Using the haptic qualities of origami to develop coginitive abilities

Sabrina Morisson - Design for All conceptor

Introduction

We postulate that the method used for **memorization** influences the potential to obtain and retain information. When people are in a familiar situation their memorizing skills are enhanced.

In addition **haptic design** gives the opportunity to build a representation of an object or an environnement, which can be memorized and kept in our memory for later use. The body, exteroceptive perception, and sequenced and progressive actions all contribute to information processing.

In 2014, a special needs educator asked me to work with his group of adults who had severe cognitive disabilities. The aim of this workshop was to **develop their cognitive skills and abilities to be creative**. With the art of origami they could learn, and become familiar with a sequence of actions, in a reassuring space.

QUESTION 1 Cognitive abilities

When our cognitive capacities are dysfonctionnal, when one of our sensory faculties is missing, or when the circumstances disturb our attention, how can we develop our concentration, memorisation and mental or sensitive representation ?

QUESTION 2 The haptic qualities of origami and spatial geometry

How can we use haptic modality to develop cognitive fonction ?
How does origami give the opportunity for this ?
How can we help people to understand how a 3-dimensional structure is built ?

The haptic qualities of origami

- Origami gives the opportunity to understand step-by-step how a volume is built, always following the same principals. The foldings could be similar in different origami, as for example in the illustration on the right.
- With our method, people can pratise the manipulation of each step and understand without help or text explanation.
- The paper has different textures on each side, giving cutaneous and visual references.
- The manipulation of the paper requires focus and concentration, and practise with both firmness and flexibility.
- The size of the book offers an adequate environnement in which to prioritise concentration and avoid distraction and stimulation.
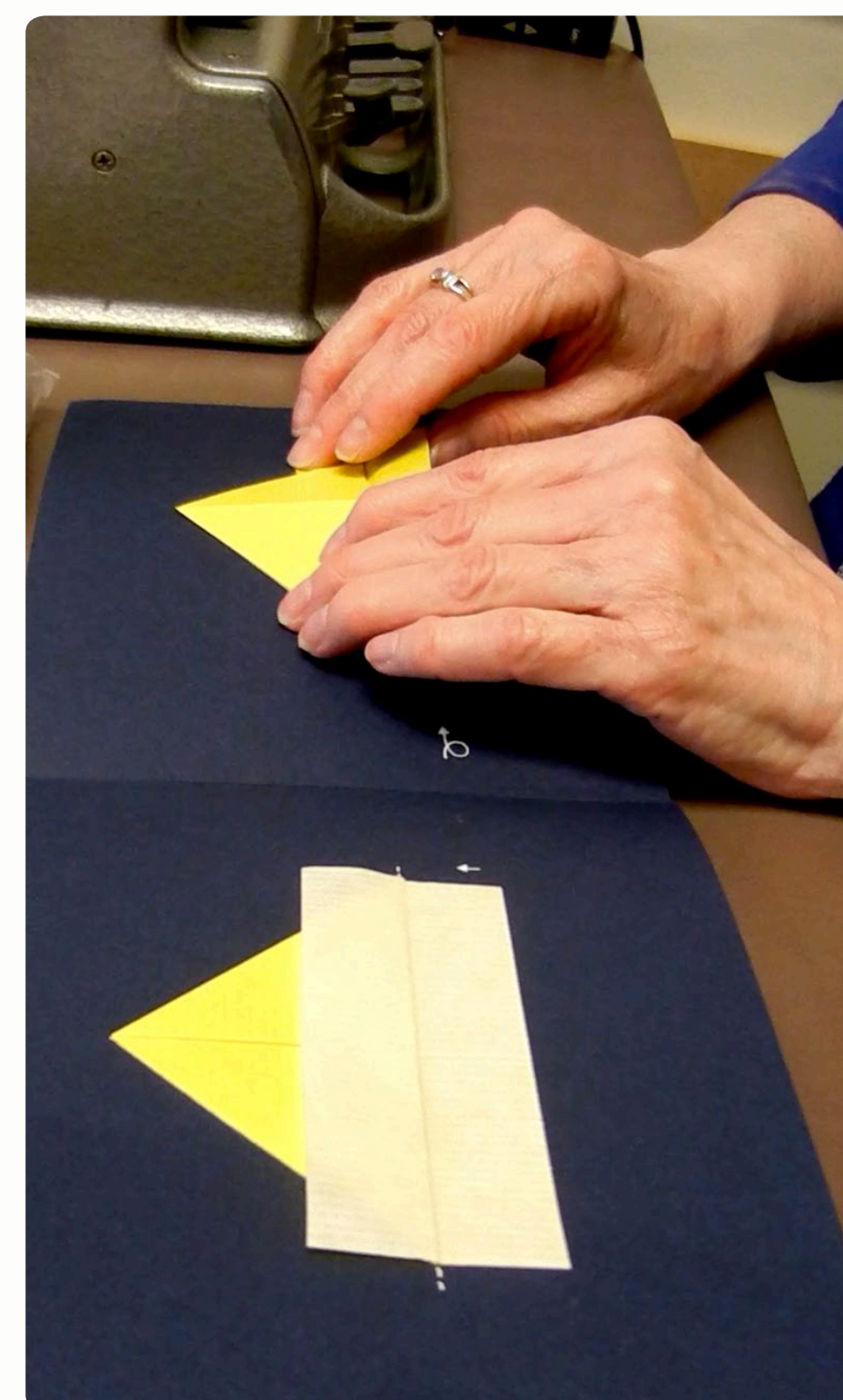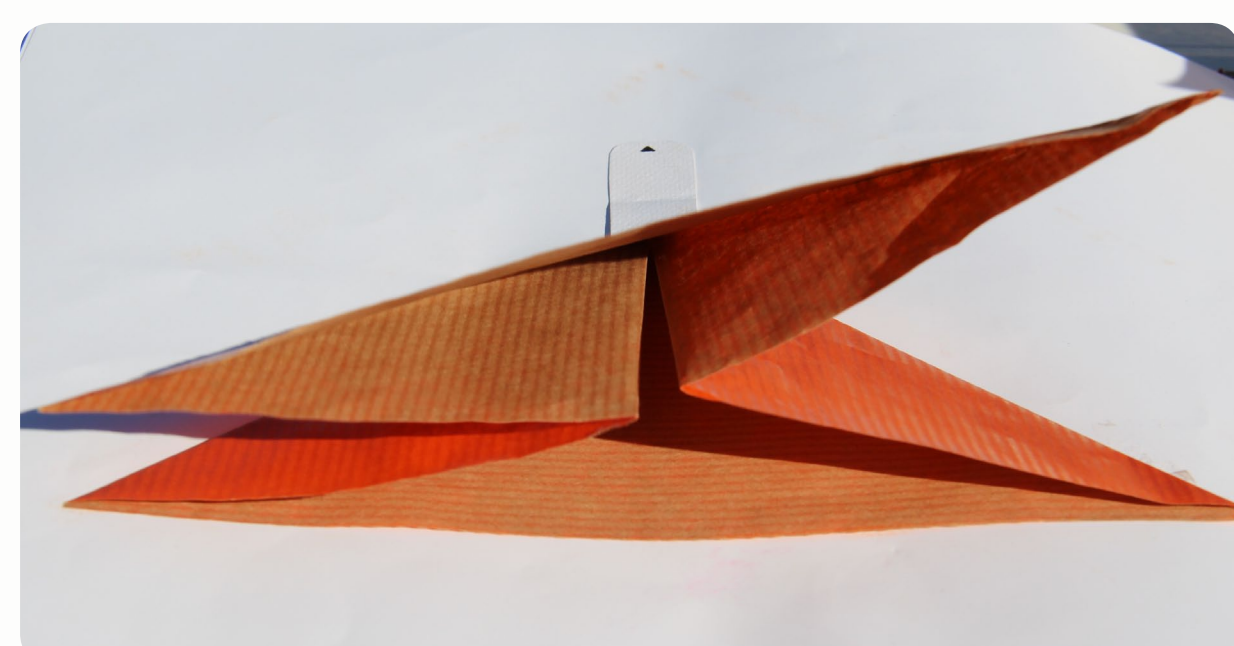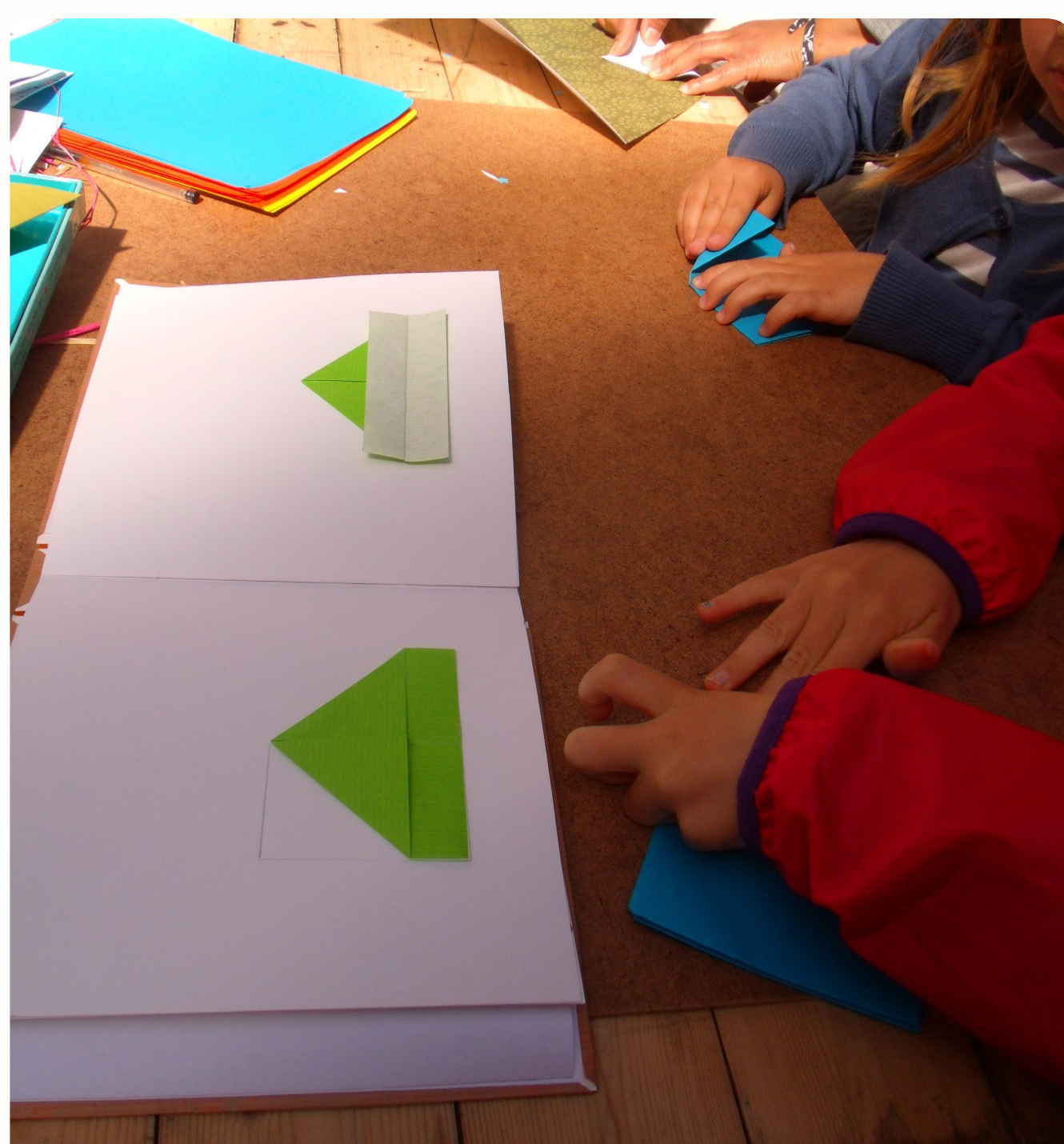

