Enhancing Collective Creativity with Enactment: A Comparative Study of Design Research Methods

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Abstract

This research explores how dynamically moving one's body as a means of creating meaning and imaging the new can impact one's creative abilities and expression. The behavior and creative output of small groups of people engaged in creative sessions were investigated. They explored the question “What’s next?” using one of four methods:

~ Traditional focus group
~ Image collaging\(^1\)
~ Sandquery\(^2\)
~ Enactavision\(^3\)

People’s use of the three participatory methods (image collaging, Sandquery and Enactavision) was compared to the control condition (traditional focus group). Each method followed a similar script and used the same activities and post-session questionnaire. Triangulation of data using several measurement techniques was performed because of the exploratory nature of the research. Analysis focused on where similarities and differences occurred when comparing dynamic body movement and collectively creative (Sanders, 2012) expression.

This research shows that small groups of people who make meaningful movements, play pretend, or enact while thinking and generating creative possibilities produce more creative output than do people who brainstorm together with minimal body movement.

Keywords
Creativity, Enactment, Participatory design, Generative tools, Methods

Introduction

This research demonstrates that enactment and embodied cognition can be seen as a powerful means to unlock creative and collective expression in small groups. Activities designed to create meaning and imagine the new are more effective when they are more embodied, kinesthetic (Gardner, 1983) and playful than the more traditional and static or reserved methods used for design research.

Collective creativity will play an important role in everyone's future. Because wicked problems (Rittel and Weber, 1973) require transdisciplinary (Nicolescu, 2002) teams to envision possible futures, collective creativity will be used to inform and inspire innovation and the solving of very complex problems. Having research that endorses an attitude of physical activity and playfulness as fundamental in the generative phase of the design process brings attention to the unique benefits of co-designing with people.

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\(^1\) The image collaging method uses paper, scissors, glue and the provided images and printed words as tools.

\(^2\) The Sandquery method uses sand, a wooden box called a sand tray, and the provided toys and objects as tools.

\(^3\) The Enactavision method uses the Kinect, a wall, a projector, two computers, a touchscreen and the Enactavision application as tools.
In a world that has traditionally relied on verbal research methods, we engage people to express needs, wants, and dreams for the future. "In broad terms, a focus group is a carefully planned discussion, designed to obtain the perceptions of the group members on a defined area of interest" (Langford and McDonagh, 2003). But how does communication in a design research context expand in depth and breadth when people are given tools with which to build, visualize, embody, and enact their expressions? This paper reports on a small research study that compares and contrasts a traditional market research method to three participatory design research methods.

Understanding more about embodiment could impact the future direction of design and design research. People's stories about the past, present, and future propel design towards improvement and also inspire the new. The stories people choose to tell in a design research setting hinge on many facets, including their personalities and even how they might be feeling on a particular day. However, this paper supposes that if we could collaborate and build in a space of shared meanings, then design research results can expand beyond a collection of individual tastes and opinions, to a place of collectively imagining the possible.

Embodied interactions help shape our understanding of the world. Klemmer and Takayama researched "How Bodies Matter" in the context of themes for interaction design. In their 2006 paper, they describe the relationship between the world and embodied experiences, communication, and interactions. "Our physical bodies play a central role in shaping human experience in the world, understanding of the world, and interactions in the world" (Klemmer and Takayama, 2006, italics in original).

A field study of designers designing cooperatively asserts, "Whatever the designers did was accomplished not just by internal cognitive processes, but by different combinations of their purposeful, embodied actions" (Robertson, 1997). Providing designers with creative tools while designing impacts collaboration. "Cooperation was achieved by the mutual perception, by the actor and others, of these actions as the basis for the ongoing creation of shared meaning" (Robertson, 1997). Our embodied actions enable us to create and maintain shared meaning with others.

Woven into our sense of touch, sight, and sound, play is often an embodied experience. When playing, we re-enact what we've seen or done before. Or we can enact our dreams, wishes, or hopes, strategizing for more positive futures. "Humans have a need and desire for play to free creativity, inner feeling, perceptions, and memories and bring them into outer reality" (Boik and Goodwin, 2000). Playing can also bring out the exploration of worst case scenarios, and sometimes include how the people in the story cope, adapt, and heal – or die.

