Chapter 16
Collective Intelligence in Online Education

Lesley S. J. Farmer
California State University – Long Beach, USA

ABSTRACT

Collective intelligence may be loosely defined as the capacity of a group to think, learn, and create collectively. Online education reflects an interactive mode relative to information, particularly because of social media, that can involve expertise and resources that generate collective intelligence to address issues. Several theories reflect a belief in the dynamic and situational meanings that collectives create. The impact of technology, particularly in terms of social networks, also informs collective intelligence-related educational theories. This chapter explains conditions for optimum use of collective intelligence, noting individual and group behaviors, cultural factors, and its application in online education.

INTRODUCTION

The foundation of democracy is faith in the capacities of human nature; faith in human intelligence and in the power of pooled and cooperative experience. It is not belief that these things are complete but that if given a show they will grow and be able to generate progressively the knowledge and wisdom needed to guide collective action.... While what we call intelligence be distributed in unequal amounts, it is the democratic faith that it is sufficiently general so that each individual has something to contribute, whose value can be assessed only as it enters into the final pooled intelligence constituted by the contributions of all. -- John Dewey, "Democracy as a Way of Life", a 1937 speech cited in Introductory Readings in Philosophy, Robert R. Ammerman and Marcus G. Singer, Editors (Brown, 1960) pp. 276-277.

Today's wisdom society depends on intellectual and social capital, that is, collective knowledge and informational assets. Increasingly, online education reflects a more interactive mode relative to information, particularly because of social media. As heterogeneous groups bring different expertise and perspectives, their gathered and organized knowledge can lead to more informed decisions and resultant

actions. This collective intelligence has been transformed with the advent of easily accessible interactive technologies. This chapter explains collective intelligence, the conditions for its optimum use, and its transformation in online education.

BACKGROUND

Collective Intelligence

Collective intelligence may be loosely defined as the capacity of a group to think, learn, and create collectively. Aulinger and Miller (2014) stated that "Collective intelligence is the degree of ability of two or more living things to overcome challenges through the aggregation of individually processed information, whereby all actors follow identical rules of how to participate in the collective" (p. 3). The adage of "the whole is greater than its parts" intuits the power of collective intelligence.

Collective intelligence builds on the notion of social learning. Surowiecki (2004) asserted that collective intelligence combines cognition, cooperation, and coordination. Tapscott and Williams identified four underlying principles: openness, lateral collaboration, sharing, and global action. Malone, Laubacher and Dellarocas (2010) identified four collective intelligence "genes": what (the goal), who (the participants), how (the structure and processes), and why (incentives). Collective intelligence is distinguished from collaboration in that a specific goal is identified, processes of interaction are aligned with that goal, and decisions are made as a unified group. Other features of collaborative intelligence include group and individual accountability, trust, interdependence, distributed leadership, and group autonomy.

Gregg (2010) proposed seven principles for collective intelligence application: task-specific representations, user-added value, data centrality, facilitated data aggregation, facilitated data access, facilitated access for all devices, mentality of continuous change and improvement. The following list is representative of situations that benefit from collective intelligence: decision-making for complex issues, research projects, annotated lists and texts, grants and awards, peer reviewing, databases and repositories, and knowledge management.

While a case may be made that collective intelligence has existed for centuries in the form of projects and repositories in knowledge such as libraries, collective intelligence has been transformed, similarly to information, by technology. Advances such as cheaper hardware and Internet connectivity, open source resources and freeware, and web-based platform interoperability have greatly expanded access, and sped up processing. Contributors can input, archive and retrieve data and documents (e.g., images, videos, research, assessments) on the Internet in social networks and collaborative applications such as Google Docs, databases, and remote servers ("the cloud"). Technological tools can organize and link documents in meaningful ways as defined by the participant group. Automated agents can classify and filter participants' input, thus facilitating expert validation and organizing of results to offer new collective intelligence. Social media, in particular, facilitates real-time effective generation of ideas and instant feedback that can be looped back into the discussion so that much larger groups can participate.

Supporting Theories

Several theories support collective intelligence. These theories build on self-perceptions and self-worth, which are often developed in light of social interactions. Several of the theories also reflect a belief in

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