

## ENHANCING THE DESIGN PROCESS WITH DRAMA-RELATED METHODS

Keywords: drama, acting, design

### ABSTRACT

This paper presents a critical review of several applications of drama-related methods to design, discussing their benefits and limitations and providing comment on practical aspects of their implementation. Drama-related methods can shed light on the contexts in which a new product will be used, helping to clarify any potential issues users may have with the design. These methods can improve communication and facilitate more fruitful collaboration between the various stakeholders. Improvisation can be used to improve the effectiveness and reliability of brainstorming sessions. However, the level of acting skill required of the participants needs consideration, and must be appropriate to the purpose of the evaluation. Also, drama methods generally add resources to the design process, and there is a lack of validation studies of tangible improvements to the designed product. We provide recommendations for design-drama approaches with the potential to benefit different stages of a product's development.

## INTRODUCTION

User-centered design (UCD) is a design paradigm which places users at the center of the development process. Exploring user needs, generating new ideas and evaluation of novel product concepts are well-known aspects of UCD (Maguire & Bevan, 2002). Although standard UCD methods such as interviews, observations and field studies have been long established, these approaches lack the opportunity for creativity, for example the envisioning of future scenarios around a product concept (Fleury, 2012). In contrast, methods which draw upon aspects of drama have been used in design processes to offer inspiration and to explore contexts of use from new perspectives, and in collaboration with end-users (Salvador, 1998; Kuuti *et al*, 2002; Brown *et al*, 2014). They can be used to more thoroughly capture the emotional needs of end-users and the social dimensions of an interaction (Kuuti *et al*, 2002). Furthermore, drama-based methods can involve all stakeholders in the design process, providing a platform and opportunity to encourage users, designers and managers to contribute their inspirations and ideas.

This review presents the ways in which drama-related methods can be used as part of a UCD process, and explains when or why they might be used. It looks at several phases of the process, including background research, understanding user needs, generation of ideas, and concept evaluation (Mehto *et al*, 2006). The focus is on methods in which participants act out scenarios to inform the design process, although comment is also made on other approaches which are influenced by drama but in which there is no acting. Although designers and other stakeholders can fulfill acting roles and insights can be obtained through this, some studies employ professional actors and theatre directors in collaboration with designers and researchers (e.g. Salvador & Howells, 1998; Howard *et al*, 2002). Previous projects and studies are presented, grouped by their main contribution to the design process. The benefits and limitations of each approach are highlighted.

The review concludes with a summary of the potential contributions from drama-based methods to various stages of the design process.

## DRAMA-BASED APPROACHES IN USER-CENTERED DESIGN

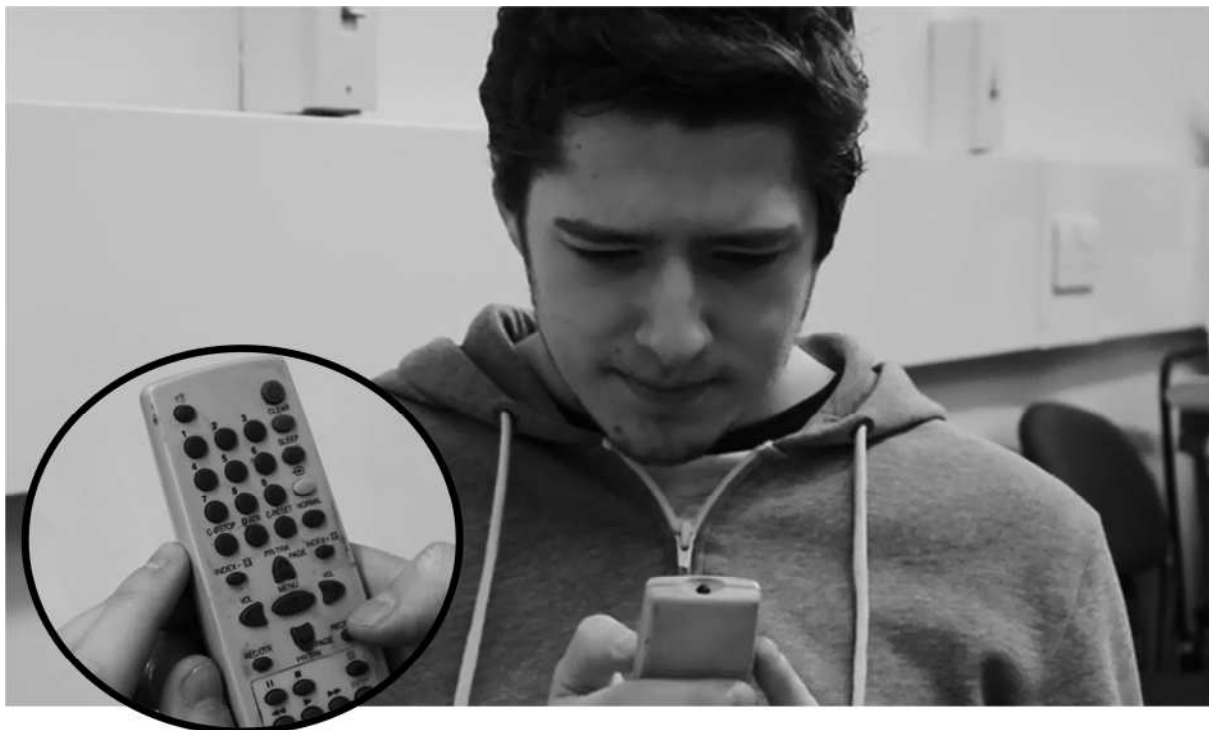
### ➤ *IMPROVISATION TO SUPPORT BRAINSTORMING*