![Figure 1: The Participatory Prototyping Cycle, Sanders 2013.](image-url)
As illustrated in Figure 1, the “Participatory Prototyping Cycle (PPC) is a framework for action and a model for co-creation in design” (Sanders, 2013). It is through iterations of making, telling and enacting, that fictional characters with an imagined voice can emerge. In these fictions, characters may walk, talk and interact with other made objects or characters within a scene. People “enact” these characters within the stories of a pretend world. As an example of enactment, a main character might “feel scared” of another character in a scene, say “Agggh!,” and move quickly to safety, away from the danger. The iterative cycle of “make, tell, and enact” is effective for high-level emotional, creative, and sometimes innovative expression. People are free to play openly, to explore and express via iteratively making, telling, and enacting with a built artifact that they create. The methods that evoke cycles of making, telling and enacting all have value along the design process.

People making, telling, and enacting together invite non-designers to contribute to the design process. Designers have tools and techniques to communicate that are not accessible to many non-designers. Therefore, “participatory design today spans across a broad spectrum of domains and makes use of a broad repertoire of tools and techniques in both commercial, community oriented and research contexts” (Sanders, Brandt, & Binder, 2010).

No matter the goal or function of a future design, imagining the new plays a role in the process of each design. A big debate that this study explores is how participatory tools might affect teams to be more collectively creative. What are the tools, techniques and methods that help people collectively imagine the new? “People are naturally creative. What participatory tools can we give them to promote generativity in their thinking? (Sanders, 2000).

Including tools with a design research activity potentially opens up a wider set of possibilities for engaging and participating. This paper focuses on design as a means of creating meaning and imaging the new rather than solving problems. What we choose to communicate in a group hinges on our willingness to expose ourselves. People in a mostly verbal activity, such as a traditional focus group, have opportunity to share their thoughts and feelings, but who knows exactly how much goes unsaid as a means of self-preservation? As design researchers, we search for methods that help people open up and honestly express their deepest hopes, dreams and fears. We look for ways to invite people to be creative, work collaboratively and imagine the new. Before the insights from this study are shared, its methods, process, analysis will be described briefly.

**Process**

The intentionally open question “What’s next?” was explored by 12 groups, three people per group, using four different design research methods. First, each team was given the question, then each team worked together to imagine a response to the question.
As illustrated in Figure 2, people in the focus group sessions worked together and then presented their ideas and possible solutions to the main question, “What’s next?” by discussing it with their teammates. The tools included pens and paper.

As shown in Figure 3 above, the people engaged in image collaging sessions worked together and then presented their ideas and possible solutions to the main question by using materials (e.g., paper, scissors, glue and the provided images and printed words as tools).
As shown in Figure 4 above, people who engaged in Sandquery sessions chatted with their teammates while moving objects with their hands. Sandquery materials include sand, a wooden box called a sand tray, and the provided toys and objects as tools.

As shown in Figure 5 above, people playing in Enactavision sessions talked with their teammates while moving virtual objects with their hands and bodies. Enactavision uses the Kinect, a wall, a projector, two computers, a touchscreen and the Enactavision application as tools.

Depending the method, teams worked independently and/or collaboratively to make written, visual, and/or kinesthetic artifacts. Then each team presented their interpretation of “What's Next” via telling.

After each session, each person individually evaluated the activity and had an opportunity to grade each stage of the activity in terms of a positive, neutral, or negative experience. This post-session evaluation gave insight into how collaborative and/or creative each person felt while engaged in the activity.
Figure 6: The experience reflection chart. Building is also referred to as “making” and “exploring the main topic”. Presenting is also referred to as “telling”.

As seen in Figure 6, a word bank was provided to the left side of the experience reflection chart as a sample of words that could be used with which to fill out the chart: fun, boring, engaging, collaborative, visual, stimulating, creative, shy, self-conscious, confident, and happy. People chose from the word bank and also wrote in additional words that were not in the word bank to describe their experiences throughout each part of the activity. The thin horizontal line through the middle of the chart represents a neutral experience. People wrote words above the neutral line to describe a positive experience. When people wrote a word below the neutral line, they shared a negative experience or emotion. The experience reflection chart gave opportunity for people to give private feedback about how they felt about the different phases of the activity, notably the “making” and “telling” parts of the activity. How people felt during the activity relates to how much they are willing to express. For instance, fun may affect one's openness to sharing new and original feelings and ideas. Fun and engagement may also impact one's intrinsic motivation to think outside the box and imagine the new.