Participants and methods

The first group was composed of 7 people, who had different mental disabilities. They were all in their 50's. Through 9 workshops over the course of one year, we took time to explore and find the best way to develop their cognitive abilities.
After each worshop, I observed and documented :
- **what and how they explored** (book, image, spontaneously, tentatively ...)
- their actions during **the workshop** (folding strategy, speaking, ...)
- their capacity for **concentration** (on one folding, the full length of the wrokshop,...)
- their behaviour and participation in the group (doing by themselves, helping others, waiting for other people to do for them, remembering and telling stories about origami, ...)

Among the 7 participants :
- **4 stayed voluntarily more than 2.5 hours per workshop**
- **5 of them could fold origami without assistance**
- **4 of them could share folding skills with others**
- **1 of them was able to acquire vocabulary in termes of spatial geometry such as the triangle for which he had not previously had any form of representation**

- This educational method was created during this experience.
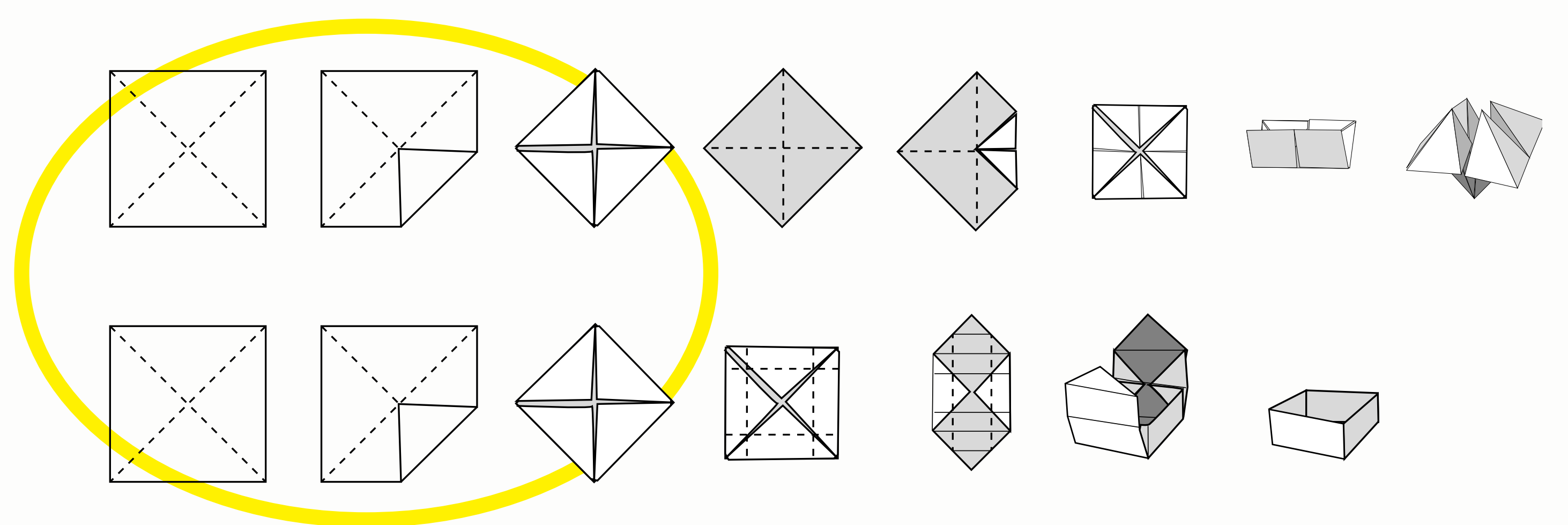
The second group was composed of 78 trial subjects from 6 different groups and situations. For these groups the time, concentration, focus and knowledge were limited in order to evaluate the efficiency of the method.

n 1 • **50 people** of all ages in a noisy environnement
n 2 • **8 teenagers** from 14 to 16 years old in a competition against the clock
n 3 • **4 healthcare personnel**, impromptu during a coffee break
n 4 • **4 child** of 5 years old
n 5 • **2 foreigners**
n 6 • **5 blind people**

At the first attempt
70 % succeeded their origami without help.

Discussion

How could this method be developped for young people at school who have difficulties with spatial geometry and concentration ?