It is widely accepted that brainstorming is a valuable method for developing new ideas from design group members (Sutton & Hargadon, 1996) but the outcomes of the method can vary greatly (Gerber, 2009). To make brainstorming effective, participants are often encouraged to follow the Osborn principles: 1) withhold judgment; 2) build on the ideas of others; 3) generate a large quantity of ideas; 4) freewheel; and 5) identify a leader (Osborn, 1953). Gerber (2009) generated activities based on improvisation exercises to help participants adhere to each of the Osborn (1953) principles. In 'Metaphor Ball', several players stand in a circle, passing a ball while completing metaphors as quickly as possible. The activity helped participants practise the skills of accepting others' ideas without any critical judgment, in accordance with principle 1), *withhold judgment*. After completing this exercise, designers were able to generate ideas from initial thoughts, produced under time pressure and without judgment. For 'build on the ideas of others' (Principle 2) Gerber proposes an activity called 'Yes, let's' in which each suggestion proposed by a designer is responded to by the group saying 'yes, let's'. Another person then adds to this with a related suggestion, thus reinforcing the principle of withholding criticism and supporting collaborative design. To *generate a large quantity of ideas* (Principle 3), Gerber (2009) suggests that three designers stand together and two of them discuss ideas. When the third hears a suggestion they dislike, they say 'new choice', and the others must generate a new idea. The focus is on the rapid generation of ideas, rather than on criticisms. For *freewheeling* (Principle 4), Gerber (2009) uses a technique in which designers pass familiar objects to one another, while suggesting possible alternative uses for this object to help designers achieve the free, unconstrained mentality necessary for effective brainstorming. Finally,

Gerber (2009) describes the importance of *identifying a leader* (Principle 5) who can draw contribution from all participants and direct the session to balance the time spent on one particular area against progressing to a new topic.

Despite the potential benefits of these improvisation-based techniques to creative ideation and collaborative design as described above, Gerber (2009) recognizes that further empirical work is needed to measure their impact on the outcome of a brainstorming session. Indeed, extra resources – such as training and staff time - would be required to implement these as part of a design process, which would need to be justified with tangible benefits. Moreover, even in traditional brainstorming sessions, participants must feel safe enough to contribute and generate novel ideas, and the improvisation-based methods may further alienate participants who are shy or otherwise less-willing to engage in these activities, which are notably different to typical office/studio working practices.

➤ *ACTING TO UNDERSTAND USERS AND CONTEXTS OF USE*





*Figures 1a and 1b. Actors recreate scenarios in which people with Dementia struggle to interact with household products to help designers understand this user group and the issues they face.*

To be successful, a design must match users' needs and be appropriate for the intended contexts of use. Understanding user needs and abilities can be difficult, particularly if the user group is not familiar to the designer (Figure 1). The designer must have empathy for the user, and drama may be a tool to help them achieve this. Brandt and Grunnet (2000) presented the method of 'frozen images' to understand users and their contexts of work, in this case refrigeration technicians tasked with servicing a device in a supermarket. Initially, users' tasks were broken down into individual components. Thereafter, designers made a physical action as a statue, a 'frozen image', related to one of the task components. The designers added dialogue and scenarios to the frozen images, informed by descriptions of characteristics of users, thus enriching their knowledge of the work and its context, as well as supporting empathy. Brandt and Grunnet (2000) progressed to have designers act out the target scenarios themselves. They dedicated a workshop area to the scenario of interest (refrigerator repair) using simple props such as boxes and chairs. Any ideas for new designs were written on Post-it notes and explored through acting out (Brandt Grunnet, 2000).

Brandt and Grunnet (2000) argue that these techniques helped the designers develop a 'bodily understanding' of the users and characters to be used within the design process, thus providing greater insight into tasks and working practices. They report how successful the props were in creating and providing a sense of the scenarios of interest, despite their low fidelity. However, they also mention concerns over the choice of props in influencing the focus of discussions, raising the concern that decisions made about the set-up of the drama-related method influencing the obtained results. The method also reflects the concerns mentioned in Section 3.1 regarding the need for additional time or resources, and for overcoming any reluctance from designers to participate as actors.

Despite these concerns, other authors have supported the use of drama for understanding contexts of use (e.g. Iacucci, 2000, Howard *et al*, 2002). In particular, the SPES Situated and Participative Enactment of Scenarios approach (Iacucci, 2000), in which designers observe users interacting with props during daily activities, aims to link direct observation of user activities with idea generation. This *designing in situation* can not only limit the effort required for data gathering activities, but also enables the designer to identify relevant contextual information to maximize the likely success of the design, and facilitate the collection of user feedback from the anticipated contexts of use (Iacucci, 2000). Howard *et al* (2002) used actors who were deliberately given difficulties to overcome during an acting session (observed by designers) to prompt generation and discussion of design ideas. They conclude that the value of the approach is in exposing the design team to 'users' and the contexts of use, including understanding the influence of location on the design in problem resolution and ideation.