For the sake of brevity, the methods explored in this study are not discussed in detail but can be found in Strouse’s 2013 thesis, Collective Creativity through Enacting: A Comparison of Generative Design Research Methods. Both Sandquery and Enactavision are new methods designed and developed by the author. The methods chosen for comparison use different combinations of making, telling and enacting, as shown in Figure 7:

<table>
<thead>
<tr>
<th>method</th>
<th>make, tell, enact</th>
</tr>
</thead>
<tbody>
<tr>
<td>focus group</td>
<td>tell</td>
</tr>
<tr>
<td>image collaging</td>
<td>make, tell</td>
</tr>
<tr>
<td>sandquery</td>
<td>make, tell, enact (using hands)</td>
</tr>
<tr>
<td>enactavision</td>
<td>make, tell, enact (using the body)</td>
</tr>
</tbody>
</table>

Figure 7: The methods chosen for comparison use different combinations of making, telling and enacting.
The traditional focus group is primarily a “telling” activity; image collaging consists of “making” and later a “telling” activity. Sandquery includes combinations of “making”, “telling” and “enacting” using hands. Enactavision combines “making”, “telling”, and “enacting” using the whole body.

As illustrated in Figure 8, a total of 36 people participated in this study with three people making up each group. The research design was a between-subjects experimental design with a control group (focus group) and three experimental groups: the participatory design research methods of image collaging, Sandquery and Enactavision. One within-subjects round followed the 12 sessions, i.e., three people participated as one team with all four methods.

**Analysis**

Analysis was rigorous: videos were viewed many times and transcripts were carefully studied. Analysis of the data was challenging because of its wide variety and large quantity. For example, the data included behavior/body language, verbal protocols, emotional output, movement, choice of props, responses to the post-session questionnaire, etc. Spreadsheets were made to organize the data. The purpose of organizing all the data consistently was to find where there appear to be threads of similarity and difference between the four methods. Some of the data comes directly from the people who participated in the study. The post-session questionnaire graded the experience of each method from the perspective of the people who were engaged in the activities. When a person reported that a method was "creative" or "collaborative" on their post-session questionnaire, this impacted the method's rating of creativity and collectivity. On the other hand, when it was reported that an activity made one feel "self-conscious", and "uncomfortable", this negatively impacted that given method's score for creativity and collectivity.
Results
The following summaries detail the threads of insight arising from a comparison of the data obtained from one method from the next.

Focus Group
The focus group method evoked:
• A personal/individualistic kind of telling
• Mostly telling about personal futures
• Present to long-term futures
• Mostly realistic telling
• Occasional creativity
• A medium level of fun and engagement

Assessment of movement and behavior during the focus group method showed:
• Minimal hand and body movement
• Individualistic behavior

The focus group method stimulated the highest amount of reported negative experience from the post-session questionnaires. Descriptive words used for the "building" (exploring the main topic) and "presenting" include: “uncomfortable”, “fearful”, “self-conscious”, “shy”, and “differences in opinion quickly surfaced”. For all three focus group sessions (which included nine people), the word "creative" was used in the experience reflection charts three times, and only in focus group session two, which was indeed more creative than focus group sessions one and three.

Image Collaging
The image collaging method evoked:
• A strong focus on community and spirituality
• Present to very long-term futures
• Mostly collective community, global and spiritual futures
• Telling set in both fantasy and reality
• Creative insights
• A medium level of fun and engagement

Assessment of movement and behavior during the image collaging method showed:
• Regular hand movement during the “making” part of the activity
• Minimal body movement
• Collective behavior

Of the nine people engaging with the image collaging method, only one negative experience was reported from the main presenter of image collaging session one. This is perhaps because the responsibility of being the main presenter can make one self-conscious; as sharing verbally can feel exposing. Positive experiences described for image collaging during the "building" (exploring the main topic) and "presenting" parts of the method include: “collaborative”, “meditative”, “engaging”, “creative”, “visual”, “stimulating”, “fun”, and “confident”. The words "fun" and "creative", both used five times, describe the "exploring the main topic" and "presenting" parts of first-round image collaging sessions.

