

# Interaction and Collaboration Modes for Integrating Inspiring Information into Technology-Enhanced Creativity Workshops

Angela Carell  
Information and Technology Management  
Ruhr-University of Bochum  
Germany  
+43 234 32 27724  
angela.carell@rub.de

Thomas Herrmann  
Information and Technology Management  
Ruhr-University of Bochum  
Germany  
+43 234 32 27720  
thomas.herrmann@rub.de

## Abstract

*The design of a creativity workshop which helps to develop new ideas of how to support elderly people to live in their own home for as long as possible is presented. The participants of the workshops were inspired by special stimuli based on everyday experiences with the needs and problems of elderly people. The facilitation of the workshop had to introduce this inspiring information and to combine it with appropriate brainstorming questions, material to work with and technical support. For the display of and interaction with information units a 4.8 m x 1.2m interactive screen was employed. Various modes of work and collaboration were combined. The case study is concluded with lessons learned about how interaction and collaboration modes for integrating inspiring information can appropriately enhance creativity workshops.*

## Keywords

Collaborative Creativity, technology, co-located meeting

## 1. Introduction

Creativity in groups has to tackle the following dilemma: on one hand, creativity needs the opportunity of a retreat where people can focus on the challenge they want to meet, intensively communicate without being distracted by business-driven interruption, and can experience a flow. On the other hand, everyday life and its problems to be overcome represent a source of inspirational data which helps to generate new ideas, and a source of cases which can be used to challenge the appropriateness of new ideas.

To overcome this dilemma we have developed a workshop concept which allows the participants to exclusively focus on a problem but also introduces aspects of everyday experiences as inspirational information which is partially electronically mediated. This workshop concept is specifically conceived to support a phase of ideation where it is important to develop as many good ideas as possible. In our case, the service4home-project, ideas are needed about how elderly people can be supported to live independent lives for as long as possible in their own homes. All kinds of support had to be taken into account such as commercial services, help from neighbors or care from relatives. This

type of workshop has to be a fundament for a series of brainstorming rounds which are carried out by the participants but triggered by material and activities which represent the relevant parts of the everyday life outside the workshop – in our case the everyday life of elderly people and those people who try to take care of them.

Ideas were collected at a workshop with participants who represent various perspectives. We expect the numbers of creative ideas to probably increase if they are developed by different stakeholders who have differing backgrounds and expertise. This complies with [4] observation that “an idea or product that deserves the label ‘creative’ arises from the synergy of many sources and not only from the mind of a single person”(23). We call this phenomenon “collaborative creativity” [16]. We consider collaboration as a process where people usually know each other and work together and at least have the possibility to give feedback to each other’s ideas and work. [8] outline that collaborative creativity (in their words “social creativity”<sup>1</sup>) draws advantage from including different people with different backgrounds (spatial, temporal, cultural etc.) and that conceptual collisions can enrich the collaboration.

In the context of our case, achieving creativity is just the opposite of the repetition of routinized, anticipatable activities or of a well-structured, effectively manageable project – collaborative creativity means dealing with a wicked problem [18].

Having a group of different people who don’t know each other very well introduces a number of creativity barriers as described in ideation literature. Working in groups may prove less effective for various reasons [7] [19]: Production blocking may occur because people wait for a turn to speak. While waiting they may forget some ideas before they can report them; they may not generate new ideas while listening to others, or while trying not to forget their own thoughts. Free-riding occurs when people stop trying to generate their own ideas, but rely on others who are able to make contributions. A further problem is the fear of being evaluated by others (evaluation apprehension).

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<sup>1</sup> We prefer this term to “social creativity” (Fischer 2004) since every kind of individual thinking is of social nature.

To overcome these limitations it is reasonable to employ technical support as it emerged in the context of GDSS (group decision support systems; [6]), and EBS (electronic brainstorming systems) or electronic meeting support [17]. We focus on a support for face-to-face meetings by using a large screen (4.8 m x 1.2 m) which is seamlessly interactive. Together with a set of software-tools, this installation can be used to support brainstorming and synergy-building between ideas. The process modeling tool SeeMe-Editor [11] which was developed in our own center plays an important role in the workshop. This tool facilitates the display of small information units which can be flexibly moved around. The advantage of this software is that these units can be combined with other super-elements (which serve as clusters) very easily by a drag and drop-mechanism. The embedding mechanism is also combined with a hide and show mechanism which allows the users to flexibly reduce the amount of information units which are displayed in the course of a discussion. The editor for the use of the large screen was enhanced with the possibility to use gestures to activate the hide and show functionality, and to adapt the size of the information cards etc. The design of a creativity workshop is not only a matter of technology but also a task of facilitation. [2] describe the role and tasks of facilitators in the context of the “thinklets” approach for ideation. One important task of the facilitator is to provide – or at least to convey – external stimuli to influence the interaction or thought patterns of the participants in an ideation workshop [19]. “These stimuli are an effective way to prevent recurrent thought patterns that lead participants to become “stuck in a rut” while engaged in ideational activities. [19].