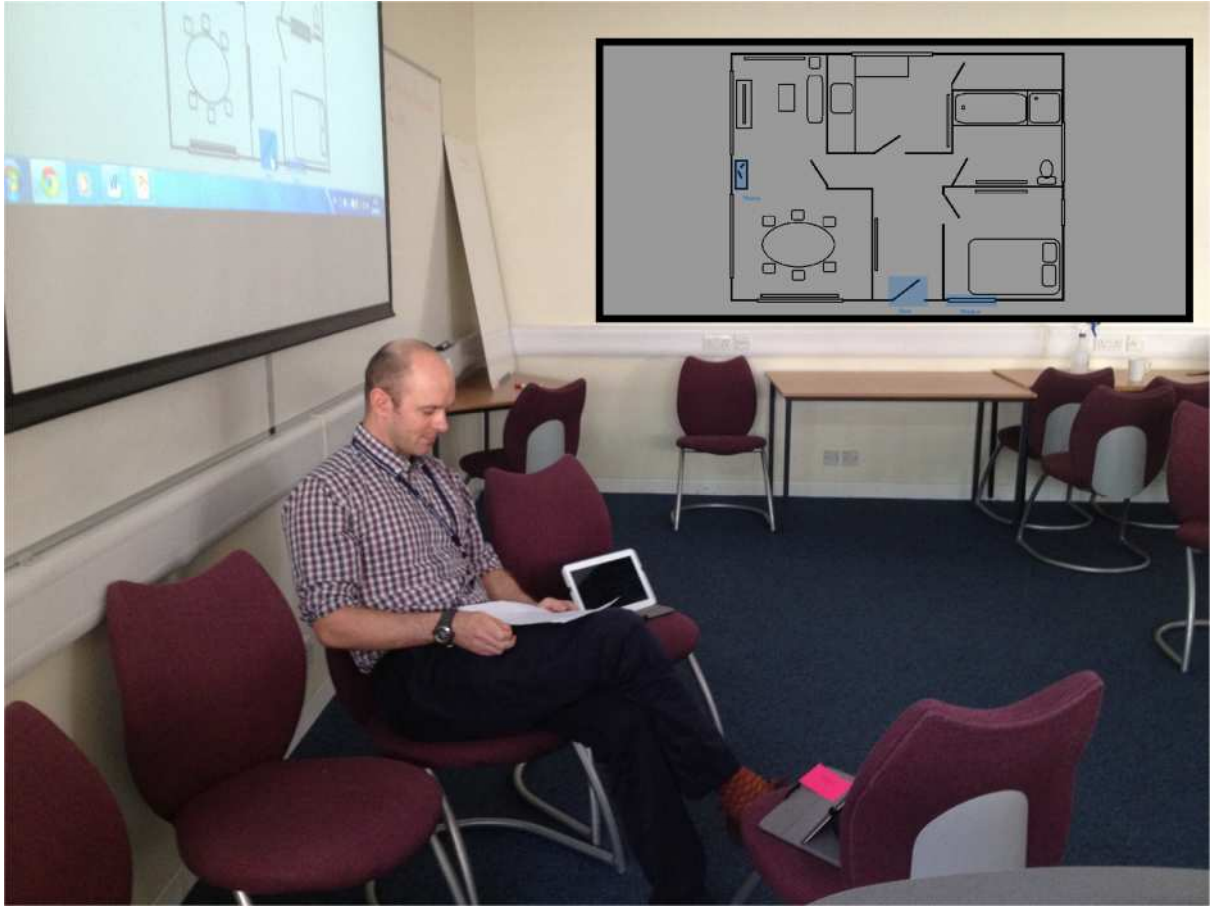
Mehto *et al* (2006) discuss the application of drama to create a more holistic approach to user-centered product concept design (UCPCD) processes, since users/participants in the drama will interact with the new technological concept at both practical and emotional levels. They explore

several types of interactive theatre, play-back theatre, drama workshops and forum-theatre, on the basis that these methods have been useful in enabling participants to envision future products which may otherwise be difficult to imagine. According to the authors, 'interactive theatre methods are powerful tools in the search for emotionally tuned information from user communities'. They argue that having users involved in a performance enables them to connect at a more personal level, increasing emotional engagement with the process. This important finding lends strength to the use of drama-based approaches, but must be contrasted against the drawback that theatrical methods may be less objective than traditional approaches to UCD, due to theatre heightening and intensifying the user's /participant's experience.

We have seen in this section how drama-related methods can help designers gain insight into users' lives with a richness of emotional and physical information that is missing from traditional written scenarios. Some methods even give designers an experience of the users' lives or environments, and an understanding of how the context may affect the success of their proposed design solution. However, the costs and resources required to implement these methods require justification, and care must be taken such that the drama does not create an unrealistic scenario through over dramatization.

