

# BadIdeas 3.0: A Method for Creativity and Innovation in Design

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## ABSTRACT

Creativity and innovation emerge as fundamental requisites in terms of design and development of present-day user interfaces. While conventional user interfaces need to ensure usability, less conventional interfaces additionally require creativity and innovation. In order to nurture these elements throughout the process of design and development of novel user interfaces, the author proposes the use of the BadIdeas 3.0.

The BadIdeas 3.0 method initially focuses on the generation of bad ideas, which are then submitted to a critical examination. This examination subsequently results in a more convergent analysis of the bad ideas. Later in the method, these ideas are transformed until they are of good use and have materialised into a tangible artefact or idea for future implementation.

This paper presents the BadIdeas 3.0 method in full, explaining its structure and providing guidelines for its use.

## Keywords

BadIdeas, Creativity, Innovation, Design, Critical Thinking, Lateral thinking, Ideation

## INTRODUCTION

Creativity – the ability to produce new and original ideas – and Innovation – the introduction of new things [22] – have both assumed roles of crucial importance for user experience design over the past few years [7][33][47][14][23]. Having observed this interest from the community, an understanding on how creativity and innovation can be nurtured during the processes of design and development of novel user interfaces can be used to develop the BadIdeas 3.0 method - a tool for the support of this process. The BadIdeas 3.0 method, an iteratively designed method that has been shown to be useful for innovative idea generation whilst supporting the design and development of novel user interfaces, that encompasses creativity and innovation, is presented in this paper.

The paper is organised in the following way. The following section contextualizes user experience design and develops

an understanding of creativity and innovation design. The early work that led to the BadIdeas 3.0 method is also introduced. Later in the paper, the current version of the method is described in full and this is followed by guidelines on how to apply the method. Finally, the author describes future possibilities for research in this lively area.

## BACKGROUND

Since it arose as a discipline in the early eighties, Human-Computer Interaction (HCI) has always represented the quality of the interaction between humans and technology [25][39][34][7]. HCI is responsible for creating products, which are useful, usable and used [7]. While the first two properties (useful and usable) are more related to the task and the way in which it is accomplished, the last one (used) is much more related to the user experience. As time passes and usability becomes almost ‘easy’, this last property, ‘usedness’, has been receiving more and more emphasis [23]; The emphasis on ‘usedness’ and user experience has resulted in a radical change [14] that triggered a change in the HCI palette of methods, tools and responsibilities, which need to be extended to encompass more creative and generative activities [23].

Fitting creativity into HCI is not a problem-free process; there are two significant obstacles to overcome: firstly, the preponderance of documented HCI methods tend to focus on heuristics, guidelines and patterns, which do not always leave sufficient space for creativity; secondly, despite the number of years of study dedicated to creativity by several authors [45][12][30][1][2][43], the concept of creativity is still not entirely explained. Lack of knowledge about creativity contributes to the problem of finding methods to encourage creative and innovative thinking.

According to Guilford [13], the abilities most relevant to creative thinking are to be found in divergent production abilities that allow information to be generated from information and from transformation abilities, which involve the revision of what one experiences or knows, thereby producing new forms and patterns. Koestler [17] refers to this process as a bi-sociative process, whereby a person links previously unrelated knowledge structures within the mind. Likewise, Boden [2] describes the creative process as the exploration and transformation of conceptual spaces. Despite the different wording, the underlying concept of these authors understanding of the creative process is equivalent.

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Exploration of a conceptual space involves recalling bundles of knowledge, which are triggered by a stimulus [36]. This stimulus can be perceived either consciously or sub-consciously. A stimulus is conscious when one deliberately considers potential associations; in contrast, it is sub-conscious when the stimulus is perceived, but without intention or conscious effort. Stimuli activate one or more bundles of knowledge of the conceptual space [36] and these are connected to one another by associations [11].

When two or more previously unrelated bundles of knowledge form a new relation which subsequently offers a potential solution to a new domain, transformation takes place [11]. Transformation occurs when new combinations occur, thus giving rise to a new idea. The more distant and unrelated the bundles of knowledge forming a new combination are, the greater the potential there is in terms of achieving a more creative and novel result [36]. Similar to exploration, transformation can also occur at a sub-conscious level, being revealed unexpectedly at a 'eureka' moment [45].

