# Chindogu and Scrapheap Spirit as Creativity Triggers

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## ABSTRACT

This paper presents an analysis of the process of group creativity during the Chindogu Scrapheap Challenge, an event that was held as part of a LeonardoNet Workshop in November 2005.

Workshop participants were divided in three groups and given a challenge specific to HCI. Immersed in the Scrapheap and Chindogu spirit, groups aimed at finding a solution to the challenge, using materials and equipment either provided by the organising committee or found by the group.

Groups generated a remote wild animal interaction device, a static mobile phone charger and an installation for catching cats' memories and dreams.

During the experiments we observe different ways of approaching the challenge: one structured and organised, contrasted with another nearly chaotic. External objects helped as sources of insight, but also limited potential ideas. Constraints importance was evident, not only with respect to themes, tenets and evaluation criteria, but also with respect to maximum completion time.

### Author Keywords
Creativity, Innovation, Groupwork strategies, LeonardoNet, Chindogu, Scrapheap.

### ACM Classification Keywords
H5.m. Information interfaces and presentation: Miscellaneous.

## INTRODUCTION
The Chindongu Scrapheap challenge was part of the 3rd LeonardoNet Workshop. LeonardoNet[1] is an international research network, set up to define a programme of research in the area of culture, creativity and interaction design. The purpose of the network is to look at Human-Computer Interaction as it pertains to the theory, design and application of interactive technologies. In this context, the programme aggregates multidisciplinary researchers from art, design, information technology, computer science, engineering, architecture, cultural studies, and media studies, among others.

The concept of this experiment derives from previous Scrapheap events held at Lancaster since 2003[2]. As the name points out, the Chindogu Scrapheap Challenge joined the spirit of Scrapheap and Chindogu. The Scrapheap Challenge is an engineering game show produced by RDF Media and broadcasted on Channel 4 in the UK. In the show, teams of contestants have 10 hours to build a working machine to perform a specific task, using materials available in a scrapheap[3]. Chindogu[4] is the Japanese art of inventing ingenious everyday gadgets. These, appear to be an ideal solution to a particular problem, however, anyone actually attempting to use a Chindogu invention would find that it causes so many new problems or such significant social embarrassment, that effectively it has no utility. Thus, Chindogu are sometimes described as "unuseless" i.e.: they cannot be regarded as 'useless' in an absolute sense, since they do actually solve a problem, however, in practical terms, they cannot positively be called "useful".

## EXPERIMENT
The 3rd LeonardoNet Workshop involved a total of 20 people, comprised by students, teachers and researchers from various universities. From these, 16 participated in the Chindogu Scrapheap Challenge.

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[1] Find details in http://www.leonardonet.org/index.php.

[2] Find details and examples in http://polo.lancs.ac.uk/Scrapheap/.

[3] Scrap is a term used to describe the recycling of metal. Old, unwanted metal such as vehicles, building supplies, and surplus materials, are taken to a scrap yard, where they are processed for later melting into new products.

[4] Find details and examples in http://website.lineone.net/~sobriety/.

The event included mainly two stages: i) one to find ideas, mainly conceptual; and ii) another to implement ideas, essentially practical in nature. These were preceded by an opening session, detailed bellow, and concluded with a final session, in which each group presented the work developed.

During the opening session, the Challenge was briefly described with respect to the evaluation criteria[5] and the Chindogu tenets[6]. Afterwards, the participants were spread over groups and placed in separate rooms. Each group was given the experiment guidelines, which included criteria and tenets and a challenge specific to HCI.

There were six themes, from which the groups chose one or more themes to develop:

- Enhancing experience – what drags people in?;
- Interactions in the wild – how does technology breaks boundaries?;
- Connecting with others – what happens around and through technology?;
- Mind, body and spirit – how does diversity impact?;
- Interactions for me – what improves my experience?; and
- At the periphery – how can ambience engage?

Immersed in the Scrapheap and Chindogu spirit, the aim of each team was to find a solution to the challenge, using materials and equipment either provided by the organising committee or found by the group members, while keeping the Chindogu tenets in mind.

As a result, one group generated a remote wild animal interaction device, using petting enabling technology, another group developed a low-power, one-second call-time, static mobile phone charger, and the third group an installation for catching cats' memories and dreams. The key features and materials used to implement these ideas/solutions are synthesised in Table 1.
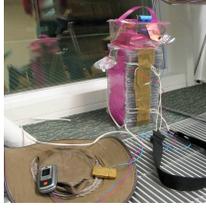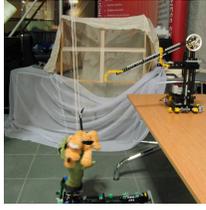
The solutions created were appreciated by a panel of judges[7], who gave each team an overall score. The score was based not only on general creative and practical criteria, but also on the Chindogu tenets and evaluation criteria.