In the following section, we present the background and methodological approach (section 2) of the workshop concept. It is mainly focused on including everyday experience as a means of enhancing creativity and to combine it with scientific knowledge. Section 3 outlines the workshop by starting with the description of its goals, the participants and its procedural structure. This structure is described with the following dimensions which characterize such a workshop concept:

1. Phases and modes of collaboration (presentations to the whole group or to small sub-groups, discussion in the whole group, work in sub-groups, interaction between sub-groups, ...)
2. Spatial and technical setting
3. Kind of material and information which is used as inspirational source
4. Kind of interaction with material or technical systems.

The section of workshop description is followed by a section on the type of data analysis (sec. 4) which leads to the lessons learnt (sec. 5) and finally to a summary which includes recommendations for practitioners (sec. 6).

## 2. Background and methodological approach

The literature on brainstorming and ideation takes a lot of aspects into account of how groups’ capacity to generate new ideas can be enhanced. All these techniques focus on the obstacle that people stay within the boundaries of a certain type of idea which was voiced at the beginning of a brainstorming session (cognitive inertia, cf. [3]. The theoretical background is that many problems are caused by the limitations of human memory. [20] suggest that the limited working memory makes it difficult to have different aspects of the problem space simultaneously in mind and therefore to be able to build manifold and unusual combinations. To handle this limitation, people build semantical chunks which make it sufficient to find information in their long-term memory but again guide their thinking and may limit their flexibility. New ideas are either not found along this chain of semantical chunks or they are easily lost because it is hard to bring them into line with the existing concepts.

To overcome these basic obstacles, [19] proposes the provision of a series of stimuli which are conveyed by a facilitator to help the participants overcome their cognitive barriers. “These stimuli are an effective way to prevent recurrent thought patterns that lead participants to become ‘stuck in a rut’ while engaged in ideational activities.” [19] While ideation theory is concerned with the number and quality of generated ideas, another problem is the integration of the number of contributions of several participants in a workshop. In this context of knowledge integration, there are barriers which became apparent with so-called hidden profile experiments [21]: If someone does not know the knowledge profile of another and therefore does not actively ask them for the needed information, one is not open-minded towards integrating unexpected information. The experiments reveal that items of information delivered by others receive more attention the more the recipient is already familiar with them – new information is usually neglected in the decision process. [22] give an overview over the hidden profile experiments and the possible explanations of the results. With respect to the facilitation of a workshop and its technical support it becomes clear that the permanent visualization of information and ideas – which are new for others – is helpful for bridging the time span which is needed to become familiar with new ideas.

The design of the workshop was not only theoretically informed but also based on practical experience with several workshops with tasks such as *vision of a project on ambient assistant living* or *how to build synergies between ideas* [12].

The workshop concept was oriented by the strategy to use facilitation and technical support to overcome the obstacles of which we became aware through theoretical and practical insights. We therefore pursued a socio-technical

concept which is guided by a set of six heuristics developed by [11]. Most important for the workshop design were:

- Supporting the larger picture – visualization of rich material
- Malleability of shared material and stimulation of variations
- Support of role dynamics and varying mode of collaboration

These heuristics are enriched by the work of [10], who describe requirements such as keeping multiple design ideas visible simultaneously and that shared ideas should always remain in the collective consciousness. The Bounded Ideation Theory approach of [2] also represents important requirements which have to be taken into account: They emphasize sense-making to overcome the understanding boundary and the relevance of interventions which help to make a task more open-ended and help to increase the diversity of stimuli.

Our Approach is different compared to the psychological research in the field of ideation and knowledge integration with respect to the following aspects:

- We do not run experiments but the workshop had to contribute to the development of a socio-technical solution to handle services for elderly people. Therefore the systematic facilitation, the integration of inspirational as well as technical information can be considered as scientifically informed interventions in the course of a practical project. The effects of the interventions are analyzed under the conditions of an action research approach [1].
- The inspirational information is not focused on influencing cognitive processes but on providing a context which helps to identify all relevant ideas for services which support elderly people. From the viewpoint of the partners in S4H-project it is not only important to find new ideas but also to cover the whole spectrum of the existing support of elderly people. Therefore, one participant's feedback was that more information about the state-of-the art of existing solutions should have been distributed before the workshop. With respect to such a requirement we had to find a subtle balance between including sufficient context about existing knowledge and leaving enough space for the development of new ideas by avoiding the cognitive inertia problem.
- The workshop was part of a series of events in a socio-technical design process. Therefore our methods of interventions are subject to continuous improvement. The scientific research has always two goals: not only to learn how to improve services for elderly people but also how to improve the methods for finding new ideas in this context.
- The sources of our inspirational data were not mainly selected with respect to criteria of cognitive stimulation. The appropriate interventions and stimuli were not exclusively selected to overcome the limitation of established chains of semantical chunks. By contrast, the closeness to real life and everyday experience was the decisive criteria for choosing the stimuli for our workshop. The goal

was to investigate how far we could overcome the deficit that the idea finding process was not located in the midst of the problems which are experienced by elderly people every day. This approach requires a preparation phase before the ideation starts: the challenge which has to be met and the underlying facts and data have to be intensively analyzed. These activities of preparing the ideation are described as “messfinding” and “data-collection” by the Osborne/Parnes scheme [5] [15]. The design company IDEO named this phase in the ideation process “observe” [13].

