# The Supply Chain Structure of Toys and Its Impact on Children's Development and Innovation

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***Abstract*- Kids' creativity grows with playing various games and empowering this creativity not only leads them to have a better educational path, but also provides a suitable platform for their social growth, skill development and innovation. Toys are usually the basic parts of the games and have a big contribution on children's progress. Analyzing the supply chain structure of toys and its impact on children's development is the subject of this study. Observing the reaction of school-aged children while facing the moving elements of a picture was a part of this research. The results indicate that the structure of a toy has a strong power to attract children's attention and as a result can easily help them to explore the world they live in. This study reveals the important role of an efficient toy supply chain structure in helping customers to select products properly.**

**Keywords:** *Toys, Children, Development, Innovation, supply chain structure.*

## 1. Introduction

Plays allow children to use their creativity while developing their imagination. Plays are also crucial for developing children's communication skills such that play has been recognized by the United Nations High Commission for Human Rights as a right of every child [1]. It is through play that children at a very early age engage and interact in the world around them. Toys are key elements in most of the plays and can help children discover easily the world they live in.

As children spend more and more time engaging in highly structured plays (organized sports, video games, etc), they lose the opportunity to take part in open-ended and imaginative plays. Revealing the importance of plays in Kids' life and analyzing the structure of a few successful open-ended toys are under consideration in this study.

## 2. Imaginative Plays

Imagination, collaboration, innovation, and communication are the leading literacy of tomorrow's creative world. Kids create, learn and share their ideas through imaginative plays and toys have a great contribution to these plays. Open-ended toys are usually defined as those that can be used in a variety ways and various types of Lego pieces are the most popular ones known as open-ended toys. Although these toys in their various types are attractive for any creative kid and moreover recently, by adding various class of building materials, making more aesthetically pleasing and realistic designs is quite possible; still there are some other types of toys that can inspire children's creativity by for example providing a suitable opportunity for children to make stories and from this point of view, they may also be considered as open-ended toys. Open-ended toy is also defined as a toy whose play potential is limitless [2]. Suppose little hands fashion imaginary cakes, pizza, etc. and experiencing a lovely time with the friends, while playing with the wooden kitchen shown in Fig. 1. Kids continuously are creating and producing their own stories and quite simply practicing for real life. Where and how to keep various things are questions occupied children's mind during the play and the details in the structure of these toys give valuable knowledge and help children to discover what is happening around them. Ebba Bodame[1] believes that a child must foster a deep connection with a toy in order to be inspired to play with it, to use it creatively and to use it often. She also believes that the fewer toys a child has the more he is able to connect on a real and whole-hearted level [8], [9].

Fig. 1. Samples of toys that inspire kids to produce stories [2]

As toys could be open-ended tools that spark the imagination and inspire kids to create and produce their own stories and act as innovators, Games on the other hand, are inherently defined [3]. One starts at point A, ends at point B, and achieves a few predetermined tasks along the way. Since it is important that children have a chance to express their own ideas, as well as have conversations to hear other people's ideas in order to extend their thinking [4], playing with open-ended toys seems to be crucial. Since toys are divided into different categories, a careful decision-making process is felt to be a necessity in any toy supply chain management system.

## 3. Child Development and Educational Toys

Child development refers to a sequence of physical, language, thought and emotional changes that occur in a child from birth to the beginning of adulthood. During this process, children progress from dependency on their parents to increasing independence. Although child development is strongly influenced by genetic factors, it is also influenced by environmental facts and the child's learning capacity. Playing as the most important fact of child's environment, can actively enhance child's development process and toys could be more important in this regard. A few samples of toys that can be made by involving children's collaboration can be seen in Fig. 2. These attractive toys that were made from unused cardboard boxes help children learn about shapes, and find how volumes are made. This toy making process attracts children's attention to the details, and helps them to be self-confident. Learning by playing makes education enjoyable and helps children retain skills and new information much better. According to Arvind Gupta's studies, it's possible to teach an amazing wide variety of math, physics, and engineering using homemade toys and the best way of understanding complex problems is often to start with something simple [5]. How to learn the basics of mechanisms by playing with the moving elements of a picture and enjoying is described in the following section.

Fig. 2. Samples of toys that could be made by involving children's collaboration [6]

## 4. Interactive Toys

A robot, shown in Fig. 3, is a good sample of an interactive toy. By pushing the pocket, it will speak up and its eyes will also pop out. This toy was designed for kids aged over 4 years.

Fig. 3. A sample of an interactive toy [7]

For helping children to understand the mechanisms of these types of toys, pictures with moving elements such as the one designed and shown in Fig.4 could be useful. A planar four-bar linkage is the simplest movable closed chain linkage and is used for moving the hand of the shoemaker in this picture. One of the links of the chain is usually fixed and is called the ground link where in the case of this picture; the page itself is the fixed link. The circle located at the upper left side of the page is the second link and is connected to the paper (the first link). By rotating a full 360 degrees of this second link, motion transfers through floating link (the third link) and transforms to oscillating motion of shoemaker's hand (the forth link).

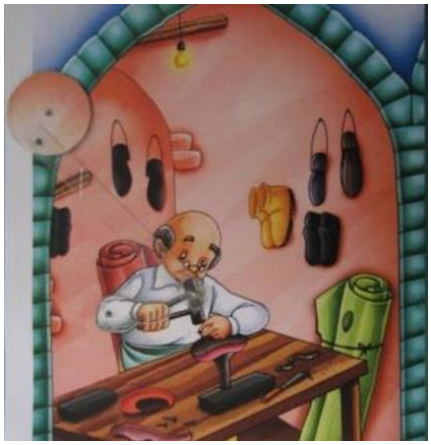

Fig. 4. A picture that contains moving elements

This picture and a simple copy of it, without moving elements, were shown to 18first-grade primary school students. As soon as they saw the motion, they began to talk with excitement. "We did not know shoes are made like this", "Is he nailing the shoe?" and "Is it possible to buy it?" are a few in the content of their discussion. Moving elements of the picture were quite successful in promoting children's curiosity, attracting their complete attention and as a result providing a good platform to gain a better understanding. This simple observation reveals the power of interactivity when the target is attracting the children's attention. Simplicity of the mechanism was also quite helpful for their realization. It seems having these kinds of figures, among the pages of a fiction book, encourages children to read the books attentively.

Since good toys for children need to match their stage of development and emerging abilities, parents need some helpful information for selecting appropriate toys. Choosing the right toys for children would be quite possible if the answers to some questions like "Does the toy offer an opportunity for fun, to learn and to think?, Is there more than one use for the toy?, etc." are available in the toy supply chain structures.

## 5. Results and Conclusions:

- Toys help children in understanding the world around them
- Plays help children to extend their knowledge, innovation, and realization
- If the complexity of toys become understandable, children find better opportunity for learning
- Details in the structure of toys attract children's attention
- Books that provide the possibility of playing could be more successful in attracting children
- The toy supply chain structure may include recommendations about selecting toys to manage customers' service effectively.

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