In considering the skills needed for the creative process, Amabile [1] introduces concepts such as domain-relevant and creative-relevant, as well as task motivation. These particular skills are believed to affect the performance of the individual. Domain-relevant skills affect the persons' performance in a specific domain; creative-relevant skills and an individual's cognitive style affect the way in which a person explores and transforms conceptual spaces; task-motivation determines the enthusiasm with which a person tackles a task. Amabile [1] describes the creative process according to five phases: problem and task presentation; preparation; response generation; response validation; and outcome. During the problem and task presentation, motivation has to be high to such a degree that the individual has enough interest to engage in the problem-solving process. Preparation refers to the gathering of information relevant to the problem, and accordingly seeking a potential solution. During this phase, domain-relevant skills are particularly relevant. The response generation phase is affected by the individual's creative-relevant skills and task motivation. These creative-relevant skills determine the quality of the solutions produced, 'as the better the individual is at exploring conceptual spaces, the more novel the solutions are likely to be' [46]. Response validation is related to domain-relevant skills, since a greater knowledge of the domain enables the individual to better assess the solutions' appropriateness.

Important to this process is conceptual fluidity and focus or control [11]. Fluidity of thought is important when exploring or seeking solutions. Whilst thoughts often occur randomly, at a certain moment, focus is deemed critical. At some point, a single idea detaches from the others, and the individual has to focus on this creative idea and subsequently develop it; this is a pattern which a number of creativity models exhibit and that is emphasised by several authors' works (e. g. [9][11][35]) — an initial divergent

phase, characterised by generation, diversity and expansion and a convergent phase, characterised by selection.

### **Alan Dix's Silly and Bad Ideas**

The backdrop of the BadIdeas 3.0 method is found in the Silly Ideas approach as defined by Dix in 1995. This approach consisted of a straight-forward exercise offered as part of an ensemble of techniques in order to help students to technically innovate [5]. The Silly Ideas technique is closely related to the Problem Reversal creative problem solving method as documented by Charles Thompson in his 1992 book 'What a Great Idea'.

In the use of the Silly Ideas approach, as practised by Dix, a single session was split into two parts (i. Bad ideas generation; and ii. Critical examination). This process typically ran for around an hour. In the first part participants were required to generate 'silly ideas'. The second part was a critical examination phase, in which participants were given a set of simple prompt questions in order to help them reflect upon the ideas produced in the ideas generation phase. The prompt questions were as follows: What is good about it? Why is it good? What is bad about it? Why is it bad? Why do it this way?

The Silly Ideas approach combines three fundamental aspects of creativity: the ability to explore and connect distant bundles of knowledge [13][17][2][36][11], the importance of domain-relevant skills, and the need for task motivation [1].

Since then, this approach has iteratively evolved and has been used with several groups of participants in a variety of contexts. The author of the paper explicitly started studying this method since 2006 in more detail and developing it into a mature and structured method: the BadIdeas 3.0 method.

### **THE BADIDEAS 3.0 METHOD**

The BadIdeas 3.0 method originates from the Silly Ideas approach as described in the previous section. The process by which the method was refined is described in [42] — three iterations from this early idea were made, firstly to create the BadIdeas method v1, then to create BadIdeas method v2 and finally to define the BadIdeas 3.0 method.

BadIdeas 3.0 is a method for the design of interactive technologies. It is intended for use with stakeholders at the early stages of a design activity and is best used with groups of stakeholders. These stakeholders are hereinafter referred to as participants due to the participatory nature of the BadIdeas 3.0.

### **Structure of the Method**

This section describes the structure of the BadIdeas 3.0. The method is composed of six phases (Figure 1):

1. Presentation of Design Brief
2. Generation of Bad Ideas
3. Analysis: What? Why and When Not?
4. Turning Things Around
5. Making it Good

## 6. Selection of Outcomes

Each phase is described with respect to its goals and how it should be carried out.

**Phase 1 — Presentation of Design Brief** — is essentially concerned with the description of the design problem to the participant group.

This phase should include a clear statement about i) the domain and ii) the context of use for which the group will be generating ideas.