Sandquery
The Sandquery method evoked:
• A strong focus on the personal and the spiritual
• Representations of past, present and future
• Present to long-term futures
• Collaboration during both the making and telling parts of the activity
• Telling set in both fantasy and reality
• Creative insights
• Story as the main style of telling
• A high level of fun and engagement

Assessment of movement and behavior during the Sandquery method showed:
• Regular hand movement during the “making” part of the activity
• Minimal body movement
• Collective behavior

One of the people in Sandquery session two reported that he felt "self-conscious" during the "presenting" part of the session. Words used to describe Sandquery during the “exploring the main topic” and “presenting” parts of the first-round Sandquery session include: “visual”, “creative”, “interesting”, “stimulating”, “collaborative”, “fun”, “exploratory”, “finding-language”, “happy”, and “engaging”. During the “exploring the main topic” and "presenting", the word "fun" was used five times to describe these parts of the activity. "Creative" was used six times to describe the latter two stages of the first-round Sandquery sessions.

Enactavision

The Enactavision method evoked:
• A strong focus on the personal and the spiritual
• Representations of past and future
• Expressions of very long-term futures
• Collaboration during both the making and telling parts of the activity
• Telling set in fantasy
• Creative insights
• Story as the main style of telling
• A high level of fun and engagement

Assessment of movement and behavior during the Enactavision method showed:
• Active hand and body movement during the “making” part of the activity
• Less active hands and body during the “telling” part of the activity
• Collective behavior

People reported that the Enactavision method evoked a positive experience, as there are no negative descriptions from any of the nine people in the three, first-round sessions. Words used to describe the "exploring the main topic" and "presenting" parts of the Enactavision method include: “collaborative”, “stimulating”, “complex in an exciting way”, “fun”, “creative”, “freeing”, “confident”, “engaging”, “expressive”, and “proud”. During the "exploring the main topic" and "presenting" parts of the three Enactavision sessions the word "fun" was used six times and twice with an exclamation point after the word, "fun!". "Creative" was used five times to describe the "exploring the main topic" and "presenting" parts of the three Enactavision sessions in the first-round.

The collective creativity of these four methods is compared visually in Figure 9:
Of the four methods compared in this study, the focus group method evokes the least amount of collective creativity. The image collaging method evoked more creative results than the focus group, but was about the same as the focus group in terms of collectivity. The Sandquery method evoked more creative kinds of telling than the focus group and image collaging methods. The creative telling of Sandquery sessions were often generated collectively, as evidenced by team members finding shared meaning and expressing the meaning through collaborative quotes. The following is an example of a collaborative quote from Enactavision Session Two. In this group of three, two group members collaboratively describe part of the virtual scene created. Female 1 said: “And the compass represents...” Male 1 expands on Female 1’s idea by saying: “She can go anywhere...” Female 1 then completes the thought by adding: “…The fact that space and time have been collapsed into one thing.”

The Enactavision method ranked as the most creative and most collective of all the methods compared in the study. This is due to the creative telling of the Enactavision sessions that were usually generated first through collaborative making, which established shared meanings within the virtual scene. According to this comparative study, dynamically moving one’s body while problem-finding and problem-solving in a group appears to enhance both creative abilities and collective behavior within a group.

Which methods may or may not open up channels of creative expression? It seems there is a relationship between having access to objects, space in which to move one’s body, and creative expression. The ability to manipulate objects with the body via movement seems to impact collective creativity. A guess as to why objects and interaction impact a group’s ability to be collectively creative rests in finding and assigning shared meaning in space and for objects that everyone in the group can understand. When people have the opportunity to make and enact, relationships between different concepts can develop visually, spatially and kinesthetically. Through the interaction of shared meanings, a group is more able to make new and original connections and is more able to be collectively creative together.
Implications

If your aim is to get a group to be creative together and imagine the new, this study suggests methods that use “enactment” as the lead activity are most appropriate in the front end of the design process, or pre-idea space. During the earliest stages in the design process, using enactment as the lead activity is ideal because “the focus is on understanding and exploring experience” (Sanders, 2013).

