

# A novel children-oriented data gathering technique

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## ABSTRACT

The diffusion of digital technology in everyday life is bringing into the realm of digital products users with novel demands, which translate into novel design/research issues, as in the case of children-oriented systems. Involving children in the design is a key factor to obtain usable products, but how to do it is still an open question. Consolidated data-gathering techniques, theoretically useful but not conceived for children, reveal some drawbacks: in diaries the rate of returned data may be low, interviews are difficult to conduct in a strict time, observational approaches may be judged intrusive.

In this extended abstract, we sketch a novel children-oriented data gathering technique retaining pros of existing techniques while overcoming their limits. The technique was conceived and validated within an Action Research [1] experience, while designing TERENCE, an adaptive learning system supporting 7-11 years old children characterized by poor text comprehension [2].

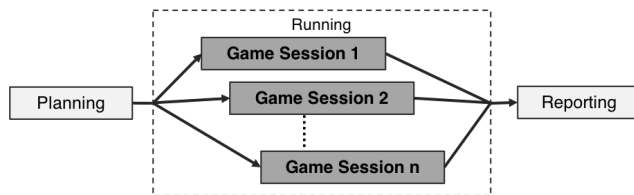


Figure 1: The overall structure of the method.

We worked under the assumption that it is advisable to blend features from existing techniques with a game framework, to motivate children by gameful activities [3]. The method combines *direct observation* during game administration with *indirect observation* on collected materials (e.g., game results, notes) and is structured as a sequence of three stages (*planning*, *running*, and *reporting*) shaped according to the outcome of a preliminary study producing, among others, in-depth knowledge on topics/subtopics to be investigated.

The **planning stage** is focused on design/realization of the *investigator kit*, which will guide all subsequent game sessions. The kit - including games, game materials, notes templates, and a database (to be populated by data gathered during the running stage) - must satisfy the following requirements: (R1) there must be a specific game for each topic to be investigated; (R2) the game set must include games with different cognitive load so that a game session has warm-up, peak, and relaxing phases; (R3) topics (and associated games) are prioritized according to relevance to the project so to be able to adjust game sessions on the fly at run time depending on interrupts and other unpredictable events; (R4) the estimated duration of a game session should not exceed 60 minutes. Design

of individual games has to consider a number of factors: (i) each game must cover all subtopics of its associated topic and has to be shaped according to game frameworks and motivational models [3]; (ii) mandatory characteristics of individual games are: playfulness, child personal enrichment, compliance with ethical issues; (iii) each game must include a rewarding mechanism, so to stimulate the production of genuine data from children; (iv) games should produce children-generated collectable results (e.g., conceptual maps).

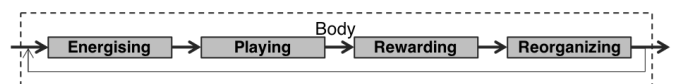


Figure 2: The Body structure.

To collect as many data as possible from different children groups, the **running stage** consists of a number of independent game sessions based on the same investigator kit. Though theoretically independent, it may be useful that game sessions are not run simultaneously (Fig 1). Each session includes four phases: *nurturing* (investigators explain the aim of the session and establish a playful atmosphere), *motivation* (based on motivational theory), *body* (investigators administer games and observe children), and *closing* (each child gets a reward, investigators reorder collected material and write down first impressions). The body is designed as a cyclical iteration of four steps (one iteration for each game, Fig.2): *energizing* (investigators introduce goals, moves, rewards), *playing* (the actual game takes place), *rewarding* (investigators assign prizes to winners), *reorganizing* (investigators dynamically adjust the session planning based on how activities are going). Data gathered through games are then analyzed and used, during the **reporting stage**, to populate the database previously designed.

In TERENCE, two streams of data gathering were conducted in parallel by two teams, one based on customary observational methods, and the other on the new approach. Results' comparison showed that data gathered by the new approach were qualitative and quantitative richer than the ones produced by traditional methods, and then were taken as a reference for the project.

## KEYWORDS

Action research, data gathering, children-oriented design, games.

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