The part of the statement about what the design domain is should provide a clarification of the broad area in which the group is going to work. For instance, there is a difference between aiming towards an idea for public displays and aiming for an idea for a Web 2.0 service. An example of what could be included in this part of the statement could be: *the use of sensor-based technology in medical settings.*

The second part of the statement should provide some clarification on the context of use, while answering the questions who, when and where is the design going to be used. An example of this would be: *the design is going to be used by nurses working in triage rooms.*

In this phase the facilitator of the method may also briefly explain how the BadIdeas 3.0 works and what it aims for.

### BadIdeas Method v3



**Figure 1: The BadIdeas 3.0 – Phases Synopsis**

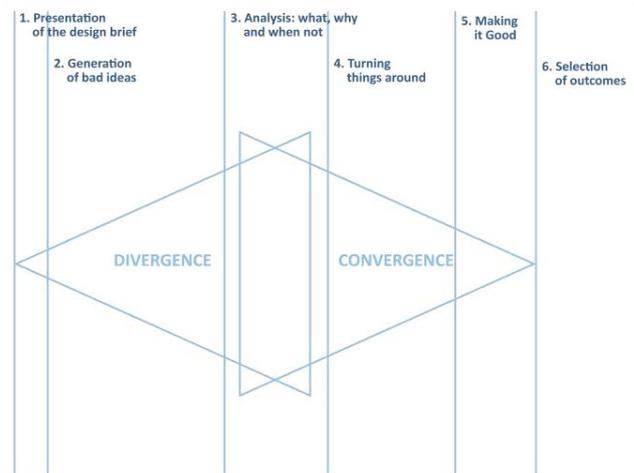
**Phase 2 — Generation of Bad Ideas** — consists of asking participants to generate silly or bad ideas. It is also a two-part phase where, in the initial stages, the participants are given some instruction in the ‘meaning’ of a bad idea (and some examples if needed) and then a second part where ideas are generated.

Participants are informed that the essence of the method is to generate silly or bad ideas initially to solve a problem rather than aiming directly for ‘good’ ideas [8].

In describing what a bad idea is, the facilitator needs to stress that bad ideas intentionally aim at being bad, silly, crazy, weird and/or impossible [6]. Examples of bad ideas, such as a glass hammer or an inflatable dartboard can be found in [8].

Having understood the idea of a bad idea, the participants are then instructed, singly or in groups (as suits the occasion) to think of as many bad ideas as possible. Quantity and ‘badness’ are encouraged.

**Phase 3 — Analysis: What? Why and When Not** — examines the nature of the ideas obtained in the second phase. This enables an understanding of these ideas as well as their related concepts and, ultimately, their design space. This critical examination turns the divergent nature of the ideas themselves in a more convergent and analytic direction. This is the reason why in Figure 2, Phase 3 is placed close to the end of the divergence triangle.



**Figure 2: Divergence and Convergence Activities in the BadIdeas Method**

But then also to contract the problem space, from the initial set of generated bad ideas, participants select those that gather consensus and gratification amongst all in a process that has similarities to Csikszentmihalyi’s ‘Flow’ [3]. As noted by Amabile [1], who points out that task motivation is a crucial aspect for creativity, this selection by participants adds to the motivation effect. To support this selection process, the BadIdeas method uses a set of prompt questions (Figure 3). When using the BadIdeas method, to assist participants in this process, an example can be given. One example is an engine-less car partly extracted from [8]. Where the bad idea is a ‘broken’ variant of an existing thing, such as the engine-less car, there are natural ‘good’ things that are benefits of the original item, when not broken. For example, an engineless-car could still roll along the road with external propulsion. However, part of the rubric that goes with these prompts is to try and apply these to the obvious ‘bad’ feature. For instance, ‘What is good about not having an engine?’

This examination of the positive aspects is one of the things that may lead to novel good ideas. The answer to the question about the engine-less car might be: ‘The lack of an engine makes it lighter and cheaper and it does not use any petrol!’

THE BAD	THE GOOD
1 - What is bad about this idea?	1 - What is good about this idea?
2 - Why is this a bad thing?	2 - Why is this a good thing?
3 - Are there any other things that share this feature but are not bad?	3 - Anything that shares this feature but is not good?
4 - If so what is the difference?	4 - If so what is the difference?
5 - Is there a different context where this would be good?	5 - Is there a different context where this would be good?