### 3. Case study and concept of the workshop

#### 3.1 Goals and context of the workshop

Our case study focuses on a workshop which was planned to support an ideation for collecting ideas. These ideas had to comprise all kinds of services and support which might be relevant to the capability of elderly people to live in their own home for as long as possible. The requirement was that the idea pool represents a complete spectrum of supportive activities which can be managed and coordinated by a service agency.

This goal of the workshop is related to the overall goal of a three year long interdisciplinary project that aims to establish a service agency and its IT-infrastructure. One specific element of this infrastructure is the usage of micro systems-technology: using a digital pen looks and feels like using its normal ballpoint counterpart. However, it contains an integrated digital camera, an advanced image microprocessor and a mobile communications device for wireless connection. The digital pen user transfers data wirelessly after it has been temporarily stored in the pen by ticking a box on the paper, interpreted by the pen as a “send” command. The pen will then use Bluetooth to instantly send data via a mobile phone.

On one hand this pen-technology seems to represent a solution which has a low level complexity threshold for elderly people to use electronic data transfer in their everyday life without employing a computer. On the other hand getting elderly people started in the use of such technology requires the selection of an appropriate combination of services where the entering of data is not very complex and the achieved benefit becomes directly apparent. Furthermore it is important that the usage of the new technology does not suggest that it will replace real communication with other people.

To support a successful selection of an appropriate set of services for getting started it is important to have a wide range of possibilities upon which this selection can draw. Therefore, we had to run a workshop which enabled the participants to contribute at a high level of creativity.

The creative task was mainly

- not only to refer to well known types of services for elderly people but to identify or to draft new types of possibilities to support elderly people,
- to conceive new ways of how commercial services can be combined with types of support as they are provided by neighbors or relatives.

The described workshop is only the starting point of a workshop series. Further tasks are to develop

- a concept of how the technology of the camera enhanced pen could be employed successfully,
- a process model which describes how the service agency will coordinate the interplay between several services.

For these two tasks it is not possible to build on existing role models. Therefore, creativity is needed which has to be promoted in succeeding successive workshops. The workshop developed and evaluated first serves as a pattern of how to proceed in the following workshops.

All in all, the first workshops have three goals:

- the participants should be inspired to transcend the status quo of existing services for elderly people,
- to convey an illustrative picture of how the everyday life of elderly people appears / is and to understand the fears and preferences of elderly people. This includes the insight that elderly people may need to be supported but do not wish to admit this clearly,
- to learn about the services which are already on offer and how they are used by the elderly people and under which conditions

### 3.2 Participants

There were 12 individuals who participated in the workshop. Their heterogeneity comprises aspects such as gender (6 male, 6 female), age (range: 27-55 years), status (students, postdocs, associated professors, full professors, practitioners) and from a professional background (see below). The participants contributed their experience from several perspectives: five of them had an academic background and were involved in research on the needs of elderly people. Two other participants actively work with elderly people and are used to provide services to them – they are a kind of “case manager” or consultant for elderly people and help them to combine the types of support which are most appropriate for them with respect to their needs and financial resources. These two people had an important role in the workshop because they were representatives able to describe their everyday experiences with elderly people in a very concrete way. The workshop concept provided opportunities to motivate them and to give them time to convey their experience. On top of this, the integration of two elderly people into the workshop was planned. Due to personal reasons, both eventually declined to participate and couldn’t be replaced within the remaining time.

Four participants were experts in the area of process management and IT-support for services – they had no particular professional experience with services for elderly people before the workshop started. Another represented the company which provides the technology for the pen with the integrated camera, and he had the role of contributing his experience with the usage of these pens in other