➤ *PROPS FOR ENVISIONING FUTURE DESIGNS AND SUPPORTING IDEA GENERATION*

Several drama-related approaches have incorporated props to investigate user interaction or to support the creation of ideas for possible future scenarios (Figure 2)(Kuutti *et al*, 2002; Howard *et al*, 2002; Alessandrini *et al*, 2009). Eliciting user feedback on a future scenario of which users have no experience can be challenging, and drama-related methods can address this by providing users with a means to engage with the target scenario, thus increasing the quality of feedback obtained (Mancini *et al*, 2010).



*Figure 1. A researcher acts as a person with Dementia to understand interaction with a prototype technology for remote home monitoring.*

The Situated and Participative Enactment of Scenarios (SPES) mentioned in section 3.2 was originally developed to improve creativity in the design process (Iacucci, 2000; Kuutti *et al*, 2002). It facilitates designers' knowledge of user requirements and supports the generation of new ideas through a creative performance process. After initial information gathering about users, SPES involves designers following participants during daily activities. Crude mock-ups of possible future devices are provided for each participant to help them imagine their new life. In these sessions, participants act out scenarios and the designers record their activities (Iacucci, 2000; Kuutti *et al*, 2002). The intention is to prompt design ideas as the designer and user act out interesting scenarios, using the



mock-ups as catalysts for creativity or to help envision possible future scenarios involving new designs. After the performance process, designers are able to obtain new ideas and novel concepts from the participants (Kuutti & Iacucci, 2002). In a similar approach, Brandt and Grunnet (2000) provide users with props, and then visit the users' homes to generate ideas in context.



*Figure 3. This system used a range of sensors and devices to deliver a narrative representative of living with a person with Dementia, in order to support design research and ideation.*

One of the advantages of these approaches is to blur the boundaries between data gathering and idea generation activities found in traditional design approaches. The observed activities of the participant, while interacting with the design concept, inform the performance of the future scenarios and subsequently the design (Kuutti & Iacucci, 2002). Thus, the proposed concept is informed by, and to an extent evaluated in, the anticipated context of use; in this way we can test the future system which is envisaged as part of the design process.

Howard *et al* (2002) developed the “endowed props” approach to the design and development of ICT solutions. The approach starts with the design team and/or actors making a selection of a prop. These are not taken as exact representations of the proposed design – rather the actors and designers can suggest functionality for the prop. Thereafter, actors engage in a theatrical performance, in which a scenario provided by the design team is acted out under the guidance of a director, in front of the design team. The actors use the props to overcome difficulties, with the design team interjecting both difficulties and design ideas. The props keep the acting sessions focused, helping to avoid it veering into the realms of fantasy. Howard *et al* (2002) use props of several forms, such as pens, keyrings, wrist straps, blocks of wood or cardboard boxes. While they have a form, their “endowed” attributes can be described based on ideas from the design team or experts’ visions of future technologies. Howard *et al* (2002) conclude that the outcome of the process is creative product ideas, which manifest as a result of the interplay between scenario and prop. However, this approach is also beneficial in informing the design team about users and contexts of use (Howard *et al*, 2002).

Foverskov and Yndigegn (2011) look at the use of props to assist potential users in experiencing what future technology will be like to interact with, and to stimulate ideas. Foverskov & Yndigegn (2011) distinguish ‘prototypes and mock-ups’ as ‘visualizations of a product, whereas props support and trigger the performance of possibilities of the future’. One of their case studies is the development of technologies to support older people with their social networks using different sized props entitled ‘seekers’ as aids to find one another when meeting in a park. Foverskov and Yndigegn (2011) describe the props as a means to explore possible future scenarios and in particular the options for technology development in these scenarios, framed by the real experiences of the users. Thus, this approach favors explorative design work and may be more suitable when exploring routes for new product development, rather than trying to obtain more detailed and/or quantifiable data on a product concept. It also relies upon users’ ability to imagine the future scenarios, which may or

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may not be accurate. Finally, there is no validation of this process and therefore no empirical evidence that this type of approach provides tangible improvements to a product.

'ContraVision' is an approach to using futuristic videos to convey positive or negative aspects of a future technology and shares similarities with the cinematic theme of 'alternative realities', which means there are potentially a number of different scenarios which may unfold around the same central theme. In a study of a fictional technological dieting aid, Mancini *et al* (2010) analyzed focus group responses to show that using two comparable representations of a piece of technology can produce a broader range of responses than from a single representation. They raise the issue that specification of the dramatization can affect users' responses to the proposed design, and report difficulty identifying which issues were in response to the technology and which were in response to the determined scenario. However, they argue that the use of two carefully-selected and opposing scenarios is sufficient to identify the most important issues, and that the benefits of this approach for understanding user responses to future designs justify the additional resources required for preparing the scenarios.

Alessandrini *et al* (2009) used "drama prototyping" in the design of Wi-wave – a swing which tells stories (podcasts) while swinging, and which is controlled by the behavior of the swing. They used drama-based approaches to allow for the representation of children in the design process, who can be difficult to engage with directly due to the variety and unpredictability of their behavior.

Alessandrini *et al's* (2009) approach involved first writing a scenario about the design concept. This was then acted out during a first dramatization workshop in which members of the team played the roles depicted in the scenario, using cardboard and wood scale mock-ups of the Wi-wave. The process helped determine the functionality of the swing, concluding that the dramatization sessions allowed for discussion and the generation of new design ideas, particularly around social aspects and collaboration.