**Figure 3: BadIdeas Prompts**

A variant of prompt 4 is prompt 5 where a thing that is bad in one context may be good in another. These 'good contexts' may be silly contexts, such as a car on an elephant's back. Silly contexts would be unexpected and probably apparently crazy. Another example would be a smart dice made of ice. The bad aspect is that ice is made of water that melts. The water then ruins the sensor circuits. So, what is good about the ice dice? Ice is good to cool cocktails and drinks in general. So an ice cube that could tell people when to stop drinking, in case they were driving, would be a good idea.

This conclusion reached, the initial idea is then ready to be changed regarding its properties. In the ice dice example, the properties of the materials coating the sensor would need to be changed so that it would be protected. Identifying a good use for the initial bad idea — smart dice made of ice — is not a result of the analysis phase of the method.

The analysis phase therefore serves three purposes, it:

- Examines the nature of the ideas,
- Informs our understanding of the ideas themselves and their related concepts, and
- Applies a convergent analysis to the divergent ideas obtained in phase one.

**Phase 4 — Turning Things Around** — continues the process of uncovering the ‘good’ aspects of bad ideas.

Thinking of 'good' aspects about bad ideas can sometimes be hard. So the method uses a set of three strategies to help participants to uncover new dimensions and possibilities: going back and forth, changing context and role-play.

The first of these strategies, going back and forth consists of alternating between positive and negative aspects of each feature and uncovering opposite properties. For example, a caravan is like a car but has no engine, yet the lack of an engine is not bad for a caravan. As we examine why this is the case we begin to see positive things about not having an engine.

A different context (strategy two) often helps to uncover the good aspects of an apparently bad idea. For instance, a Web page with cluttered images and text is not good, but if we think of the context of YouTube, subsidised by advertisements, it proves to be a smart feature [40].

Strategy three is role-play. Participants can imagine that an expert deliberately designed the ‘bad thing’ this way, so, it should be good, then, why? The intention is not to show that bad things are actually good, but to uncover new dimensions and possibilities. When all else fails, participants should imagine they are a second-hand car salesman selling the bad idea!

Before explaining phase 5, it is important to state that phases 3 (Analysis: What, Why and When not), 4 (Turning Things Around) and 5 (Making it Good), are not completely independent and separate. In fact, they intersect and are often revisited.

**Phase 5 — Making it Good** — aims to turn the bad idea into a good one, while keeping the initial design problem in mind. This often happens on its own accord during prompting, but if not, it is addressed as a separate stage. Where the bad idea is a 'broken' thing, like an engineless car, it is 'cheating' to make it good by mending it ('Put an engine in'). However, the fixing of the bad idea can often be done by changing the context of use. As said before, mending is 'cheating'; by just mending the 'broken' thing we are no longer enabling divergence to happen, but just reapplying previous knowledge of situations that have worked before. Changing the context is a different thing. By looking for a different context we are forced to look for alternatives and to explore possible alternatives further.

The difference between the phase ‘Making it Good’ and the phase ‘Turning Things Around’ is that during the latter, participants must produce something that has the beginnings of pragmatics. Reverting back to the example of the ice cube that could tell us when to stop drinking, in case of driving; at this stage, participants should start providing practical and concrete solutions for the problem, such as using a specific material for coating the sensor circuits, and then safely placing the sensor inside the ice cube.

**Phase 6 — Selection of Outcomes** — comprehends the evaluation and selection of the ideas that are going to be further developed into fully working prototypes. A panel of judges should evaluate the generated ideas and the low-fidelity prototypes, if available.

The judges should be selected according to the nature of the settings in which the ideas are going to be used. For instance, in real-life conditions, the company would define the composition of the judging panel. Regardless of the situation, it is advisable that this panel is composed of at least three individuals: an expert in HCI, an expert in development and implementation and an expert on creativity. Each of these experts should weigh up the quality of the proposed solutions for novelty and for

appropriateness regarding their particular knowledge domain.

This section described the structure of the method, synthesised in Figure 1, the next sections provide guidelines on how to plan for and on how to deliver the BadIdeas method.

