Designing Futures for Learning in the Crowd:
New Challenges and Opportunities for CSCL

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Abstract: The Internet and other media technologies have ramped up collective collaboration into an entirely different phenomenon called crowdsourcing. Many people, connected through the Internet, are contributing ideas and information to several projects in business and science. Crowdsourcing can offer individuals and opportunity for sharing their expertise, express their creativity, and learn new knowledge and skills. However, this model of technology-enabled collective collaborative process, where a known few are replaced by an indefinite many, has deep and diverse implications for education, especially for self-directed learning. Crowdsourcing can be disruptive and this disruption can have both positive and negative consequences for teaching and learning. This workshop will bring together researchers and practitioners interested in crowdsourcing, to discuss challenges and opportunities for learning in an interdisciplinary manner with the goal of articulating an agenda for future research.

Keywords: citizen science, crowdsourcing, learning, mass participation

Workshop theme

In recent years, the Internet and other media technologies have ramped up collective collaboration into an entirely different phenomenon called crowdsourcing. Crowdsourcing can be defined as a type of participative online activity in which a group of individuals of varying knowledge, background and number – that is, a crowd – is invited, via a flexible open call, to engage in the voluntary performance of a task or the solution of a problem (Estellés-Arola & de-Guevara, 2012). Many people, connected through the Internet, are contributing ideas and information – not monetary contributions, though – to several projects in business and science. For example, a large subset of crowdsourcing is referred to as *citizen science,* a term used by the American researcher and educator Rick Bonney to refer to public participation in scientific research (Rosner, 2013). In recent years, several projects labeled as "citizen science" but encompassing different forms of public participation have been developed. Such forms range from projects mobilizing masses of people performing large quantities of small, simple and standardized tasks at a scale only possible using computers, to DIY projects in which participants move away from doing "traditional" science, develop creative uses of existing equipment and find new solutions to existing problems, to deliberative democracy exercises involving citizens in deliberation and change of opinion on scientific issues. Amongst the most well-known examples of citizen science projects, we can include Galaxy Zoo (http://www.galaxyzoo.org/), an online astronomy project that invites members of the public to help in classifying over a million galaxies, and FoldIt, an online game developed by scientists at the University of Washington, in which participants try to predict protein folding, one of the hardest computational problems in biology.

Crowdsourcing can offer individuals in the crowd an opportunity for sharing their expertise, express their creativity, and learn new knowledge and skills. Therefore, it can be argued that the technologies providing a backbone for running crowdsourcing applications also give rise to several forms of learning. Some popular forms of crowdsourcing for learning can be found in question-and answer sites, such as Quora and Yahoo Answers, and other approaches to problem solving and crowdsourced work, such as Amazon's Mechanical Turk and Innocentive (Dron & Anderson, 2014). These examples provide instances of crowdlearning. In a recent report aimed to explore new forms of teaching, learning and assessment, Sharples et al. (2013), defined crowd learning as "the process of learning from the expertise and opinions of others, shared through online social spaces, websites, and activities" (p. 20). The authors also characterized crowdlearning as a form of learning often occurring informally and spontaneously, and where virtually anybody can be a teacher or source of knowledge.

We argue that this model of technology-enabled collaborative process, where a known few (teachers, for example) are replaced by an indefinite many, has deep and diverse implications for education, especially for self-directed learning. Crowdlearning can be disruptive and this disruption can have both positive and negative consequences for teaching and learning. For example, the increasing access of people to the expertise and opinions of others can challenge the balance of control between educators and experts and the wider public. Thus, it is important to be aware of how increasing levels of access to distributed information and knowledge affect the type and levels of participation, and whether this limits potential value of education. Furthermore, for some scholars, e.g. Nickerson (2013) and Anderson (2011), crowdsourcing is an approach that leverages the individual strengths of human and machine processing. Nickerson referred to the use of the term *human computation* to describe crowdsourcing as a phenomenon where humans performing tasks act as computational nodes in a network, and computers aggregate the results. Furthermore, we can argue that there is a "paradox of learning" in some crowdsourcing projects. For example, several citizen science projects rely on low threshold cognitive abilities and exert a control over participants' learning. In these cases, participants do not need to have any specific subject knowledge or particular skills, but are expected to follow detailed instructions and are discouraged from bringing their own experience and world knowledge to bear on the task at hand. Learning is thus unwanted from the perspective of neutral observations. These projects do not seem to entail crowdlearning as defined by Sharples et al.

Apparently, learning in crowdsourcing settings is still a largely unexplored topic in CSCL. For example, browsing the content of the *International Journal of Computer-Supported Collaborative Learning* (ijCSCL) since its inception, we have found one article on mass collaboration. As Cress, Jeong, and Moskaliuk noted in a call for contributions to an edited book on mass collaboration and education, less than 10% of the articles appeared in ijCSCL addresses groups that exceed the size of a school class. Furthermore, usually the studies of these groups are more closely guided by instruction than being situated in informal settings, in which most phenomena of mass collaboration are located. At the CSCL conference held in 2013, a symposium on "Mass Collaboration – an Emerging Field for CSCL Research" addressed the aspects of mass collaboration that have potential for education and learning and are thus of interest for the learning sciences (Cress, 2013). As Cress pointed out, the lack of attention for this topic is unsurprising, given that CSCL as a research field has always privileged the study of small groups of students in a neatly arranged situation. During that symposium, three examples of mass collaboration were presented, including citizen science.

