios/fashion-design-sketch-portfolio.html. [Accessed: 29th September 2015].

Fashion Design Studio. Available from: http://www.amazon.com/You-Fashion-Studio-1252-Design/ dp/B000QY696E. [Accessed: 29th September 2015].

Assorted Alphabet Stamps. Available from: http://artfulldelight.blogspot.nl/2009/05/stem- pelen.html [Accessed: 17th February 2016].

PlayMais Bucket. Available from: http://zephyrtoys.com/products/playmais-bucket-1000-pcs. [Accessed: 29th September 2015].

4M Make A Wind Chime Kit. Available from: http://www.amazon.com/4M-Make-Wind-Chime-Kit/dp/ B000J3ZVMK. [Accessed: 29th September 2015].

Breikoffertje. Available from: http://www.bol.com/nl/p/breikoffertje/9200000023435051/. [Accessed: 29th September 2015]

Hello Kitty Scissors. Available from: http://guide.alibaba.com/shop/hello-kitty-stainless-steel-scissors-household-scissors-with-blister-packaging-pink-and-red-color-free-shipping _5584759.html. [Accessed: 17th February 2016].

Glitter Glue Pens. Available from: http://www.jetpens.com/Yamato-Glitter-Glue-6-Color-Set-Classic/ pd/9298. [Accessed: 17th February 2016].

Crafting Material Kit. Available from: http://hubpages.com/art/Great-Websites-to-Buy-Cheap-Craft-Materials. [Accessed: 17th February 2016].

Glue Gun. Available from: https://www.stumptownprinters.com/store/c-diy-supplies-19/ [Accessed: 17th February 2016].

Some images in Figure C1 have been used in Figure 3 as well and are sourced accordingly.

All other images are created by the author of this report for this research specifically.