These examples illustrate that acting and props within the design process can support the generation of new design ideas and explore future scenarios. Drama can help users experience, and therefore provide feedback on, future scenarios of which they have no previous knowledge. This can be achieved with low-fidelity props, which may be taken into the users' environment to bridge the gap between research and ideation. The process can help generate new concepts, and support communication among the design team. It can also be used to design for particular user groups, such as children, who may be difficult to involve in the design process. However, as identified earlier, these processes can be time-consuming, and generally do not provide empirical data on which to make design decisions; they tend instead to support creative exploration of design spaces.

➤ *DRAMA TO ENGAGE MULTIPLE STAKEHOLDERS IN COLLABORATIVE DESIGN*



*Figure 4. Actors perform to stakeholders who provide input to the script. The captured footage becomes a validated resource for designers trying to understand the target user group.*

Drama-based methods can also support communication and collaboration in design. Stromberg *et al* (2004) used an interactive scenario method to enhance end-user involvement in a ubiquitous computing design project. They arranged three drama-based sessions, each with different participants. In the first session, professional actors, ubiquitous environments experts and design members were involved. The aim was to conduct an initial test of the method. On the second session, potential users sat in the audience and observed the acting and influenced it between scenes by suggesting areas of the home where the action should be set, and what events should take place. On the final session, the professional actors were left out; instead designers encouraged users to perform with them. The aim of the final session was to let designers and users act out scenarios together.

After each session, the participants were asked to fill in a questionnaire, which showed that users and experts appreciated a design process in which they could be involved. Although some users were shy to act with unfamiliar people, most found the process to be very entertaining. Moreover, designers felt that this method would work best when designing a complex system, as these can be hard to prototype but can be experienced in this drama-based approach.

Newell *et al* (2006) propose the use of theatre and performance as a particularly effective participatory design method for the inclusion of diverse user groups, such as older people. While acknowledging the use of ethnography and personas in eliciting useful feedback from participants, they point out limitations of these methods, referencing Strom's (2003) claims that 'traditional scenarios are very narrow and superficial'. Newell *et al* (2006) also quote Blomberg *et al* (2002) 'it is not always possible to know in advance just what aspects of the activity should be included in the scenario to provide generative or evaluative value for design', returning to the previously identified

issue that definition of the scenario can influence the outcome of the design method. Newell *et al* (2006) sought to promote a dialogue between the designers and the potential users and studied the concept of 'Forum Theatre' found in the work of Boal (2002). This format involves interaction between performers and audience, and therefore brings up issues during performance which are discussed and debated. They used professional actors to create scenarios of target users interacting with product concepts. The scenarios included humor and tension to engage the designers and target users who watched the videos, who reported that the process was 'interesting and enjoyable'. The authors report that due to the resources associated with this method and the use of professional actors it may be appropriate to limit it to the development of new technologies, rather than smaller iterative design evaluations. However, they mention the benefits of using professional actors in engaging the audience through dramatic and humorous performance, and in presenting the salient elements of the scenario. Forum technique was originally used to allow communities, and therefore non-actors, to participate in discussions of local importance; this indicates it could therefore be adapted to be used with stakeholders without the use of professional performers.

Several other authors (Brandt and Grunnet, 2000; Newell *et al*, 2006; Foverskov & Yndigeegn, 2011) argue that drama can be useful as an accessible means of communicating between designers and users. Drama appears to be useful to encourage participation around unforeseen futures or new technologies, and can bridge the distance between user and designer. It also appears most useful in situations where communication would otherwise be difficult, such as in international workshops where language barriers may be an issue (Fleury, 2012). Acting sessions can facilitate the communication of emotions which are difficult to convey with words (Mehto *et al*, 2006). However, participating in drama can require courage particularly among people who are not actors, as we generally communicate through words and text, rather than acting (Brandt and Grunnet, 2000). Brandt and Grunnet (2000) emphasize that to be successful, the situation for the drama must be one in which no-one is afraid to express themselves.

➤ *EVALUATION OF CONCEPTS*

Drama-based methods are not only used for generating new ideas, but can be used for the evaluation of concepts. Brandt and Grunnet's (2000) scenarios and ideas were ultimately presented to a selection of end users, in this case refrigeration engineers, who acted as critical directors/spectators (spectators who actively participate), in accordance with the Forum Theatre approach (Boal, 2002). The engineers were able to provide missing information to the designers, as well as change the direction of their designs such as adding functionality. They valued the opportunity to provide input to the process. However, Brandt and Grunnet (2000) recognize limitations in the process in that the designers had determined the scenario and original functionality of the proposed designs, and therefore question the influence afforded to the users.

Salvador and Howells (1998) created a technique to elicit contextually relevant feedback for systems which have not yet been developed, in recognition that traditionally approaches to user-centered design have limited value when evaluating a product of which the users have no experience. They applied the following proposal to evaluate a product for video camera communications during real estate sales:

1. The moderator introduces a new concept of a product with "one slide for about one minute"
2. Video sections of the vignette – interaction between actors are shown to the audience.
3. The audience discusses the information, involving "neutral questions for information and clarification".
4. A new character describes a positive response to the product, followed by discussion.
5. A further character describes a negative response, again followed by discussion.
6. Audience members then give their responses individually and show their likelihood as to whether they would want to purchase such products.