#### **How to Plan For and Facilitate a BadIdeas Session**

BadIdeas sessions need several things: a problem to solve, a judging panel, a facilitator to direct the process and one or more participants. The facilitator of the BadIdeas method has to pay special attention to the activities which support creativity and innovation and therefore needs to be familiar with the motivations and purposes of the BadIdeas method. For instance, the ability to explore and connect distant bundles of knowledge mostly depends on participants' contributions, but concerning domain-relevant skills, a facilitator should build up knowledge in two domains. The first domain, and common to every application of the method, has to do with creativity concepts. The second domain is specific to the design brief and therefore may vary in every application of the method. For the first, a facilitator should have reasonable control and understanding of creativity mechanisms (please refer to [42] for further reading). This means that, for instance, the facilitator should be aware of, and acknowledge how to use and apply, analogy and role-play. For the second it is advisable to research the topic and area of the design brief before facilitating a BadIdeas session. These domain-relevant skills may be helpful, and, at times, required, to support the groups in generating, analysing, transforming and developing their ideas.

Additionally, there is motivation; a factor that can be affected by the facilitator of the method as studied by [31][19]. The role of the facilitator is crucial to capitalise the participant's motivation. To promote this, as well as facilitating the general preparation of the session, there are a number of behaviours and activities that the facilitator should promote.

As outlined above when planning for a BadIdeas session, the facilitator has to develop a clear description of the design brief. This information will then be used in Phase 1 — Presentation of design brief — when, as described earlier, a statement about the problem brief is provided to the participants. In parallel, the facilitator should prepare a set of other materials, which include:

- A means to display the design brief (e.g. a photocopy or a projected slide)
- Sheets of paper for participants to record ideas (A3 size if working in groups and A5 size if working individually)
- Pencils and pens to write down ideas
- Flipcharts for participants to develop and detail ideas
- Photocopies of the BadIdeas prompt questions

The set of behaviours and tasks that a facilitator should promote when running a BadIdeas session are the ones that promote creative thought, motivate participants, and lead the BadIdeas process, as presented next, phase-by-phase.

#### Phase 1 — Presentation of Design Brief

- Create a friendly environment amongst participants and between the participants and the BadIdeas facilitator.
- Introduce the BadIdeas method and provide a brief overview of its phases and goals.
- Describe the design brief, which needs to be prepared beforehand.

#### Phase 2 — Generation of Bad Ideas

- Define what a bad idea is.
- Introduce two examples of bad ideas, which should be previously prepared. If no other examples are available use the glass hammer and inflatable dartboard example included in Dix et al. [8].
- Be prepared to motivate or build up participants' confidence if they block, by transmitting them that the process will reveal productive and they should not fear saying the silliest things.
- Be prepared to generate and share your bad ideas with the group. This should be used as a stimulus to idea generation but should never monopolise it.
- Pay attention to the group's behaviour (for instance, if a change in the hum of voices is noticed) and when the group shows signs of being dried up interrupt the ideation process and proceed to the next phase.
- The idea to pursue should be selected by the participants, however if this is not the case, consider the aspects in Figure 4.

#### **What Makes a Good Bad Idea?**

- A good bad idea has to be purposely bad, silly, crazy, weird and/or impossible
- A good bad idea has to be vague enough to allow transformation
- A good bad idea is not too detailed, so that it becomes harder to lay aside those details
- A bad idea does not need to be related to anything or to any domain in particular, including the design brief

#### **Figure 4: Help on Identifying a Good Bad Idea**

#### Phase 3 — Analysis: What? Why and When Not

- In the case of swapping bad ideas between groups, redistribute bad ideas among the groups.
- Distribute the BadIdeas method prompt questions to the participants.
- Lead participants to use the BadIdeas method's prompt questions.

- Be prepared to help the participants in the process of disentangling the good and the bad aspects of ideas being analysed. A certain level of abstraction to understand good and bad aspects in a broader context may be needed.
- Use creativity mechanisms whenever appropriate to nurture creativity. Dissection, Abstraction and Transformation are powerful mechanisms at this stage of the method (for details about these mechanisms see [42]).

#### Phase 4 — Turning Things Around

- Suggest role-play to motivate participants to work on the further understanding of their bad ideas and do not let them drop their bad ideas neither the discussion of those.
- Alternate between the good and the bad aspects of ideas to facilitate the occurrence of ‘clever twists’.
- Be prepared to see the bad ideas in different contexts. Domain-relevant skills may be needed.
- Use creativity mechanisms whenever appropriate to nurture creativity. Role-play and Transformation are powerful mechanisms at this stage of the method (for details about these mechanisms see [42]).

#### Phase 5 — Making it Good

- Verify that the idea has the beginnings of pragmatics.
- Verify that the developed idea provides a solution for the initial design brief.
- Make short videos, in which participants explain their final idea.
- Collect all the materials used and produced by participants.

