

Designing a Cargo Bike Toy which Enhances Child Development

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Within this bachelor's thesis a design research has been executed for LOEF toys, a toy company based in Rotterdam, The Netherlands. They are currently branding existing toys, so they can bring it on the market with their brand name on top (Ubert, 2024). Their focus is on toys which are beneficial for the development of a child. As they are currently branding existing toys, they do not have a development department. However, LOEF toys sees possibilities for the development of their own line of toys.

Their wish is to incorporate a new toy into a cargo bike by using the attachment part developed by "De Bakfietsclub" – another company of the same owners as LOEF toys. Because the toy can be used when sitting in a cargo bike, both companies can sell it.

The objective of the assignment was to design a concept for a toy which can be used by children between the ages of 3 and 6 when riding in a cargo bike, while keeping in mind that the toy should be beneficial for the general development of the child. From this objective the following thesis statement has been derived:

What does a cargo bike toy from LOEF which is beneficial for the general development of a young child look like?

The assignment was started with conducting (literature) research on the company, cargo bikes, child development and toys which are suitable for 3 to 6 year old children. This research gave insights on the characteristics of play-based learning, a concept of Hirsh-Pasek & Golinkoff (2008), who state that children learn through play. A toy will enhance child development if the child can learn new skills by playing with it. The gathered information resulted in two personas – one of a young child and one of the child's parent – representing the most important stakeholders of the toy. Furthermore, a list of requirements and selection criteria were made. These could be used to decide between the ideas later on in the process.

With the information from the analysis a concept design for a new toy has been created (figure 1). The designed toy specifically focuses on learning problem-solving skills, as parents are interested in toys for problem-solving skills. These are mostly purchased for their children (Michael Cohen Group, 2019).

The toy consists of two game panels – a bingo game and a puzzle game – which are connected to a rotation hinge. Using this hinge, the child can rotate the panels around 180°. In this way they can choose which game they want to play.

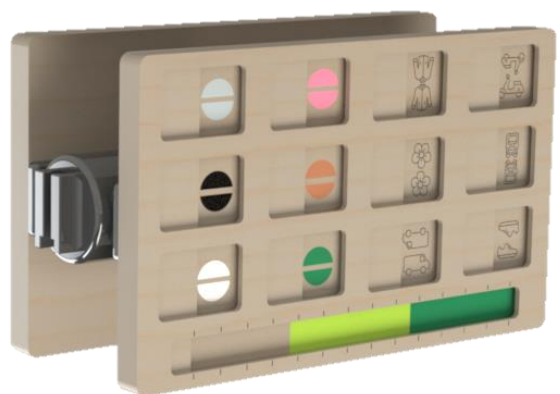


Figure 1: Concept design new toy

When playing the bingo game (figure 2), children need to use information from their environment. By combining objects they see in traffic with the corresponding symbol and colour on the game panel, points are scored. These can be tracked down on an integrated scoring board. Sliders are used to play the game and track down the score.



Figure 2: Bingo toy

The other panel consists of a puzzle game (figure 3). The puzzle includes fourteen figures which can be sorted on colour, shape, letter or numbers. There are always two figures that share an aspect – e.g. two figures with the colour green. Figures can be connected to each other by using elastic wires which are situated in the middle of the panel. To play this game, children do not need to use their environment, meaning that they can isolate themselves from their surroundings.

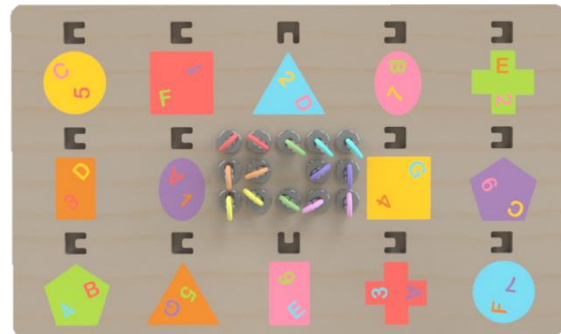


Figure 3: Puzzle toy

If the toy is connected directly to the attachment part designed by the company, there is a distance of 50 cm between the toy and the place the child is seated – only exception is when an extra bench is installed in the cargo bike. To bridge this distance an arm is designed as an optional piece to place between the toy and the attachment part (figure 4). This arm includes three friction hinges, which make it possible to adjust the arm to any desired length and angle. The friction in the hinge prevents the arm from moving after adjusting.



Figure 4: Arm

The final concept has been evaluated by doing usability tests and comparing the design with requirements and wishes which were derived during the analysis phase of the assignment. From these evaluations it became clear that the design can be further improved, as it does not meet all requirements and there are issues with the difficulty of the puzzle game. Children have difficulties attaching the elastic wires to the hooks. Further steps should be taken to improve the design, so that children will be able to use the toy without difficulties.

Furthermore, more tests should be executed on the concept. While the functionality of the game panels was evaluated, the arm was not. Also, the product has not been evaluated when installed in a cargo bike. Therefore, it cannot be said how children will interact with the toy while being part of traffic. These aspects should be evaluated upon during further development steps.

References

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