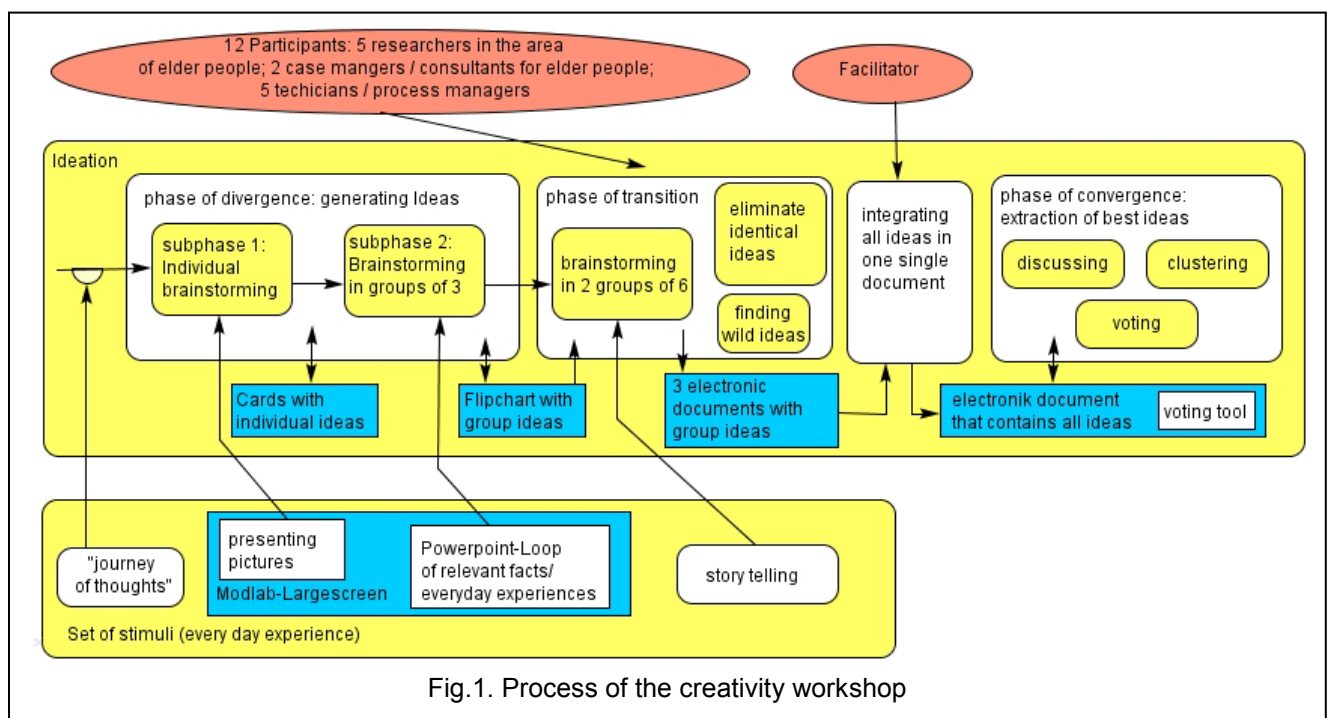


Fig.1. Process of the creativity workshop

application contexts. Nearly every participant had some idea of the needs of elderly people. This exchange of experience was therefore important so that everyone could challenge her/his own beliefs in the light of the reports of others.

The workshop was facilitated by a 13<sup>th</sup> person; two of the academics were involved in the preparation of the workshop. Furthermore, a student helped to keep record of the contributions of the participants.

### 3.3 Structure and process of the workshop

The workshop was planned to last approx. 3.5 hours. The collaborative work was subdivided into three phases: divergence, transition and convergence (see above, fig. 1). The technical facilities of the Modlab-room helped to build a constellation of technology enhanced creativity, electronic media and paper cards were combined. The brainstorming stimuli were based on the everyday experiences which had been gathered from ethnographical research.

**3.3.1. Phases and Modes of Collaboration.** All kinds of different models of creative procedures usually comprise an alternation between two types of phase: those where a large number of divergent ideas are developed and others where the number of ideas is reduced by merging and clustering them, by eliminating redundant contributions or by selecting prioritized ideas. Consequently, the workshop was roughly divided into a phase of divergence and a phase of convergence. In between them was a phase of transition (see fig. 1) which helped to merge ideas but also included impulses which stimulated further ideas. The divergence and transition phases lasted 45 minutes respectively while the phase of convergence lasted 70 minutes.

*Phase of divergence.* The phase of divergence was subdivided into two steps which differed with respect to the mode of collaboration: “individual brainstorming” and “Brainstorming in groups of three”. Within the first mode, the individual perspective of every single participant was in the foreground. Every participant noted down his own ideas without being influenced by others. To allow the participants such a phase of individual work was important to avoid typical creativity barriers as mentioned above [7]: production blocking, cognitive inertia, free riding and evaluation apprehension.

In the second step, the participants had to find ideas which were stimulated by a new question. The answers to this question could be based on the ideas which had been initially collected, and could also complement them. It was intended that the collaboration and discussion between three participants provide a mutual stimulation and prepare the intensive

exchange of ideas. This is important to avoid insufficient knowledge integration as it may occur if ideas are exchanged in large groups or cannot be intensively reflected and discussed [21].

It was the facilitator’s task to present the stimuli for the ideation. During individual brainstorming the question was: “How does participating within a network of individuals who are professionals, neighbors or relatives support elderly people?” For the brainstorming and discussion in the small groups the question was: “Which kinds of concrete services for elderly people can be derived from the ideas which were found in the first round?”

*Phase of transition.* In the phase of transition the four groups of three were melted into two groups of six to promote further knowledge integration. They had to go on answering the second question (“Which kinds of concrete services...”) and were asked to integrate their ideas by merging them and by eliminating redundancies. In this phase, the ideas of both groups were electronically stored (see Fig. 8). Both groups were also encouraged to note down new ideas which came into their minds while working with the ideas of others. Therefore, the second question was – after a while – completed with a new stimulus. The participants were required to think about a well known VIP of the local region who is active in the soccer business and to imagine that this person would like to spend his life as an elderly person in a luxury service-providing hotel. The question was which services the management would offer such a guest. This stimuli were very important and led to a whole set of new proposals.