#### Phase 6 — Selection of Outcomes

- Verify that the final idea is novel and appropriate.
- Whenever possible, a panel of domain experts that should be gathered prior to the BadIdeas session should rate participants’ final ideas.

#### **Scope of Application and Examples of the BadIdeas in Use**

The BadIdeas method aims at supporting design and redesign activities in general. It can also be applied to novel user interfaces that are likely to belong in the domain of user experience design. These interfaces demand that creativity and innovation be nurtured and the BadIdeas method is introduced as a tool to support this demand in a process that starts with idea generation and ends with a semi developed concept and prototype of design.

A set of documented examples of use of the BadIdeas method can be found in [42]. These examples include cases of design and redesign applied to various domains, such as situated public display, Web 2.0 services, Ubiquitous computing sensors, and applications for tablet PCs.

The BadIdeas method’s scope of application is likely to be extended to other sub-areas of the user experience design, such as art installations, interactive performances,

unexplored domains or domains in which other techniques fail (an example of this is the case of YouTube as detailed in [40]). The method is less likely to be applicable to domains, in which requisites are narrow and strictly defined and there is a set of style-guides and criteria that needs to be respected (for e.g. a maintenance software for critical systems). This is the case of more conventional areas of software interfaces.

#### **DISCUSSION**

This section discusses the value of the BadIdeas 3.0 method. The discussion is developed in two parts, being that the first tries to point out the drawbacks of the method and the second its advantages.

#### **Limitations of the BadIdeas 3.0 Method**

In line with other processes of group creativity, the BadIdeas method is susceptible to factors affecting face-to-face interaction in a group such as production blocking, evaluation apprehension, and free-riding [21][4][26]. The method is especially susceptible to evaluation apprehension. On the one hand, the technique explicitly aims at the generation of bad ideas to reduce personal attachment; while, on the other hand, generating bad ideas and pointing out the bad aspects of these ideas may be embarrassing. The same may occur during the analysis phase, when participants are requested to explain why specific ideas are bad. Dix et al. [8] report an example of this, when a considerable amount of time passed before someone said that an inflatable dartboard would be a bad idea, because the darts would puncture it. The case of the inflatable dartboard may also illustrate a case of production blocking, where people might have not wanted to state the obvious, because it seemed too obvious.

A good bad idea needs to hold the greatest possible potential of transformation. Amongst other aspects, this means that the idea has to be ‘bad enough’, otherwise the bad idea is easily fixed and the demand for exploration and divergence minor. However, there is no guarantee that the ideas produced in the ‘Generation of ideas’ phase will hold enough ‘badness’. If this is the case, the facilitator may share her/his own bad ideas. However, this leads to another sensitive aspect of the method: the role and the impacts of a facilitator.

The influence of a well-trained facilitator in creative problem solving was studied by [31] and [19]. Recent studies [42] performed with the BadIdeas method indicate that the facilitator influences participants’ use and enjoyment of the method. The facilitator may be required to support the participants in the generation of bad ideas and in the process of disentangling the good and bad aspects of a given bad idea, etc. However, the conditions in which facilitation takes place are difficult to control and highly variable.

The last phase of the BadIdeas method ‘Selection of outcomes’ uses a panel of experts to judge the final ideas of a BadIdeas session on originality and appropriateness, since these are the characteristics that define a creative product

[32] [24]. However, despite being a measure, this is still a subjective one, which not only is likely to depend on experts' knowledge of the domain, background and preferences, but also is liable to fluctuate according to the expert's interpretation of the idea being rated.

### **The Value of the BadIdeas 3.0 Method**

There is a considerable variability in respect to the circumstances and contexts to which the method has so far been employed [42]. Examples of use have demonstrated this not only by the variety of domains the method can be applied to, but also by the possibility of applying it to design and to redesign purposes, sometimes following after a design brief, other times without a specific design brief.

The early phases of the BadIdeas method show similarities with more common creativity and problem solving techniques, such as Analogy [27] and Brainstorming [30][15]. The use of examples is included, so is the request for quantity and the preoccupation with defer of judgement. Analogy is used as a creativity mechanism that enables a quicker understanding of the task to perform and also as a potential starting point for new ideas. Compared to Brainstorming, the BadIdeas method encourages freewheeling, as it explicitly asks for bad ideas. Less likely than with good ideas, 'bad ideas reduce commitment so that people are more likely to think 'out of the box' (and) they don't have to defend their choices [8].

