Can Interactive Art Installations Attract 15 Years Old Students to Coding?

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Abstract. In this art demonstration we will present the art installations which are at the center of a creative development program for young students with the name KODELØYPA. KODELØYPA is based on the philosophy of creative reuse of recycled materials and the open-source software Scratch and Arduino. KODELØYPA is based on an empirically validated framework, designed and implemented by researchers and artists.

Keywords: Creative activities, software and hardware development, physical–digital creativity, art and technology.

1 Introduction

The Norwegian University of Science and Technology (NTNU) offers six science frameworks for Norwegian primary and secondary schools with the objective of raising interest in various science disciplines from physics, chemistry, mathematics, biology, energy, to coding. The framework, dedicated to raise interest in coding is based on the hypothesis that the interactions between the children and the artifacts in a creative activity are vital [5]. In this framework children learn coding by playfully interacting with digital artifacts that also exhibit physical and aesthetical characteristics. Such artifacts allow children to learn by iteratively testing and rebuilding their designs [2]. The interactive installations presented by this paper are the concrete results of our efforts to develop an authentic environment for creative learning that helps school children, to build their own digital game based on the interplay of digital and physical objects. KODELØYPA represents a good example of novel directions in the creative learning. In particular, in this paper we focus on the artifacts specifically designed and created for the workshop program where children collaboratively engaged in modifying interactive artworks that react to events in the physical world [6].

2 KODELØYPA: An Approach to Enhance Creative Learning

KODELØYPA is based on open source software and hardware and consisted of tutorials on open source tools, artifacts, creative sessions and students' demonstrations/

presentations. Up to date, KODELØYPA has organized four workshops, allowing 63 students to be introduced to coding (about 15 children per workshop). Our thesis is that coding skills improve children understanding of the design and functionalities that underlie all aspects of interfaces, technologies, and systems we encounter daily. It is important that everyone should use code in some ways for expressive purposes to better communicate, interact with others, and build relationships.

Fig. 1. Left: The artist organizes old computer pieces and other garbage to prepare the components to be used for the physical phase. Right: One of the assistant animates the spider installation by help of motors.

KODELØYPA is based on a well-documented and validated framework [4, 5].   It enables children to engage in programming languages (i.e., Scratch) and programmable hardware platforms (i.e., Arduino), to enable them to become the creators and programmers of their own playful experiences. KODELØYPA takes place at NTNU′s premises. Children attending the workshops are instructed and assisted by one artist, and 6 assistants; who have organized the process in advance (Fig. 1). The art demonstration will present the artifacts developed during KODELØYPA (Fig. 2 shows one art installation).

3   Requirements for the Exhibitions

In the demonstration we will illustrate the process (Fig. 3), as well as the tangible results from the KODELØYPA program. These are interactive installations made by a team of artists, designers, and programmers for the purpose of enabling young students to become creators of interactive experience with both artistic and technical qualities.

We can exhibit up to five interactive installations. They vary in size but they are all smaller than 1 cubic meter. Each one can be connected to a PC and is programmable. A screen with a video about the program will be provided.
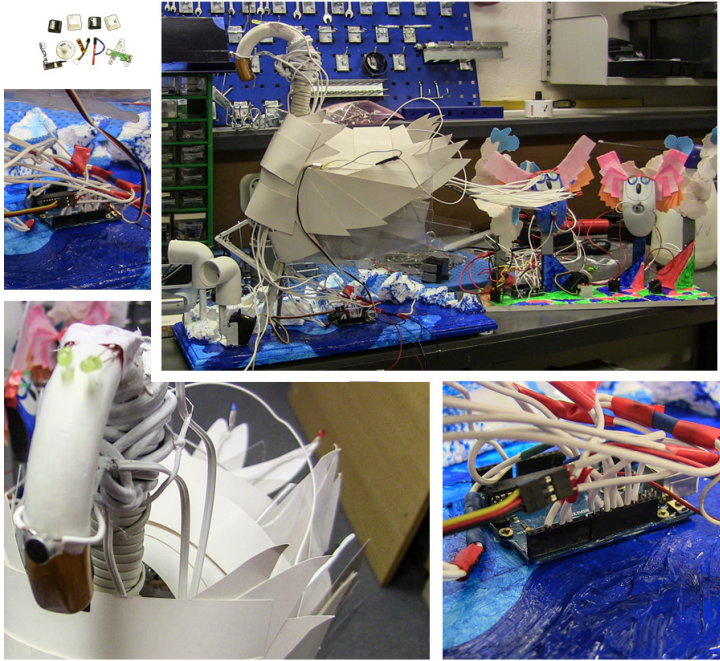
Fig. 2. One concrete installation: the swan.

Fig. 3. Picture from one workshop: children play, program, interact with the assistants.

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