Recognizing a clear continuity with the symposium organized by Cress in 2013, this workshop aims at carrying forward the dialogue about the current challenges and opportunities for CSCL research in the context of crowdsourcing.

Goals of the workshop

We intend to address critically these issues in an interdisciplinary manner, and/or present visions of how to enhance learning in crowdsourcing settings. To this end, we invite different types of contributions from empirical, theoretical, conceptual, and design based approaches. Guiding questions and topics can include but are not limited to:

- What is the nature of learning in crowdsourcing and how is it different from learning in other settings, both formal and non-formal? Which theoretical perspectives can be fruitful to examine and support learning in crowdsourcing settings?

- What is the nature of learning in the different forms of crowdsourcing (e.g. mass mobilization, DIY)?

- What kind of activities better support learning in crowdsourcing settings? Convergent or divergent tasks? For example, convergent tasks lend themselves to yes/no answers, but divergent tasks, such as idea generation, do not.

- What is the role of artifacts in coordinating activities conducted by vast numbers of people?

- Minimizing the distinction between teachers and learners is not without risks. A potential danger of crowdlearning is that it could provide users with massive volumes of unvetted "information" which turns out to be unclear, misleading, or just plain incorrect. How can internal systems of reputation and reliability help solve this problem? How can knowledge be "validated", especially in absence of traditional markers of expertise?

- Crowdlearning is fast and personalized. However, it depends on a kind of volunteerism from others: a group of well informed, interested, and invested knowledgeable people who will contribute their knowledge, even without any formal compensation. How can this form of volunteer contribution be sustained?

- Platforms designed for crowdlearning try to motivate learners to participate and inspire their contribution through the use of gamification (for example, use of medals, points, titles, etc.). Which learning design approaches can be fruitful to improve these platforms and support learners?
- What is the potential of learning in crowdsourcing settings for empowering people and, in a wider perspective, what are the implications for democratic participation? Another related aspect is how these two elements, that is, the potential for empowerment and democratic participation, can be institutionalized or coupled with already existing institutions.
- How can we control learning in crowdsourcing settings?

Workshop activities
The workshop is planned as a full day event involving max 25 participants. It will also involve additional online activities organized both before and after the workshop.

Pre-workshop activities
At least one month prior to the workshop, the accepted papers will be circulated among the participants, who will be invited to read them before attending the workshop. Accepted papers will be posted to the workshop website before the workshop to prepare the attendees for discussions during the event.

Workshop program

Part 1: Opening plenary
Members from the CSCL community as well as from other research areas will present their perspectives.

Part 2: Introductions and Lightning Talks
In 1 minute, participants describe who they are and why they are in the workshop. In additional 5 minutes, participants present the main point(s) of their papers.

Part 3: "Designing Futures" Workshop Approach:
- *Critique*: Participants generate 30-second statements of issue(s) currently faced in crowdsourcing in relation to learning. These statements can be drawn from their workshop submissions.
- *Vision*: Turning critiques into brief 30-second positive statements addressing "What would you make different?" Participants will be encouraged to not think of obstacles at this stage. Participants will vote on a small subset of visions to work on the next phase.
- *Implementation*: Participants will spend the bulk of their time in this phase, collaborating on plans to carry out the vision. This may involve generating project plans, articulating design principles, or paper outlining. In small groups, the implementations will be presented/shared with other workshop participants.

Post-workshop activities
Summary: the outcome of these discussion summaries will form ongoing collaborations leading to a special journal issue on crowdsourcing and learning. This special issue would feature expanded versions of the authors' workshop papers.

Participation procedure
Authors are invited to submit a short "vision" paper (max. 3 pages, following the CSCL conference template) that possibly connects to the guiding questions and topics listed above. In this vision paper, authors can choose a setting or specific scenario related to crowdsourcing and learning. Submissions should address three questions:
- What main issue(s) do you see in relation to crowdsourcing and learning?
- What is your vision for addressing those issues?
- How would you plan to carry out that vision?

In addition, please provide a 100 to 150-word biography to describe your interests in relation to the theme of the workshop. The workshop welcomes different kinds of contributions addressing challenges and opportunities for learning in crowdsourcing settings. Such contributions can include conceptual frameworks, descriptions of case studies and empirical work, and position papers. A program committee will be drawn from

collaborators and colleagues, who will review all the submissions based on the relevance to the workshop theme, supporting a diversity of topics and disciplinary backgrounds. We will accept up to a maximum of 15 papers to ensure that each participant can make a short presentation. Papers reviewed and selected by the program committee will be published on the workshop website.

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