Salvador and Howells (1998) report the outcomes from this process, including identification of other possible applications for the proposed technology, identification of technological issues, and issues of acceptance from the audience. Importantly, they also report that the results were speedier and more efficient than that of the related Focus Group method, as the use of vignettes meant that minimal props were required and this resulted in less time being spent on preparation. The use of shared contexts and concepts removed any misunderstanding or confusion from the audience. Moreover, the value of the 'shared experience' led to a desire among the audience members to track the progress of the product concept (Salvador and Howells, 1998).



## SUMMARY OF CONTRIBUTIONS TO DESIGN FROM DRAMA-BASED METHODS

The previous sections reviewed the current literature on drama-based design methods. These are summarized in Table 1 below, which also lists the design activity which they best support.

**TABLE 1: SUMMARY OF DRAMA METHOD CONTRIBUTIONS TO DESIGN, ORGANIZED BY DESIGN ACTIVITY**

Design Activity	Drama Method	Contribution to design	References/ Further Reading
Brainstorming	Improvisation activities	More effective and reliable brainstorming	Gerber (2009)
Understanding users and (future) contexts of use	Frozen images	Moving from intellectual to physical appreciation of user and their work.  Confirming common understanding of users.	Brandt and Grunnet (2000)
	Acting out how characters respond to situations	“bodily understanding” of users  Creation of characters to be used within design process.	Brandt and Grunnet (2000)
	Creating mock ups of the scenario of interest	Understanding of users and empathy  Idea generation	Brandt and Grunnet (2000)
	SPES (Situating and Participative Enactment of Scenarios)	Link observation of users with idea generation.  Identify relevant contextual info.	Iacucci (2000)
	Giving actors difficulties to overcome while being observed by designers	Generation & discussion of design ideas  Exposure to issues and contexts	Howard <i>et al</i> (2002)
	Application of drama/dramaturgy to user-centered product	Drama methods ‘deepen the designers’	Mehto <i>et al</i> (2006)

Design Activity	Drama Method	Contribution to design	References/ Further Reading
	concept design (UCPCD)	involvement' and 'improve understanding of user communities' behavior'.	
	'Forum theatre' techniques	To create emotional/empathetic immersion. Good for the inclusion of diverse groups such as older people, and promote visualization of future concepts for those less familiar with technology	Newell <i>et al</i> (2006)
Early design process	Scenario dramatization technique	Good for prototyping as focuses discussion on specific design issues tailored to specific audience. Especially good in designing for children	Alessandrini <i>et al</i> (2009)
Concept development	Role games in participatory design	To create a 'common language'  Helps simultaneously to visualize mobility, different contexts, activities and interactions.	Iacucci <i>et al</i> (2000)
	Video, using both negative and positive representations of same product. Based on <i>alternative realities</i> or parallel stories unfolding in different ways (popular cinematic theme)	Obtain a broad range of responses to a proposed technology	Mancini <i>et al</i> (2010)
	Drama and props in user centered design	Bridging the gap between designers and users; drama can be an accessible means of communication	Brandt & Grunnet (2000)

Design Activity	Drama Method	Contribution to design	References/ Further Reading
	Endowed props in scenario-based design – role playing.	Understanding the impact of a design.  Linking the scenario and the technology.	Howard <i>et al</i> (2002)
	Scenario dramatization	Good for aiding users in seeing the possibilities in their lives through scenarios with new technology	Foverskov & Yndigeegn (2011)
Evaluation	Use of dramatic ‘vignettes’	Demonstrates use of visualized product in context and gathers user input.	Salvador & Howells (1998)
	Forum Theater	Users act as critical directors / spectators to guide design	Brandt & Grunnet (2000)
Engaging multiple stakeholders in collaborative design	Interactive scenario building (includes role-play, drama, improvisation)	Engaging users and experts in design.	Stromberg <i>et al</i> (2004)

## DISCUSSION

Using drama-based methods appears to bring several benefits to design which would be difficult to obtain through traditional approaches.

Firstly, new ideas can be developed in a participative and situated way to enhance understanding of scenarios. In traditional design approaches, scenarios are developed in the studio following field studies or brainstorming. However, in drama-based approaches, those involved can become more deeply and actively engaged in the scenario with the help of conceptual props. Moreover, details of personal life practices, such as comparing prices when shopping, can be represented and acted out. This is consistent with Iacucci *et al* (2000) who argue that scenarios extracted from drama methods can provide more detail as it is possible to obtain such rich information in a realistic context.

Howard *et al* (2002) emphasize the importance of props, stating that they play a significant role in the acting sessions, becoming 'the conduit between context and action'. Several of the reviewed projects (Kuutti *et al*, 2002; Howard *et al*, 2002) have used some form of prop to illustrate their concept or ideas.

Secondly, drama-based methods can enhance understanding of emotional needs. Norman (2005) argues that emotional needs are key design requirements and are difficult to capture, even by users themselves. Drama methods can explore the emotional needs of users, and therefore the end-products can address more emotional elements. While users could provide similar design requirements content in traditional sessions such as interviews or focus groups, acting the stories in a drama-based workshop can provide the opportunity for the capture of more emotional detail through embodiment.