*Phase of convergence.* When it came to the phase of convergence, the two subgroups of six came together and were asked to make themselves familiar with their results. This was not triggered by asking them to give a report on the work in their groups. By contrast, all ideas from both groups were merged and integrated into a single document (by a student during a break) and were then displayed on

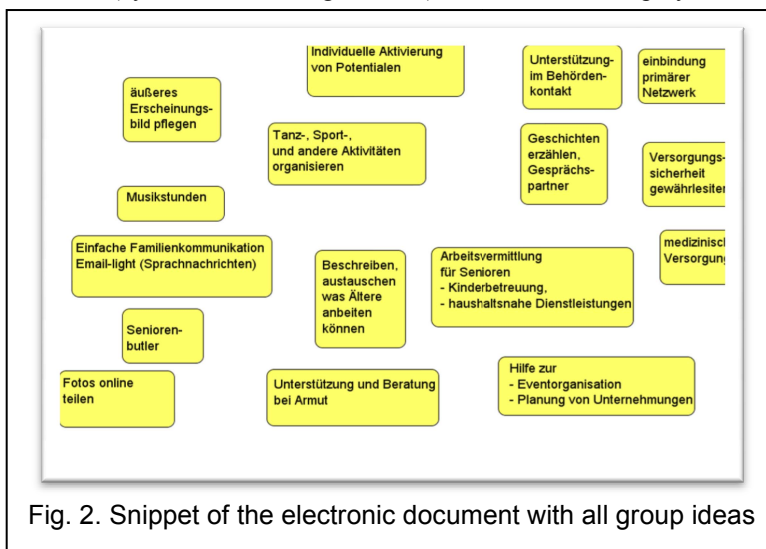


Fig. 2. Snippet of the electronic document with all group ideas

the interactive large screen (see fig. 2). The document was presented with the SeeMe-editor (see sec. 1)

The merged document was used to start the phase of convergence with a kind of a memory-game (see fig. 3): the two groups of six people were asked to have a look on the ideas which had been contributed by the other group, to identify those ideas which were new for them and to move them by dragging and dropping them into a box of new ideas (see fig. 4). The purpose of the game was to motivate the participants to have a closer look at the information units, reflect their content, and become more familiar with what the others had contributed. After the awareness for others contributions had been increased, the discussion started and was triggered by a guiding question: “Which of the proposed offers for supporting elderly people can be efficiently coordinated by the service agency to avoid the wasting of resources?”

**3.3.2. Spatial and technical setting.** The workshop was run in a facilitation collaboratory (ModLab) at the University of Bochum, Germany. The centerpiece for meeting

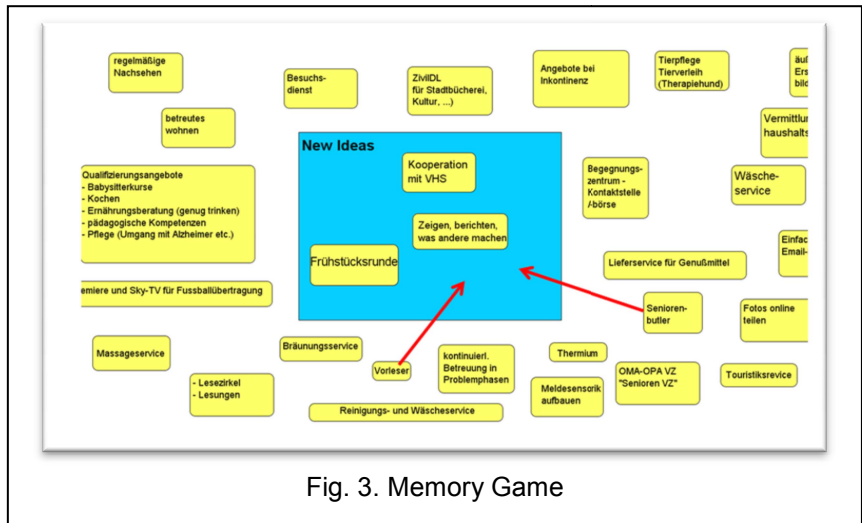


Fig. 3. Memory Game

present the contributions of the participants, and the SMARTTM-software which is used to control the interaction with the board but also provides means for making notes, handwriting recognition, annotations on Powerpoints etc.

Furthermore, we identified some web applications (Google Docs, Mindmeister, bubbl.us) which support the collaboration within and between meetings. Furthermore the Modlab is equipped with two tablet workstations and several laptops which can be used to enter data and to prepare presentations which can be exchanged with the interactive large screen via WLAN.

It was reasonable to run the workshop in this Modlab and to combine the traditional type of brainstorming with

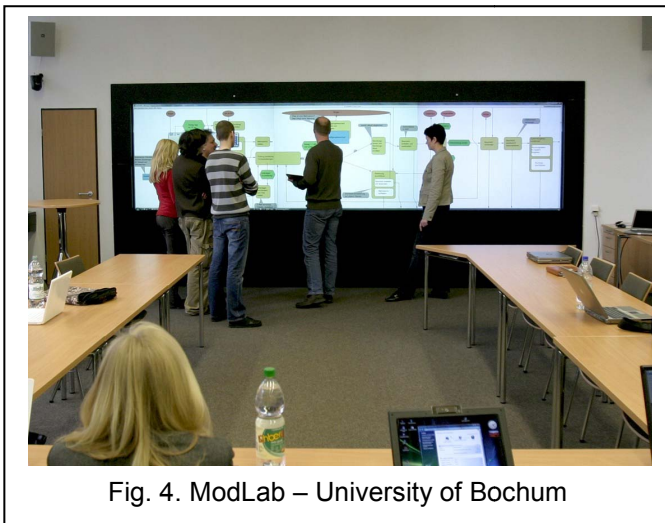


Fig. 4. ModLab – University of Bochum

support in Bochum is a large, high-resolution interactive wall (4.80m x 1.20m; 4320x1050 pixels) which seamlessly integrates three rear projection boards (see fig. 4). Touches are recognized via six cameras which view the reflection of infrared light that is caused by fingers or pens. The angles of view of the cameras overlap to support uninterrupted dragging actions over the entire wall. Data can be entered and manipulated directly on the screen or via laptops which are connected via WLAN. At the moment, certain types of software are available, mainly the Microsoft™ office suite, the SeeMe-editor for process design, which was used to

