Evaluation Instruments for Creativity Support Tools

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ABSTRACT
Significant research has been dedicated to the development of creativity support tools, tools intended to amplify human creativity in the arts, sciences, and design disciplines. While examples of such tools abound, instruments are generally lacking to systematically and reliably assess these tools’ impact on the creative process. Without these instruments, it is difficult to identify what aspects of a tool’s design most positively affect the creative process. This workshop will focus on the development of evaluation instruments for creativity support tools. From this workshop, we expect a range of instruments to be proposed, explored, and eventually developed. These instruments will range from cognitive assessment instruments (e.g., modified forms of the NASA TLX), to heuristic evaluations for creativity support tools, to techniques that meld with qualitative methods.

Categories and Subject Descriptors
H.5.2 [Information Interfaces and Presentation]: User Interfaces – evaluation/methodology, user-centered design.

General Terms
Measurement, Design, Human Factors, Standardization.

Keywords
Creativity-support tools, instruments, evaluation, assessment.

1. INTRODUCTION
Creativity support tools seek to assist users when solving ill-defined problems in the arts, sciences, and design disciplines. The primary intent of these tools is to amplify an individual’s creative ability, enabling them to solve problems they could not otherwise solve, and to solve problems better, faster, and more creatively than they could without computational support [1].

A rich body of research has developed dedicated to the topic of creativity support tools. For years, the Creativity and Cognition Conference has served as an important vehicle for promoting and furthering research in this area. More recently, National Science Foundation (NSF) funding initiatives have arisen in the U.S. to encourage the development of the science behind the design of these types of tools.

While examples of creativity support tools exist, an open research challenge is the assessment of these tools. The need for evaluation methods for creativity support tools is acute, and has been emphasized in a recent NSF workshop on the subject [5]. Gerhard Fischer summarizes the following needs:

…development of new assessment approaches (what should be measured and what can be measured) including: differentiation between quantifiable and qualitative dimensions; identification of qualitative dimensions such as: personally meaningful activities, mindsets, relevance; evaluation techniques applicable to ill-defined, open-ended problems.

Existing research efforts typically employ mixed methods when assessing creativity support tools. However, many of the techniques and instruments used do not perfectly match the problem domain. For example, the NASA TLX [2] is an instrument intended to measure the cognitive and physical load associated with using a tool. While such measures are worthwhile when assessing a creativity support tool, this particular instrument caters to human factors research. As such, the language and questions in the instrument can seem confusing to subjects and unrelated to the task at hand when used to assess creativity support tools.

In this workshop, we will catalyze the development of evaluation instruments for creativity support tools. Attendees will identify best practices, enumerate unmet needs, and develop desiderata for future evaluation instruments. Our ultimate goal is to develop standardized methods of evaluation so that researchers working on similar problems can more easily evaluate research tools, compare tools, and make use of others’ findings in reporting their own results.

2. WORKSHOP PLAN
We will host a one-day workshop with the following schedule:

Morning
- Participants introduce themselves, their work in developing creativity support tools, and their current evaluation methodologies
• The group, as a whole, constructs an affinity diagram of existing evaluation techniques for creativity support tools
• From the constructed affinity diagram, specific evaluation needs for creativity support tools are identified and categorized

Lunch

Afternoon
• Breakout sessions: Sub-groups choose a particular evaluation need from the morning session and more fully develop this need, identifying issues unique to the evaluation of creativity support tools. Desiderata for a superior evaluation instrument are developed
• Sub-groups present their results
• Goals for the future development of evaluation instruments are developed
• A poster is created for conference attendees

End of workshop.

3. OUTCOMES
The expected outcomes of this workshop are “sketches” of new evaluation instruments specifically designed to assess creativity support tools. In a best case scenario, these tools will later be developed and refined by the workshop attendees. In this case, this tool set could lead to a special issue dedicated to the topic of creativity support tools.

As an example outcome of this workshop, one could imagine the development of a heuristic evaluation grounded in theories of creativity and tool design, similar to the specialized heuristic evaluation methods developed by Mankoff for ambient displays [3]. Or, the workshop might lead to a modified version of the NASA TLX or an adapted version of the Self-Assessment Manikin [4] that caters to open-ended tasks. The workshop might also lead to analytical lenses suited to the analysis of qualitative data collected as part of an evaluation.

The results of the workshop will also be compiled into a poster that will be presented to attendees of the HCI 2008 conference.

4. PARTICIPANTS AND PROPOSALS
The workshop attendees are expected to be active researchers of creativity support tools. While creativity is a broad topic that appeals to a wide range of people, our target group is researchers interested in the science of the design of these tools.

Researchers who wish to participate in the workshop should submit a two-page statement to the workshop authors. This statement should describe the researcher’s background in the area of creativity support tools, and describe the evaluation methods they have employed. The workshop statement should highlight a particular project in creativity support tools that the researcher is currently working on, and issues associated with evaluating the tools. The researcher should also indicate which type of evaluation instrument they are most interested in seeing developed (empirical, heuristic, qualitative or other). This will enable us to ensure a good mix of researchers and discuss a wide variety of evaluation instruments.

5. WORKSHOP ORGANIZERS
Dr. Celine Latulipe is an Assistant Professor in the College of Computing and Informatics at the University of North Carolina at Charlotte. Dr. Latulipe does research in human-computer interaction, specializing in novel interaction techniques, which have been published in UIST, CHI, and other venues. Recently, Dr. Latulipe has been applying two-handed interaction techniques to a co-located collaborative tool for artists and to a performance tool for dancers. She is currently experimenting with adapting empirical evaluation methodologies that will allow her to gather user perceptions about the creativity support tools she has developed.

Dr. Michael Terry is an Assistant Professor in the David R. Cheriton School of Computer Science at the University of Waterloo. Dr. Terry’s research in creativity support tools has been published in Creativity and Cognition, CHI, and UIST. Dr. Terry was the workshop chair for Creativity and Cognition 2007, and was an invited attendee of two NSF workshops on creativity support tools.

6. REFERENCES