Thirdly, drama-based methods can help generate new ideas through a creative performative process. One aspect of this is improving brainstorming through improvisation training. Gerber (2009) posits that through the use of drama-based techniques such as theatrical improvisation, the quality and effectiveness of brainstorming sessions can be improved. The second aspect to the creation of new ideas was shown in the SPES example (Kuutti, *et al*, 2002) in which participants had some creative freedom to perform their life with the help of mock-up devices. This freedom provided users the catalyst to create new ideas within a comfortable environment, which may not have been achieved if, for example, they were asked to conduct a user study in a clinical meeting room environment.

Finally, drama-based approaches provide the opportunity for all stakeholders to be involved in the design process, and in some cases for designers and users an opportunity to collaborate. The drama session or workshop could be a new "voice" in user-centered design as it provides an appropriate way of building the bridge between designers and users. Gerber (2009) argues that drama is

particularly suited to supporting communication in complex design projects, as it creates opportunities for all stakeholders to work together. Stromberg *et al* (2004) support this, arguing that improvisation is good for understanding context, identifying users' needs and for testing ideas generated. Moreover, acting provides a platform for body language, an important aspect of communication which is often neglected by traditional approaches, to be observed and captured within the design process. A final opportunity for enhancing communication is through use of drama games such as "ice-breaker" type activities.

It should be noted that drama-based methods are not appropriate for every project or are not suitable for every participant (Stromberg *et al*, 2004). Many people find acting challenging and it would be inappropriate to force them into it. Skillful and experienced actors can be essential for some approaches, and preparation activities can be necessary during the implementation of drama methods. For example, in the Interactive Scenario Method (Stromberg *et al*, 2004), designers used techniques to help relax participants and develop their acting technique. Additionally, props can go some way to increase confidence in non-confident actors.

Compared to quantitative and even some qualitative methods, the data present difficulties with collection and analysis. Drama methods are often dynamic processes, thus the issue of how to capture all words, comments and interactions becomes of interest. Recording tools need to be carefully prepared. When conducting international research or design work, cultural and linguistic differences may need to be addressed. Fleury (2012) found when conducting studies using drawings and drama workshops that Japanese (child) participants went into greater detail than their American counterparts, with the conclusion being drawn that 'these differences are explained by cultural clues of how children are raised in both societies'. The authors also observed differences between Japanese and Danish participants when investigating the emotional relationship between users and their mobile phones and TVs.

Despite the potential successful outcomes, further research work is required to empirically prove the effectiveness of these techniques. The majority of the reviewed applications of design-drama methods present no attempt to validate their improvement over traditional approaches. Given that most methods require greater resources, future work needs to determine whether these costs can be justified, particularly in today's marketplace in which companies are under pressure to reduce design cycles and time to market.

## CONCLUSIONS

Drama-based methods can bring about positive effects in the user-centered design process. This review has presented examples of user-centered design methods which draw upon acting techniques to improve the design process. Benefits have been outlined as well as the risks where appropriate preparation is not put in place. The main benefit of adopting drama-based techniques would appear to lie in the added dynamism of embodiment and therefore the possibility of a more connected emotional experience for everyone taking part. Meaning is therefore more easily elucidated to the audience and between participants. The staging of an acted scenario also provides context and this is invaluable in demonstrating the various situations in which a potential device or product might be used, again facilitating a clearer understanding of the prototype and its advantages. Acting also provides an opportunity for participants to tap into their creative side, thus promoting the generation of new ideas free of the constraints of a more traditional approaches.

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## REFERENCES

- Alessandrini, A., Rizzo, A., and Rubegni, E. (2009). 'Drama prototyping for the design of urban interactive systems for children'. In: Proceedings of The 8<sup>th</sup> International Conference on Interactive Design and Children. Milan, Como, Italy, 3-5 June 2009.
- Blomberg, J., Burrell, J.M., Guest, G. (2002). An ethnographic approach to design. In: Jacko, J., Sears, A. (Eds.), *The Human-Computer Interaction Handbook*. Mahwah, NJ, Lawrence Erlbaum.
- Boal, Augusto (2002). *Games for Actors and Non-Actors*. London:Routledge.
- Brandt, E. and Grunnett, C. (2000). 'Evoking the future: Drama and props in user centered design'. In: T Cgerkasky, J Greenbaum, P. Mambrey, J K Pors (Eds.) In: Proceedings of the Participatory Design Conference.. New York, NY, USA. 28<sup>th</sup> November-1<sup>st</sup> December 2000.
- Brown M., Pinchin J., Blum J., Sharples, S., Shaw, D., Housely, M., Jackson S., Flintham M., Benning K., Blakey, J. (2014). 'Exploring the Relationship between Location and Behaviour in Out of Hours Hospital Care'. *HCI International*, Crete, 22-27th June, 2014.
- DeBono, E. (1985) *Six Thinking Hats*. Boston, MA: Little, Brown & Company.
- Ehn, P., Sjorgren, D., (1991). From system descriptions to scripts for action. In: Greenbaum, J., Kyng, M. (eds). *Design at Work: Co-operative Design of Computer Systems*. Hillsdale, New Jersey, USA: Lawrence Erlbaum Associates.
- Fleury, A. (2012). 'Drawing and Acting as User Experience Research Tools'. In: *Proceedings of the 10<sup>th</sup> Asia Pacific Conference on Computer Human Interaction*. Matsue-city, Shimane, Japan, 28-31 August 2012.