Based on video footage, we observed and analysed the activities of two groups, one integrating the conceptual part and another including the implementation part as well. This study revealed interesting aspects with respect to creativity that we detail in the next sections.

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[5] There were four criteria: innovation, style, achievement and engagability.

[6] View http://www.chindogu.com/chindogu/tenents.html.

[7] The judges were not specialists on creativity, innovation or problem solving.

| Ideas/solutions | Key features | Used materials |
|---|---|---|
| Group A Remote wild animal interaction device, using petting enabling technology  | – Rewarding emotional interaction<br>– Remote mechanized animal petting device<br>– Connecting with animals without fear | – Back scratcher<br>– Lego robot<br>– Mechanical tickling hand<br>– Computer mouse<br>– Rubber bands<br>– Sheets and plastics for tent<br>– Computer for voices<br>– Puppet dog |
| Group B Low-power, one-second call-time, static mobile phone charger, with free nylon carpet for use in the wild  | – Static electricity mobile phone charger (no winding up)<br>– Static generator on carpets to charge a mobile phone for one second of connectivity | – Empty cd boxes<br>– Kitchen foil<br>– Campervan carpet<br>– Wires<br>– Small battery<br>– Mobile phone<br>– Sellotape<br>– Capacitor<br>– Rope |
| Group C Installation for catching cats' memories and dreams  | – Memories and dreams player for peoples houses, grave yards and digital tombstones<br>– Dreams caught while cat sleeps on cushion<br>– Video memories played when people or other cats go to places where cats used to be. | – Dream catcher<br>– Cushions<br>– Projectors<br>– Powerpoint slides<br>– Dog robot<br>– Ribbons<br>– Fluffy cat toy |

**Table 1: Synthesis and characterization of ideas**

**PART 1 – FINDING IDEAS**
The first part of the Chindogu Scrapheap challenge was dedicated to the generation of ideas, occurring more or less like a brainstorming session. In this phase, participants were requested to find a concept or idea based on the themes, evaluation criteria and Chindogu tenets. The found concept or idea would then need to be implemented on the second part of the experiment.

We analysed the activities of two groups, A and B, both constituted by five people. In to what concerns to the first part of the experiment, these were analysed with respect to the group members' interaction, the group work atmosphere and the group work strategies.

**Group interaction**
As synthesise in Table 2, every member of the group assumed a clear role while working on the project.

| Group | Participant | Role/Function |
|-------|-------------|---------------|
| **A** | a<br>b<br>c<br>d<br>e | – Manager/Idea generator<br>– Critic/ Idea generator<br>– Manager/ Idea generator<br>– Implementer<br>– Observer |
| **B** | x<br>p<br>t<br>o<br>z | – Leader/ Idea generator<br>– Leader/ Idea generator<br>– Implementer<br>– Critic/ Idea generator<br>– Observer |

**Table 2: Roles and functions of group participants**

The managers were responsible for the group dynamism and performance. Their questions and suggestions directed the tasks undergoing within the group. In practice, in group A, member *c* wrote the themes and tenets on the board as well as the emerging ideas[8], interrelating them. On a second phase, *c* drew sketches of the imagined solutions on a flipchart. Member *a* also assumed a manager role, although only sporadic and temporarily, providing guidance for tasks through his questions. With respect to group B, there were also two managers, but in a different outline situation: member *p* would assume the manager role when member *x* was away from the meeting room. Moreover, while member *x* was mostly worried with the group final idea, its finding, development and implementation, member *p*, was predominantly concerned with the group name, the criteria to double score or other remaining organisational aspects.

Member *b* and sometimes member *a*, in group A, and member *o* in group B, were the critics. These, although not directly suggesting ideas, would frequently introduce questions about them, contributing for its better development and deeper understanding.

The observers, member *e* in group A and *z* in group B, almost never gave any contributions, spending most of the time quiet.

Finally, there are the implementers, member *d* in group A and member *t* in group B, who dedicated most of their attention to the video camera or to computer related tasks.

**Group work atmosphere**
The group work atmosphere and environment of group A and B were totally different. Group A worked in a very calm and organized atmosphere. Their tasks flew in a very structured way.

Contrarily, Group B was sometimes nearly chaotic although enthusiastic and live. From the atmosphere of permanent fun and laugh, it was fairly obvious that this was an exciting experience, especially when the group had to twist things around and make them unreasonable for the conventional world. In fact, only *t* seemed to resist this temptation.