When generating ideas and when selecting an idea to pursue, the BadIdeas method purposely looks for bad, silly, crazy, weird and/or impossible ideas. On the contrary, other techniques look for appropriateness, feasibility or coherence. According to [29] 'the cognitive network can be expanded due to priming by the incongruous'. By purposely looking for bad, silly, crazy, weird and/or impossible ideas, the BadIdeas method postpones and favours divergence i.e. lateral thinking until later phases of the method, increasing the potential to connect distant bundles of knowledge, identified as fundamental for creativity [13][17][2][36][11]. So, once ideation is concluded, a bad idea is selected to proceed with and transformed until it can be of good use. Divergence can still occur throughout this transformation and the occurrence of clever twists is viable and likely to happen, therefore constituting an asset.

Upon use of the method there is the beginning of pragmatics. This can occur in the form of an idea that is conceptually developed or in some cases also develop into a paper prototype. Prototypes emerge as artefacts that communicate ideas and from which these can be further developed into full working prototypes. In either case, a reflective conversation and designers' dialogical conversation with materials, as defined by [38] takes place.

Apart from the final result achieved from a bad idea, the BadIdeas method enables the development of an understanding of the design domain, as explained by [37]. As stated by Boden [2], creativity is explained by an

extensive knowledge of the domain. This is enabled by the use of prompt questions.

Prior studies also point to the fact that the method encourages some alteration of the participants' thinking process. This was first reported after studies performed at Darmstadt (partly reported in [41]), when the author was informed that participants of BadIdeas sessions still used and referred back to the method weeks after the sessions. Informal conversations about the use of the method by colleagues in Illinois and Madrid report on similar effects.

The BadIdeas method was used in a number of instances involving different audiences. Taylor et al. [44] reports on a study that involved primary school children, contrasting with the study reported in [41] which involved post-graduate students. Despite the specificities of the groups, none of the groups exhibited resistance towards the method, instead the method shows transferability amongst audiences. It was also interesting to realise that children can easily generate bad ideas, which can later be used and transformed by adults. Moreover, recent studies [42] show that there are no strong correlations between the potential or creativity of individuals and the results obtained at the end of a BadIdeas session. This indicates that potentially anyone can be involved in a BadIdeas session.

This is interesting for creativity, since people with different personality profiles [18] and diverse experience [16] have different knowledge that when externalised and shared among group members, potentially leads to new ideas and insights (see also [28][10]). Also, the Scandinavian approach, stresses the importance of the active and creative participation of end-users in product development [20]. Likewise, other HCI methodologies place the emphasis on the users. Given the transferability factor and receptivity that the method gathers among audiences makes the BadIdeas appear as an interesting tool for HCI.

One final aspect is noteworthy: the atmosphere in which the BadIdeas sessions take place. BadIdeas sessions were observed to be moments of fun and humour. Humour has two effects on thinking that facilitate creativity [29]: 'First, the cheerful mood associated with humour should reduce tension and anxiety. In a state of relaxation, individuals would show less fixation and rigidity in their responses to problem-solving situations. Second, beyond the reduced rigidity, there might also be a wider range of opinions that could be considered'.

### **CONCLUSIONS AND FUTURE WORK**

This paper contributes mainly with the BadIdeas 3.0 method. This method has been shown to be useful for innovative idea generation whilst supporting the design and development of novel user interfaces that encompasses creativity and innovation.

The bad ideas that are generated in the early phases of the method are later submitted to a critical examination. This more convergent analysis of the bad ideas, results in the

transformation of the initially bad ideas into ideas of good use that can potentially be fully implemented in the future.

Throughout the paper, the author presented the background work in the field of creativity and user experience design as well as the specificities of this method, its structure and guidelines of use. The limitations and advantages of the method are also discussed. This should provide future users of the method with an improved understanding of the method and how it works.

As reported in the paper, the BadIdeas method was iteratively developed and has now reached a more mature and structured form. For this reason, it would be now interesting and valuable to run more studies to test the method, for instance by comparing it with other early design methods, or by, more specifically, assessing the effects of the learning of the method by the participants and of the skills of a facilitator.

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