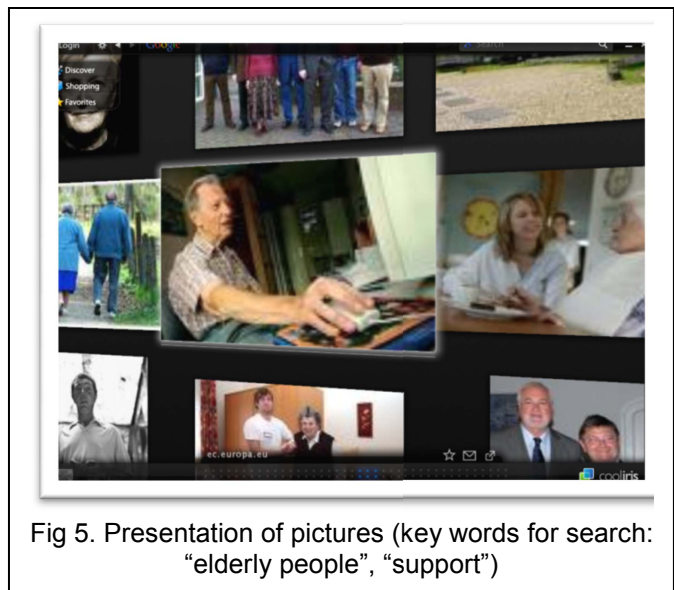


Fig 5. Presentation of pictures (key words for search: “elderly people”, “support”)

pens and cards with the possibilities of the interactive large screen. The smooth transition between old and new media was pursued because most of the participants were not used

to this type of technology and we wanted to give them the opportunity to gradually adopt the new possibilities.

The room is large enough to be split into several areas so that interaction in the whole group as well as the work in small groups could be conducted in the Modlab. The area which was closer to the large screen was used for the mutual discussion where the participants were sitting in a semi-circle. The other part of the room was used for smaller work areas where pinboards were employed and workstations were available.

### 3.3.3. Kind of material and information which is used as inspirational source/stimuli.

The ideation was supported by various ways of introducing everyday experiences with elderly people. The combination of different phases, questions and modes of collaboration offered the opportunity to introduce this experience step-by-step in various forms. The intensity and concreteness of the presented experience was gradually increased. It started with the usage of the tool “piclens” to show images of elderly people in various situations (see fig. 5, above). This method is in accordance with strategies for directed brainstorming where keywords are randomly chosen from a dictionary to provide certain stimuli. Instead of keywords we offered pictures which were selected by an assistant who was not actively involved as a workshop participant. He used google picture search and decided to enlarge those pictures for a while in which he was interested. Afterwards he switched to the next pictures.

For the work in the groups comprising three individuals each, several aspects, facts and examples of elderly peoples’ everyday life were introduced and presented in a PowerPoint loop. The loop was displayed on the large screen and was visible from all points in the room. The ten slides were continuously repeated and could be observed more or less en passant during the discussion of the groups – the participants decided by themselves whether and when they used this stimulus (see fig. 6). The data for the loop was gathered in the ethnographical and analytical work carried out before the workshop. The following topics were covered by the loop:

- Interest in services which are related to the home
- Ranking of services in which elderly people were most interested
- Degree of willingness to pay for the services
- Interests with respect to entertainment and leisure time
- Mixture between professional and informal services

The information was presented as headlines, graphical diagrams or as mindmaps.

In the phase of transition, a person provided story telling. The stories were also derived from the ethnographical research. The groups were free to decide to ask the story

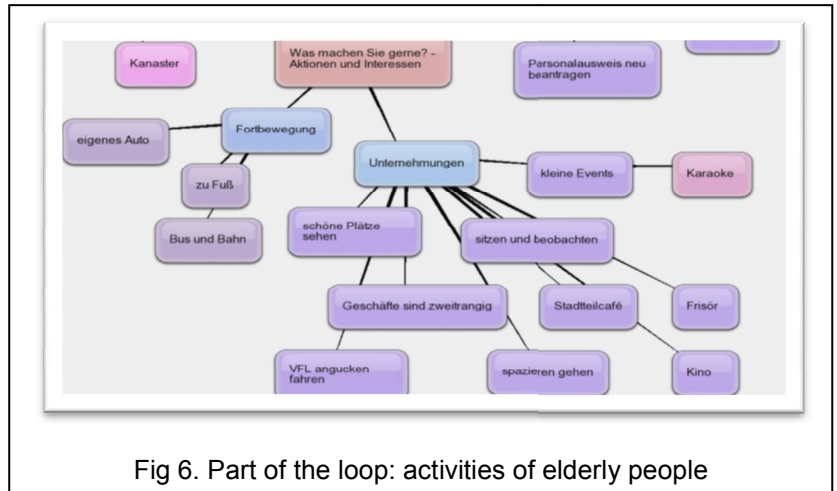


Fig 6. Part of the loop: activities of elderly people

teller to tell them a story. The story teller had a repertoire of three stories:

