Articulating Creativity in a New Domain: Expert Insights from the Field of E-Textiles

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ABSTRACT

Building on Csikszentmihalyi's conception of creativity as a system composed of the domain, the individual, and a field of experts who validate creative innovations, we examine a new domain of e-textiles to describe creativity. Further, we use our interviews with domain experts to outline some of the limitations of current assessment techniques to inform our understanding of creativity.

Author Keywords

Systems; Consensual Assessment Technique (CAT); Experts; E-Textiles.

ACM Classification Keywords

K.3.0 [Computers & Education]: General.

General Terms

Theory.

INTRODUCTION

While cognitive views of creativity have situated the source of creativity in the individual, more recent scholarship views creativity as the result of a systemic process. According to this view, creativity results from the interaction of a system composed of three elements: a culture that contains symbolic rules, a person who brings novelty into the symbolic domain, and a field of experts who recognize and validate the innovation. Csikszentmihalyi [3] further argues all three are necessary for a creative idea, product, or discovery to take place.

Of particular relevance to this poster is the role of the field in this scenario. In a systems view of creativity, the field includes all individuals who act as "gatekeepers to the domain". Social psychologists of creativity have further argued for new techniques that fit well with Csikszentmihalyi paradigm, including the Consensual Assessment Technique (CAT) pioneered by Amabile and colleagues [1]. This technique allows for the assessment of products' creativity by judges who are deemed to be "experts" in a particular domain. The panel is instructed to use their own subjective definition of creativity as they rate artifacts. Important to this technique, experts rate creativity relative to one another rather than against some ultimate norm. The CAT can inform what we know about the domain as well as what we understand about creativity more generally, especially since very few empirical studies have employed a systems view of creativity.

THE DOMAIN OF E-TEXTILES

The current study focused on an emergent domain of electronic textiles, or e-textiles, and employed a variation of the CAT analysis to stimulate a conversation among experts about creativity in this new domain. While e-textiles is a relatively new domain, the majority of its history was constrained to a small group of highly skilled artists capable of working with such materials. More recently, a construction kit called the LilyPad Arduino has enabled novices to embed electronic hardware into textiles [2]. The LilyPad Arduino toolkit is a set of sew-able electronic components, including a programmable microcontroller and an assortment of sensors that allows users to build their own soft wearable computers.

The recent launch of the first e-textile web community, LilyPond (http://lilypond.media.mit.edu), allows designers to share and display designs created using e-textiles. The community is currently being used by both a distributed group of Do-It-Yourself (DIY) e-textile designers as well as for youth participating in e-textile workshops across the United States to share the work created in these workshops. Because LilyPond is the only community of its kind within e-textiles, we limited our study to the discussion of just those projects displayed within the community (N=166).

ASSEMBLING A PROXY FOR THE FIELD

In order to better understand this emergent domain of e-textile designs, we assembled an external panel of pioneers in the e-textile domain. Each expert was chosen because of their contributions to the art and design of e-textiles, the creation of innovative materials for the industry, as well as their domain-specific teaching in higher education settings. This panel of experts met together to discuss work hosted in the LilyPond community and to better articulate what we know to constitute creativity within this domain.

The external panel independently rated a random selection of 25% of the artifacts contained in the LilyPond site, following procedures outlined in the CAT along three dimensions: (1) Overall Creativity; (2) Technique; and (3) Aesthetics. In addition, we asked them to define these categories, make suggestions for additional criteria, and comment on the individual projects. A quick analysis of inter-rater reliability revealed that there was relatively little

consensus among our field of experts. This is in line with prior work that has established expert artists as problematic for establishing inter-rater reliability. To find the root of this, we had the experts share their thoughts on creativity within this particular domain as well as what constituted a creative contribution to the online community. Our analyses focused on experts' articulations of e-textile creativity.

FINDINGS

Moving Beyond the Obvious

Two tensions emerged in the discussions, including the constraints of the tools as well as the evident "workshop approaches" where a large number of the projects were designed. As one participant pointed out, workshops are "a great way to get somebody started. But seeing if someone goes beyond the suggested model then does something new and innovative" is the true measure of creativity. They also noted the constraints of the tools, remarking that "there is a set of obvious projects people can do." Among these more obvious solutions, they categorized the projects into discrete categories, including "my first LED" and "my first switch" projects. Beyond that, the panel saw projects that were "actually trying to make a piece of textile and conform it to the body." The connection between textiles, body, movement, and performance became an important part of the discussion as the inferred use or the history of the creation became an important consideration in their judgments. Lastly, the panel noted that there was "a huge leap" to the projects that became "much more considerate" and more "art projects as opposed to exercises." Taken together, these observations suggest several categories relevant in developmental trajectories in creativity.

Different Markers of Creativity

While the panel agreed upon these general categories, they didn't agree on how they ranked among one another or on the other qualities that made something creative. One member stated that creativity was marked by "subverting the first level assumptions that one might make…like putting the LED on the inside instead of the outside. Putting it really close to a sexual part of your body, which is delicate or forbidden." Other members of the panel argued that there is creativity in "use of form, design elements, color, form, and materiality". Others argued that it was important in their considerations that "things moved beyond the concept of the (simple) circuit and actually started to get into context." For example, thinking about not just a switch as a switch but as interaction, for instance a dance costume that placed sensors to detect movement. Lastly, another participant remarked, "I'm really into modularity and also iterations so those were two things that I thought". For each of the panel members, the core of their definitions of what defined a creative act differed and was deeply rooted in their own creative practice, which we assume is one reason that it was difficult to establish inter-rater reliability.

Evaluating Creativity in Diverse, Online Communities

While most prior studies have used the CAT to study parallel products and more recently non-parallel artifacts compiled from standardized tests, few studies have used these techniques to evaluate a more disparate online community, which is one alternative explanation for why we were unable to establish inter-rater reliability. However, online communities (as opposed to standardized tests) represent a more authentic domain for the study of creativity (rather than a controlled setting). While some of the panel members were frustrated by this, others remarked "it was interesting to actually question what I think creativity might be, by actually looking and accepting the fact that there are these different categories of projects." This sort of informed reaction closely parallels the role of experts in shaping the domain, and is more closely aligned with the original model outlined by Csikszentmihalyi [3]. Beyond the difficulties for evaluation, online communities also inject a few other layers of information important to the evaluation, including the quality and detail of the images (especially in considerations of craft and technique), the accompanying text (those that had nicely written statements or detailed the struggle with the materials were viewed more favorably), the positionality of the creator (non-traditional creators were viewed more favorably), as well as the choice of the textile itself (who made it and who chose the textile became a key consideration).

CONCLUSION

Few studies have tried to evaluate what it means to be creative in a new domain, particularly in the context of fast changing technology. For further studies, we suggest to focus on project-sharing online communities with shared affinity in a field like e-textiles as a more authentic domain for the study of creativity rather than a controlled setting that were favored in previous research.

ACKNOWLEDGMENTS

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