Foverskov, M. and Yndigejn, S.L. (2011). 'Props to evoke 'The New' by Staging the everyday into future scenarios'. In: *Proceedings of Participatory Innovation Conference, 2011*. Sønderborg, Denmark, 13 - 15 January 2011.

Gerber, E. (2009). 'Using Improvisation to Enhance the Effectiveness of Brainstorming'. In: *Proceedings of Human Factors in Computing Systems 2009*. Boston, MA, USA, 4-9 April 2009.

Guillemin, M., (2004). 'Understanding Illness: Using Drawings as a Research Method'. *Qualitative Health Research* 14(2), 272-289.

Howard, S., Carroll, J., Murphy, J. and Peck, J. (2002). 'Using 'Endowed Props' In Scenario-Based Design'. Interaction Design Group, Department of Information Systems, The University of Melbourne, Australia.[Working paper]

Iacucci, G. (2000). *Concept Design for Mobile Services and Devices Leveraging on Situatedness and* Svensson, L., Snis, U., Sorensen, C., Fagerlind, H., Lindroth, T., Magnusson, M. Ostlund, C. (eds). 'User Participation'. In: *Proceedings of the 23<sup>rd</sup> Information Systems Research Seminar*. Langatan, Sweden 12-15 August 2000.. Laboratorium for Interaction Technology, University of Trollhattan, Uddevalla.

Iacucci, G., Makela, A., Ranta, Mervi and Mantyla, Martti (2000). 'Visualising Context, Mobility and Group Interaction: Role Games to Design Product Concepts for Mobile Communication'. In: *Proceedings of the 2000 ACM conference on Computer supported cooperative work* Philadelphia, Pennsylvania, USA, 23-26 May 2000.

Kuutti, K., Iacucci, G. and Iacucci, C. (2002). 'Acting to Know: Improving Creativity in the Design of Mobile Services by Using Performances'. In: *Proceedings of the Fourth International Conference on Creativity and Cognition, ACM Press, (2002)* Loughborough, Leicestershire, UK, 14-16 October 2002.



Maguire, M., and Bevan, N. (2002). User Requirements Analysis: A Review of Supporting Methods. In: *Usability: Gaining a Competitive Edge IFIP World Computer Congress*. J. Hammond, T. Gross, J. Wesson (Eds). Montreal, Canada, 25-29 August 2002. Published by Kluwer Academic Publishers.

Mancini, C., Rogers, Y., Bandara, A.K., Coe, T., Jedrzejczyk, L., Joinson, A.N., Price, B.A., Thomas, K. and Nuseibeh, B. (2010). 'ContraVision: Exploring Users' Reactions to Futuristic Technology'. In: *Proceedings of ACM Human Factors in Computing Systems* Atlanta, Georgia, USA, 10-15 April 2010.

Mehto, K., Kantola, V., Tiitta, S. and Kankainen, T. (2006). 'Interacting with user data – Theory and examples of drama and dramaturgy as methods of exploration and evaluation in user-centered design'. *Interacting with Computers* 18, 977-995.

Muller, M.J., Wildman, D.M., White, E.A., (1994). 'Participatory Design through games and other group exercises'. In: *Proceedings of ACM CHI '94 Human Factors in Computing Systems Conference*. Boston, Massachusetts, 24-28 April 1994.

Nielsen, J. (2004). *Emotional Design: Why We Love (or Hate) Everyday Things*. Basic Books, New York.

Newell, A., Carmichael, A., Morgan, M. and Dickinson, A. (2006). 'The use of theatre in requirements gathering and usability studies'. *Interacting with Computers* 18, 996-1011.

Norman, D. (2005). *Emotional Design: Why We Love (or Hate) Everyday Things*. New York, USA: Basic Books.

Osborn, A., (1953). *Applied Imagination: Principles and Procedures of Creative Problem Solving*. New York, USA: Charles Scribner's Son.

Ryan, M.L., (2001). *Narrative as Virtual Reality – Immersion and Interactivity in Literature and in Electronic Media*. Baltimore and London: The John Hopkins University Press.

Salvador, T. and Howells, K. (1998). 'Focus Troupe: Using Drama to Create Common Context for New Product Concept End-User Evaluations'. In: *Proceedings of Human Factors in Computing Systems. Los Angeles, CA, USA. 18-23 April 1998.*

Strom, G., (2003). 'Perception of human-centred stories and technical descriptions when analyzing and negotiating requirements'. In: *Proceedings of the IFIP TC13 Interact 2003 Conference.*

Stromberg, H., Pirttila, V. and Ikonen, V. (2004) 'Interactive scenarios – building ubiquitous computing concepts in the spirit of participatory design'. *VTT Information Technology, Sinitaival 6, Tampere, Finland.*

Sutton, R. I., & Hargadon, A. (1996). 'Brainstorming groups in context: Effectiveness in a product design firm'. *Administrative Science Quarterly*, 685-718.

Wu, Y., and Chen, H.Q., (2009). 'The Characteristics of Artistic Research at Information Age'. *Theory Monthly*, 08(07), 125-127.