1. Some elderly people used the help of their relatives in exchange for small presents, e.g. grandchildren received a pocket money.
2. Some elderly people invested a lot of effort and inconvenience to help other elderly people or people who were even younger.
3. Some elderly people were not happy with just having their hobbies but wanted to do something “useful” such as cleaning, cooking etc.

During the discussion in the phase of convergence these stories were completed by reports which were provided by the two professional service providers participating in the workshop. Although stories can lead to the problem of

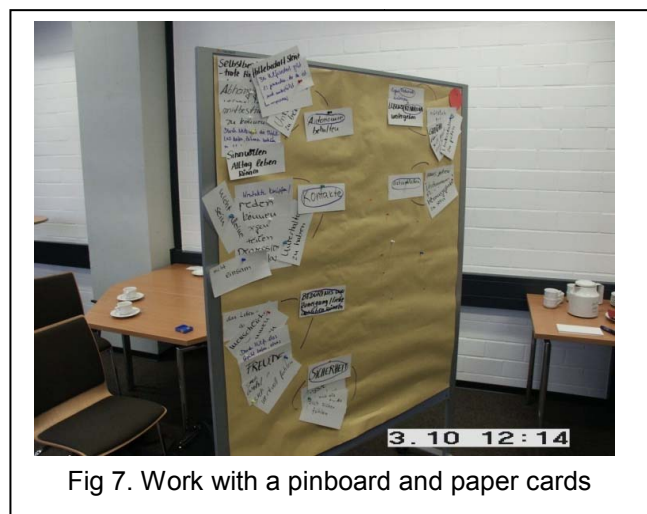


Fig 7. Work with a pinboard and paper cards

production blocking because they need more attention than the en-passant-watching of pictures, it became obvious that they were valuable stimuli.

**3.3.4 Kind of interaction with information, material and technical systems.** All in all there were various ways in which people interacted with information and material: they used traditional material such as pen and paper; they listened to stories, they watched the alternating pictures and the Powerpoint loop, and they used the electronic media to document their ideas and to cluster them.

The type of interaction depended on the applied collaboration mode. The individual work on collecting ideas was most appropriately supported by pen and paper because not every participant had experience in using the technology. The paper cards were then assembled on a pin board once the work in small groups had started (see fig. 7). Later on in the smaller groups with 6 individuals there was usually at least one participant who had experience in entering the data and preparing an electronic presentation (see fig. 8).

Switching to an electronic medium was useful for the following phase of convergence. The transition to the electronic medium had the advantage that every idea was perceived a second time and could be discussed (see fig. 8). Furthermore, the electronic presentations facilitated the process of rearranging and the clustering of the information units. Finally, the electronic document provided a much better basis for the continuing work after the workshop than paper passed documents or pictures of them.

#### 4. Documentation and Analysis

The analysis of this paper is based on five types of data:

- The material which was prepared to support the workshops (e.g. the electronic presentations, detailed agenda, process model of the workshop) and which mirrors the information and inspiration stimuli which were offered to the participants as well as the organizational procedure of the workshop which was outlined in detail as guidance for the facilitator,
- The paper-based (mostly brainstorming cards) as well as electronic documents which were produced during the workshop,
- 3.5 hours audio- and video-recording of the workshop from three viewing angles. While this video material helps to achieve an overview on what happened during the workshop, digital photos were also taken to show the details of certain situations.
- The oral feedback from the participants given during a group-discussion at the end of the workshop. This discussion was triggered by the question "What could be improved in the running of this kind of creativity workshop next time?" In more detail, the statements of the participants were related to the following aspects: Modes of collaboration, the electronically as well as non-electronically presented information's usefulness for idea finding, technology enhanced workshop set-

ting and their kind of interaction with the presented material.

- The observations and notes which were taken by the researchers during the workshop and immediately at its end when the course of the workshop and its result were discussed.

The exploratory evaluation of the material was conducted in two steps: firstly the material was roughly scanned through. On this basis a detailed description of the real procedure of the workshop was outlined and working hypotheses as well as questions were derived which could guide a deeper analyses. In particular, the various collaboration modes and ways of introducing stimuli from everyday experience were related to their effects on the ideation process. Therefore, the 2-step-analysis was guided by two central questions:

- Could the applied inspirational stimuli help idea production to be continued or resumed after the flow of ideas had been interrupted (quantitative aspect)?
- Did a certain inspirational source lead to new ideas not mentioned before in literature or by research projects focused on services for elderly people (qualitative aspect)?