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[8] Mostly ideas would emerge from managers and critics.

**Group work strategies**
Regarding work strategies, group A had a very structured approach to their tasks. We identified five stages: i) What do we have (in terms of objects)?, ii) What solution can we create from these objects?, iii) Can we connect things together?, iv) Where does this solution fit in the challenge themes and Chindogu tenets?, and v) Why should we or should we not develop this idea?

Group A only looks at the criteria and challenge points after working on the ideas, connecting and relating them with the themes and tenets. The group orderly scanned through each idea on the board, while trying to understand not only the good and bad aspects of it but also why it should be dropped or implemented.

As to group B, there was not such a clear approach. Each theme of the challenge was casually put forward to discussion by *p* and afterwards a brainstorm about it would occur. However, this all occurred in an unstructured way. In parallel, the group would also reflect on the evaluation criteria and tenets, aiming at a decision.

Besides the final idea several ideas have emerged, group A generated five potential ideas, group B generated nine.

*Time and constraints*
The first time group A refers to an idea that made part of the final one is on minute 8, when they think of a back scratcher, as something to attach to a bin and that is controlled by a computer mouse, an idea that they detail and develop until minute 32. But, despite the level of development and attention dedicated to that idea, the group opts to develop a remote dog petting device. In our opinion, this is due to the group sympathy towards the idea (*a*: *"I kind of like it!"* *b*: *"I kind of like it as well!"*).

Concerning group B, the first time that the group refers to an idea that made part of the final one is on minute 11, when they refer to a mobile phone (at the moment, to identify who is around on conferences, in order to avoid them), followed by the one second activity on minute 15 (at the moment to play a game) and the static shocks on minute 38 (at the moment, generated while you walk). And immediately after having these three ideas and merging them into a single one, the all group feels a great enthusiasm, as the following expression reveal:

*x: "Wow… Yeah… That would be really useful… To charge up our phones... We could communicate while we are in the wild…*

*p: "Wow... A phone charger on static energy from nylon carpet... It's not a bad choice!...The spot! In the wild!"*

*x: "So when you charge you don't get so much energy, so my guess is that it will give us a second of energy to talk..."*

Interestingly, from the early beginning of the meetings (group A around minute 10, group B around minute 15), the groups try to combine previous ideas in order to form new ones. From our perspective this occurs not only to enrich the ideas but also to please the participants.

The most difficult task for group B was finding a name for the group. This was a permanent recurrent task, firstly raised on minute ten but only accomplished 40 minutes later. Member *p* draws the attention of the group to the need of identifying a group name eight times. The group used several strategies to find a name, but they only chose a name when the group folders were being collected. Then, the group immediately thought of a name. This lead us to think that constraints and tension may be important for creativity groups, helping on achieving goals.

*Insight*
When analysing creativity groups, it is not only interesting but also important to understand what constitutes an inspirational link. In this sense, the groups analysed had two different approaches to this. As we referred previously, groups were allowed to use material either from the scrapheap room or brought by them. Both groups had one or more members that brought objects, but while group A shared those objects at the beginning of the meeting, group B only did it at the end of meeting and therefore after having selected a specific idea to develop. This resulted in Group A using these materials (a back scratcher, a hook, a mouse, and the bin existent at the meeting room) as starting points for insight on potential new ideas. From our analysis, Group B did not have a pattern for a source of inspiration, limiting their search to the challenge themes contained in the instructions, from which they would brainstorm.

Additionally, both groups used the web in order to find insights, group A for the development of their idea, specifically on dogs, petting dogs and remote dogs petting and group B to understand the themes in the challenge and potentially use them to find a name for the group.

The process followed for the implementation of ideas will be described in next section.

## PART 2 – IMPLEMENTING IDEAS
In this section we analyse the second part of Chindogu Scrapheap Challenge, focusing in the activities of group A, the only group for which video material was available. As mentioned earlier, this part of the experiment was eminently practical. Briefly, in this stage, the participants developed their ideas and, with the available materials, implemented them. Due to materials and time constraints these implementations were not totally functional.

Our analysis will focus on several aspects such as the work environment, the work strategies, the main tasks performed by the group, the group work collaboration and the problem solving strategies.

**Work group strategy**
Similarly to the first part of the experiment, group A was quite calm and organized. Despite working on an improvised desk of the computing department corridor (Figure 1), the group promptly started the implementation. This was mainly organised in four tasks: i) gather materials from the scrapheap room; ii) draw a detailed sketch of their idea; iii) build each part of the idea; iv) integrate each part in a unique gadget; and v) prepare a presentation and its environment.