Collecting, analyzing and reporting on people’s experience while engaged with the four methods compared in this study verify the findings. The focus group method seems to be the odd one out, evoking a less positive experience than the participatory methods. This confirms the fact that the combination of enough space to meaningfully move one's hands and body as well as access to objects and various materials impacts one's creativity in a group. Interaction with objects may increase collective creativity due to a group of people collaboratively making, telling, and enacting with objects of shared meaning. It is also clear from the experience reflection charts that the participatory methods are more fun than the focus group method. Traditional focus groups have been used and will continue to be used for design research because they’re an efficient and cost-effective way of including various stakeholders throughout the design process. The focus group method provides a stage for the expression of an individual’s personal opinions, goals, hopes and fears. However, as a researcher in the front end of the design process, if one intends to host a focus group to brainstorm new, creative and innovative ideas that will delight and surprise a client, the results of this study suggest that what people choose to creatively express via the focus group method is limited.

What about the three participatory methods? Image collaging is a great way to get people to be creative both independently and together. The image collaging sessions in this study evoked some collective creativity even though much of the behavior throughout the session appeared to be more individual than collective. People shared big dreams via the image collaging method; and with colorful images, paper and words set in place after the “making” part of an image collaging session, the team collaboratively described each part of the collage very passionately but sometimes minimally and cryptically.

Sandquery is a great way to get people to tell stories about the past, present and future. If little is known from the people side of a design issue or problem, Sandquery, or other visual-kinesthetic methods may be a good choice, as Sandquery was the most verbal of all of the methods explored in this study. For whatever reason, people were most comfortable telling, iterating and elaborating again and again collectively using the Sandquery method. This is evidenced by the very long transcripts from each Sandquery session. Sandquery gets people thinking and talking collectively.

Enactavision, as the most experimental of the methods compared, renders some interesting implications that may be of use to other exploratory design researchers who experiment with embodied virtual tools and methods. People involved with the Enactavision sessions listed few problems and opportunities, and the transcripts are extremely short. However, Enactavision is highly collective and evokes more clear examples of creativity than the other methods compared in this study. More testing is needed to validate this result, as the participant pool was small. Interestingly, Enactavision led people to tell stories that were set in the very, very distant future. All the stories were more fantasy-based than reality-based. Very-long term future scenarios could be valuable because as Sanders and Stappers suggest in their book, “Design involves imagining and creating new life situations for people in circumstances that have never been experienced before” (Sanders & Stappers, 2012). Enactavision gets one's mind and body working on the same task and evokes pretending and enacting. In so doing, the Enactavision method can host physical interaction combined with collective behavior and, in turn, inspire collective creativity.
**Next Steps**

Of the four methods in the study, the findings and results of Enactavision elicited very unique responses from people: the brief telling activities were set in the very distant future, the content was highly spiritual/metaphysical, all while being very collective both in terms of behavior and creativity. Why Enactavision evoked such different kinds of expression in comparison to the other participatory methods in this study is unknown. Both the full-body immersion within a space and using a virtual environment are unique characteristics of Enactavision relative to the other design research methods that were investigated. So a conclusion cannot be made as to which characteristic (i.e., virtuality or full-bodied motion) was most influential on the unique type of expression.

The use of physical tools has been explored, but research about virtual tools and environments are wide open. Another possibility to consider for continuing this research could explore people making their own virtual objects and then enacting with and telling about the virtual objects. Further research about the interesting cross-space between tangible and virtual objects could be further explored by virtually mapping images onto tangible objects or within physical space. Another study could investigate what method, or lead activity: making, telling or enactment, might be most appropriate according to the type of problem or to meet the needs or goals of a project. This kind of study would be able to provide guidelines for other researchers and begin to share why and when to use methods both hypothetically and in practice.

The next steps for this research might also involve the exploration of how to use the results and insights from all forms of generative design research method activities responsibly. By envisioning the future emotionally, honestly, and expressively we can begin to weigh the pros and cons of so many advances in technology, science and spirituality that are on the verge of being reality. By speculating about the future before we actually “get there” we can first be confident that the benefits outweigh the risks.

**References**


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A 2013 Master of Fine Arts graduate in Industrial, Interior and Visual Communication Design from The Ohio State University, Columbus, Ohio, USA. Passionate about inviting people into the earliest stages of the design process, she researches to discover what could be possible in the overlapping fields of embodied interaction, collective creativity and human computer interaction. Emily is fascinated by children at play and explores new methods for participatory design research.