Fig 8. Transferring the data from cards to the computer

#### 5. Lessons Learned

Based on a first exploratory analysis it became apparent that the stimuli which refer to everyday experience were perceived by the participants but used in different ways and had different effects with respect to creativity. In the phase of individual brainstorming, the pictures were only taken into account en passant as expected. According to the results of the group discussion the participants were not able to clearly indicate whether the pictures had inspired them to



find new ideas or not. If such an effect had been the case it was not consciously perceived. The Powerpoint loop which was presented on the interactive large screen during the phase of divergence (work in small groups of 3) did not attract sufficient attention. Referring to the results of the group discussion and the analyzed video material, we assume that the presentation was at too far a distance away from the groups: The presentation only had a direct effect on those people who were standing close to the wall. These participants felt directly involved into what was going on. The minor influence of the loop was also caused by the way in which the small groups were positioned in the room. Furthermore, the discussion in the groups was so intensive that they had no leisure time to search around for further information. We suggest that such a presentation of everyday experience is only clearly effective if the participants have so much time that they come to the limits of their own imagination and start looking for further inspiration. The workshop is definitely based on the suggestion that the introduced stimuli and media must not draw the main attention of the participants. In contrast to television or advertising, the stimuli are an additional source which should only come to the attention of people if their minds become idle and if they start actively seeking. Therefore a subtle balance between drawing attention and “being easily ignored” has to be found. In the concrete case we did too little to increase awareness of the loop. It could be recommendable to ask people to have a break, to walk around, to have a closer look at the loop and to discuss it with others, and then continue with their brainstorming work.

The story-telling, which took place in the phase of transition, was more effective – at least from the viewpoints of the participants. It helped them to find new ideas. For example, the second story lead to the insight that elderly people also need help to be able to help others – this is an aspect which is not usually found in the range of commercially available services. The story telling seems to represent the strongest stimuli. However, it is also a stimulus which requires most of the awareness and cannot be perceived en passant.

Merging the ideas of two groups was reasonable because it led to a reconsideration of the collected ideas. This was emphasized through the necessity for every brainstorming card to have to be entered into the computer system. While such a switch between media is considered unsolicited in the context of office work, it has positive effects with respect to the synergizing of ideas. The time need for typing caused a break which gave five people the opportunity to think about an idea while the sixth was typing it. The need to rewrite every contribution caused a systematic walkthrough through all the contributions.

The interactive large screen had various functions. On one hand it was used to display information about the organizational procedure of the workshop. Furthermore, every brainstorming question was represented on the

screen. During the phase of divergence, the whole screen was used to present the loop so that it could be seen from all points of the room. During the phase of convergence, the large screen was used as medium with which the information units could be easily manipulated by pointing and dragging with a finger. This kind of manipulation allowed the participants to deal actively with the contributions of others and therefore to become familiar with their ideas. Referring to the results of the group discussion, the memory game was most useful to support the effect of being aware of the contribution of others. The large screen was helpful to receive an overview and to indicate those ideas which were new and were expected by everyone (e.g. a rent-a-pet service).

On the other hand, the interactive large screen was quite unusual for some of the participants and it was difficult for them to use it spontaneously. The video analysis showed that some of them remained sitting on their chairs and did not dare to touch it. This phenomenon was familiar to us since we knew that newcomers to the Modlab need time to get used to the new way of interacting with computers especially if they are being observed by others. Because of this reluctance we suggest either providing the participants with laptops – which can be used without being observed – or with paper cards and pens because the usage of this material is more familiar to them. Furthermore, there was a kind of “labor division” between the technically oriented people and the story tellers: it could be observed that some participants’ work with the information units at the large screen was accompanied and completed by stories which were told on the basis of the everyday experience of the other participants.

## 6. Summary

The design of a creativity workshop was presented which helps to develop new ideas about how to support elderly people to live independently for as long as possible. The participants of the workshops were provided with special stimuli based on everyday experiences with the needs and problems of elderly people. The facilitation of the workshop had to introduce these stimuli and to combine them with appropriate brainstorming questions, material to work with and technical support which offers the display of and interaction with information units on a interactive large screen. Various modes of work and collaboration were combined.

The approach which is presented with the case study of this paper goes beyond the current ideation research:

- We focus on descriptions of everyday experience as stimuli,
- various modes of technology-enhanced collaboration between the participants are mixed

- the perspectives of the participants are highly heterogeneous and influenced by their own interests

Furthermore we have organized a smooth transition from traditional brainstorming material (pens, cards and pinboards) to electronic means for presentation. The usage of an interactive large screen made it possible for the same amount of content which was collected with the pinboards to also be displayed with the electronic medium.

The lessons learned section will help us to derive hypotheses which can be subjects for further, more controlled experimental investigations in the Modlab. We make some recommendations for the organization of workshops which pursue similar goals. However, the effect of these recommendations should be carefully observed because of the exploratory status of our investigation:

- It is reasonable to use different media and to mix paper-based and electronic material
- even the necessity to rewrite ideas to enter them into the system can increase the awareness for every single contribution and provides the opportunity to see them from a new perspective
- there should be a phase of transition which bridges the step from divergence to convergence. This transition can include a switch between the applied media (e.g. from paper and pen to electronic representation)
- story telling is a very influential and flexible means to help people see things from the perspective of real life.
- People should have the opportunity to move around and combine information units by themselves.

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