

Wikideas and Creativity Connector: Supporting Group Ideational Creativity

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ABSTRACT

In Ideation2.0 project [1] we are researching, developing and testing Web2.0 technologies to support group ideational creativity. We use wiki technologies in *Wikideas* tool to allow brainstorming sessions that gather large number of ideas which can be visualized later by other group members, thus enabling the generation of new ideas. *Creativity Connector* is a tool that is integrated with *Wikideas* and whose mission is to connect anonymous users into brainstorming groups to produce a greater number of innovative and original ideas. We consider that with their utilization will bring about a significant improvement in group ideational creativity. The assessment of these tools has been carried out in a study with 50 university students.

Categories and Subject Descriptors

K.4.3 [Computers and Society]: Organizational Impacts – Computer-supported collaborative work.

General Terms

Design, Experimentation, Human Factors, Management.

Keywords

Creativity, Social Networks, Wikis.

1. INTRODUCTION

Creativity is a human capacity of multidimensional nature to generate ideas for solving problems and to create original products assessed as useful for the community. Creativity involves solitary efforts but also, at some stage of the creative process, the combination of contributions from others. While the creative subject is important, so is the fact that it is part of an innovative group if we want to get many alternative solutions, choose one of them and develop it wisely. Group creativity is defined as the shared exercises of divergent thinking skills. Multiple factors are involved in the process of group ideational creativity, some facilitate and others inhibit [4]. In this communication we describe two tools to support group ideational creativity based on recent Web2.0 technologies and evaluate their use.

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Since the 90's computer tools have been researched to maintain and promote the beneficial factors and counteract the negative. On the one hand, computer based graphic interfaces favor the display and manipulation of large amounts of information allowing the structuring and management of ideas facilitating the generation of ideas. Moreover, the possibility of networking allows several computers to create group support tools that contributing significantly to the improvement of communication and generation of ideas among its members by enabling participants to write their thoughts and value their anonymous companions' ideas. An example of these systems is Electronic brainstorming groups, EBS [3]. EBS groups can produce more ideas than verbal brainstorming groups and nominal groups working at the same time but without exchanging ideas [4]. EBS has many advantages when compared with the use of the technique of verbal brainstorming: a) avoids production blocking of face to face groups when participants have to wait their turn to participate or do not want to express an idea because along the discussion seems no longer relevant, b) reduces the apprehension to be evaluated negatively by others; in this regard anonymity allowed by EBS is a big advantage, c) there is no need to respond to the ideas of others at the time that the broadcast and, finally, d) supports simultaneous communication. The Internet has enabled the creation of online brainstorming tools that allows distributed work groups without coincidence in time. The advantages of online tools are: a) remove temporal and spatial barriers, b) allow groups of potentially unlimited size, although it is found that, in contrast to collocated situations, it is necessary to establish some guidelines for this process to succeed.

Recently the National Science Foundation organized a workshop to discuss research issues of creativity support tools [6]. The outcomes of the workshop were that long-term case studies are needed for evaluation and a series of recommendations for the rapid development and testing of tools, which we intend to follow in our project.

2. IDEATION2.0 PROJECT

Ideation2.0 project [1] is investigating Web2.0 technologies to support group ideational creativity. Wiki servers permit the creation of online workspaces to store unstructured information in a relational manner over long periods. Social networking technologies define new forms of communication and organization which could be harnessed to generate creativity and idea generation communities and networks. Accordingly, we too are using these technologies in the design and validation of tools for improving ideational group creativity: *Wikideas* and *Creativity Connector*.

2.1 Wikideas

Wikideas is a wiki-based tool built extending Wikka-Wakka software. It permits users to edit web pages online repeatedly storing all versions for later viewing. *Wikideas* permits holding brainstorming sessions on line by several groups who can enter their ideas simultaneously. Once stored in the system, ideas can be viewed by any member of the group in Web pages organized in different ways encouraging continuous generation of new ideas.

Wikideas is not as interactive as other brainstorming software tools [5], however it has a number of advantages: it is very simple to use for editing, modifying and linking, admits organizing ideas in different ways, keeps historicals of ideas and user accesses, and can be easily integrated to other tools with RSS feeds, REST interfaces or widgets. We argue that *Wikideas* can ease generation of ideas in different group settings.

Related projects currently underway in the University of Colorado [2] aim their efforts to extend Wiki technology to enable the production of ideas in other formats: drawings, pictures, etc.

2.2 Creativity Connector

The second tool, called *Creativity Connector*, is a social networking tool that aims to connect participants in brainstorming sessions with the following objectives: 1) to create heterogeneous groups that are composed of individuals differentiated by their skills, knowledge and experience, given that diversity promotes creative potential, spontaneous production of alternative solutions to a problem and interaction and combination of different perspectives, and 2) to connect unknown participants to meet and form teams to work together to develop previously generated ideas, even generate new ideas.

Creativity Connector works with *Wikideas* and uses information produced by its users to connect and bring together participants. Users are automatically assigned to heterogeneous groups when they enter *Wikideas*, and connections between participants are made through recommendations or allowing users to observe the activity of other users to decide whom to initiate direct communication. Most computer tools to support the generation of ideas implement an anonymous input mode to avoid blocking motivated by the apprehension to the evaluation. But sometimes it is desirable that the ideas of the participants are not anonymous, for example to prevent the free riding. To achieve these *Creativity Connector* tool uses graph algorithms and collaborative filtering techniques.

3. PRELIMINARY RESULTS

We performed a user study with students from the Public University of Navarra enrolled in social worker and software engineering degrees. The total number of subjects who participate in the study are 50, of both sexes and an average age of 20 years.

Students performed several brainstorming sessions with two independent variables: session objectives and group modality. The session objectives relate to the type of problem presented to the group: creation of an innovative product or service from existing object. The variable group modality refers to how a group may be composed of people with similar background (homogeneous group), or people with different background (heterogeneous group), by one person (nominal group), by several people in oral communication (verbal group) or by several people in computer

communication (virtual group). Each of these group modalities has advantages and disadvantages and contributes differently to creativity. To assess these two tools to support creativity we take into account the quantity and quality of ideas generated at a given time period. We also apply questionnaires and interviews to determine the perception that users have of both tools.

Preliminary results concerning tool usability indicate that *Wikideas* capability to organize group ideas in different ways is adequate. Users confirm that it is very import to provide a graphical user interface that enable simultaneous visualization of ideas and input of new ideas. However in the performed studies there was little usage of other features of *Wikideas* such as the edition of other authors' ideas, linking different ideas or checking of idea version history.

Creativity Connector implementation is complex since it is difficult to establish which characteristics determine whether two ideas or users are similar or complementary. In the closed lab sessions there were not explicit connections among participants by means of virtual communications, however direct verbal communications emerge meanwhile and after sessions. As expected showing the alias of the author of an idea and all ideas of each alias (but not the real user name) decreases free-riding and increases ideas generation.

Preliminary evaluation of generated ideas indicates that extrinsic motivation is an important factor for the successful outcome of brainstorming sessions. The system was intended to be used after presential sessions, however only a few participants made use of it due to lack of reward being given to continuing participants. But social motivation was a great incentive for participants in heterogeneous groups which report competition among participants with different background to be a large incentive for idea generation; also ideas with different background stimulated more ideas in other participants.

4. ACKNOWLEDGMENTS

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