**Figure 1: Group A work environment**

As listed in Table 1, to build their ideas, the group members used a back scratcher, a Lego robot, a mechanical tickling hand, a computer mouse, rubber bands, sheets and plastics for improvised tent, a computer to produce the voices and a puppet dog. Not all these materials were collected during the first task. Actually, the first task was revisited each time the group realised something else was needed to implement their project. For example, when member *c* was sketching the remote animal interaction device, during the implementation (when the group realises they need rubber bands or string to attach the back scratcher to the robot) and while they were preparing the presentation (when the group realises they need sheets to improvise a tent or a volunteer to go on the wild).

**Group work collaboration**
Each member developed different tasks or parts of the project independently, although with a great sense of work collaboration. In fact, each member was responsible for a specific part of the project, for instance, participant *c* for building the Lego robot or participant *b* for providing the sounds to interact with the dog. But, actually, every time a member of the group had a difficulty, doubt or suggestion, it would be put forward towards the group.

Sometimes the group work was a pure problem solving exercise, as the following excerpt demonstrates:

> a: "That should work but we have to solve that problem with stability (...) probably it is not that difficult, but we need to get this wheel in place..."
>
> b: "Maybe a string…"
>
> c: "Doesn't need to be as long."

Compared to the first part of the experiment and based on our analysis and interpretation, the group clearly enjoyed more this part of the experiment The greatest moment of realization and achievement occurs when the group is able to integrate the robot, the tickling hand and the back scratcher, managing to make them work as one piece of material and *c* exclaims: *"It has got potential!!"*.

## DISCUSSION

Both observed groups showed different ways of approaching the challenge: one structured and organised group, contrasted strongly with another nearly chaotic, mostly influenced by the different personalities of the groups' participants. At the end, both groups concluded the challenge on time and with success. Moreover, engagement and enjoyment was evident on both groups, as the challenge was mostly experienced as a fun game. The group participants also adopted various roles, such as manager, idea generator, implementer and observer/critic.

External objects both helped as sources of insight, but also limited potential ideas. Group A used external objects as idea generation aids, but unconsciously, the group limited their ideas to the objects they had available, as they thought of a possible use for each object. As a result group A generated five different ideas, while group B, with no starting points, formulated nine. Nonetheless, once the group generates their ideas, they tend not only to revisit them, in an attempt to keep them all, but also to merge them, as a way to enrich them. In the end, both groups selected an idea that above any other reason, they sympathised with.

The importance of constraints was evident. The groups felt that they needed to understand themes, tenets and evaluation criteria, in terms of its limitations and significance. This was fundamental to define the boundaries of their idea spectrum that had to respect the event rules. In effect, the correct understanding and respect of those was crucial to perform well on the challenge, reinforced by the competitive nature of the challenge. Interestingly, the groups were not only concerned about how their ideas could fit in and respect the instructions, but also about their more pragmatic good and bad aspects, from many perspectives and tradeoffs, such as money, time, usefulness or interference with other activities. Despite the apparently broad and zany brief, the creative process involved both divergent and convergent sub-activities; the importance of both of these aspects have been argued before booth by the authors and others [2, 3].

Finally, we note the significance of time as a constraint. As referred, a member of group B raised the need to find a name for the group nine times without success, but when someone from the organisation came to collect this information, the group managed to select a name.

Curiously, it did this immediately and apparently with no difficulty. Clearly a time limit can be an important way to trigger ideas. This reinforces our own previous experiences and more general studies on the importance of constraints [4].

## CURRENT AND FUTURE WORK

We are currently refining an analysis of creativity based on creativity teaching techniques such as de Bono's 'Thinking Hats' [1] and 'BadIdeas' [2]. We plan to apply this to the transcripts to make more detailed analysis that compliments the more data-driven reported here. While it is impossible to generalise from a small number of group interactions, still this early analysis highlights several interesting issues regarding the creative process.

## CONCLUSION

The conclusions that we can draw from this experiment in terms of creativity and its related issues are limited, as, firstly, creativity in its nature is hard to define and evaluate and also because this particular experiment was not monitored, guided, or evaluated by creativity experts, who could help us on assessing it. But even if we can not generalise, our analyses of these experiments contribute with a few interesting findings.

We found that in the experiment, each group: i) managed to find its own distinct work strategy and atmosphere, without compromising task completion; ii) made explicit use of external objects to trigger ideas; iii) ended up implementing first and foremost the idea that they sympathise with; and iv) dedicated their attention clearly to constraints, such as the themes, tenets and evaluation criteria and time.

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