
To Scaffold, or Not to Scaffold: That is the Question

Daniel Fitton

ChiCI Research Group
University of Central Lancashire,
Preston, UK.
DBFitton@UCLan.ac.uk

Janet C Read

ChiCI Research Group
University of Central Lancashire,
Preston, UK.
JCRead@UCLan.ac.uk

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Abstract

This workshop papers reflects on the use of scaffolding in co-design activities with children and teenagers in order to lower barriers to generating and interpreting creative contributions. The context of this paper is primarily young people designing for new and novel technologies with which they may not be familiar. The motivation for scaffolding is first considered then a co-design method, Primed Design Activities, which utilizes scaffolding is then discussed. Finally the paper identifies key points to be considered when utilizing scaffolding in the context of co-design.

Author Keywords

Co-Design, Design, Children, Teenagers, Scaffolding, Creative Contributions.

ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous;

Introduction

The success of a co-design session is usually measured in terms of what the designers/researchers learned, which is closely coupled to the creative contributions of the participants. A successful co-design activity then relies on 1) the participants understanding the design task, 2) the design task enabling and supporting the

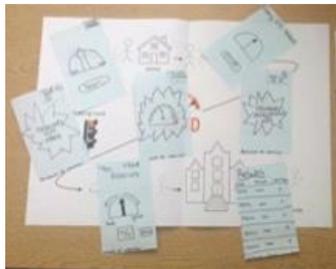


Figure 1: Completed Primed Design Proforma

participants to engage in the activity, and 3) the activity providing outputs which can be successfully utilized by the designers/researchers. Typically there are often further challenges to be considered especially when working with young people (children and teenagers) where they may struggle to reflect on their understandings, and may be unwilling to ask questions or convey emotions if uncertainty or frustration arises during a design activity. An example of this may be when participants are being expected to create designs incorporating novel technology they may know little about and have not encountered. Additionally, the contexts of use, and therefore desired designs, of novel technologies will likely be dynamic and context sensitive and therefore require high-order reasoning skills to imagine a design concept, again being potentially challenging for children. Designers/researchers often have high expectations of creative contributions from participants where designs typically need to fulfill often complex requirements such as solving a specific problem, using a specific technology, for a specific user group in a specific context. This complexity introduces challenges for conveying the design activity to participants and collecting/analyzing the outputs. One approach to addressing the three challenges identified earlier, in the context of designing for new/novel technologies, is scaffolding in the form of guidance provided to participants to help support and guide completion of the design activity whilst helping to avoid potential problems. A specific co-design technique for young people including scaffolding, the Primed Design Activity (PDA) approach, was developed and tested [1][2]. This workshop paper reflects on the findings from this approach.

The PDA Technique

The PDA technique was initially published in [1] where the discussion focused on the use of PDA to scaffold design sessions with teenaged participants through carefully 'priming' the participants in the design session. The key aims in creating the technique were ensuring that participants understood the task they were asked to engage with, and that appropriate outputs were captured during the design session. Within the PDA technique researchers follow four steps, the first is to create an information sheet that explains salient aspects of the What, When, Who, Why and How of the design task very briefly and in language appropriate for the participants. This is used to structure the introduction of the task to participants and given to the participants as a reference if needed during the task. Secondly, an Ideas Sheet is created that prompts the participants to write down answers to questions about their design idea, these questions relate to key requirements for the designs produced such as 'What hygiene habit or habits does your game focus on?' and 'How does the player win?'. Thirdly, a Scenario Sketch is created which shows the movement of the user through time and space and conveys the different context of use as clearly as possible. This requires the designers/researchers to select a representative usage scenario that will be meaningful and hopefully understood by participants in the design session. The Scenario Sketch needs to be printed on paper large enough for participants to place or draw their designs on. Finally the researchers must prepare the materials to run the session with participants and plan carefully to ensure the session run identically across all groups. When running the activity the participants are firstly introduced to the task using the information sheet from the first step, the participants

then consider their ideas and answer the questions on the Ideas Sheet, the participants then draw a mark on the Scenario Sketch at each point where a user will interact with the technology, user interfaces are then drawn/placed onto the marks on the Scenario Sketch (completed Ideas Sheet and Scenario Sketches can be seen Figure 1). The intention is not to constrain participants to their initial answers on the Ideas Sheet and marks they placed on the Scenario Sketch, participants are free to let their designs change and evolve, these aspects simply lower barriers to participants rapidly creating an appropriate initial design idea. In [1] the paper concluded that PDA was useful in ensuring the two key aims were met, but fell short of a deep analysis of the concept. In [2] PDA was first compared with a less scaffolded design technique with pairs of children aged 9-10 years, this showed that designs in the PDA condition aligned more closely with the requirements for the design activity and analysis of the designs showed that the scaffolding had no adverse effects on their creative content. In the same paper a second PDA design activity with pairs of young people aged 11 to 15 showed that the technique allowed participants to engage with a complex design challenge and produce useful and intelligible design ideas.

Discussion

The PDA technique offers several solutions to the three criteria outlined at the beginning of this paper:

- *Participants understanding the design task* The participants have a specific information sheet intended for reference in the case of any uncertainty, they also answer questions at the start of process intended to 'prime' them before creating the visual representation of their design ideas.

- *Enabling and supporting the participants to engage in the activity* The Scenario sketch sheet makes clear a context of use for the design task, and provides a structure or narrative in which visual representations are placed.
- *Providing outputs which can be successfully utilized by the designers/researchers* Both the answers to the priming questions and designs on the scenario sketch are taken away from the session which greatly assist understanding of the design ideas: the two examples in Figure 1 provide all key aspects of the desired apps (this is discussed in detail in [2]).

While PDA proved a successful technique, especially in the context of new and novel technologies, its use requires careful decisions which constrain and scaffold design activities. Care must be taken that scaffolding does not bias participant designs, and the use of the scaffolding must be remembered when interpreting the designs produced. For example, in study in [2] a short car journey from home to school was depicted as the scenario sketch sheet and a longer or different journey may have provoked different design ideas from the participants. The technique was primarily derived to gather potential screen designs for mobile devices and would require adaptation for use with other interface modalities. Each of the PDA studies reported in [2] was carried out over a 25 minute time period and with more time participants may have added extra detail to the scenarios, or been allowed to choose from a selection, or even to define their own. One of the key advantages of the PDA technique was the speed in which a set of potentially useful designs was created, and this is particularly useful when working with young people where access to participants can be challenging and

designs must often be created in a minimal time. The prescribed nature of PDA may also be a useful attribute for designers valuing consistency and repeatability across designs produced by a large number of participants or with different groups of facilitators. The PDA technique may also prove helpful for those with little experience of carrying out design sessions with child and teenaged participants where, if the scaffolding is created effectively, it could potentially allow a higher chance of collecting useful designs.

References

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