# Chapter 8
# Using Virtual Environments to Transform Collective Intelligence

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

## ABSTRACT

*The wisdom society is the latest iteration of the idea of collective intelligence, which has accelerated due to social media and other online collaborative tools. This chapter offers a background on information, collective intelligence and its elements, virtual environments, and theories that relate to collective intelligence. Benefits and issues related to collective intelligence are detailed, and conditions for optimum collective intelligence, including its transformation through virtual environments, are explained. Individual and group dynamics, and group models are also discussed in terms of their impact on collective intelligence in virtual environments.*

## INTRODUCTION

The adage "Two heads are better than one" was never more true than now. The world is changing faster than ever because of social and economic factors, which have been significantly impacted by technology. Today's wisdom society depends on intellectual capital, that is, collective knowledge and informational assets. Increasingly, the global scene 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 virtual environments.

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## BACKGROUND

### Information and Its Transformation

The 21st century has marked the democratization of information. Particularly with the advent of social media and low-cost Internet-connected equipment such as mobile devices, a substantial percentage of the population can not only access digital information, but can also comment on, and create, information. Such ease of content generation can also lead to a loss of quality control; information is more readily available but might not be accurate, legitimate, or objective. Individuals need to draw upon past knowledge and experience to determine the validity, relevance and significance of information accessed.

The nature of information itself has been affected by digital technology. Besides the obvious combination of text, image, and sound, technology facilitates the repurposing and transformation of information to address different objectives or different audiences. Indeed, content has been decoupled from its "container" such that concepts may be represented as a podcast, book, or email, each format of which may impact how the audience understands the content therein.

Moreover, applications such as Google docs and wikis enable participants to literally change documents on the fly, thereby putting at risk the concept of a permanent recorded document (Iacono, 2010). That dynamic nature of information can also endanger common understanding as individuals may be drawing upon different versions of a document, each of which differ in the content and its interpretation.

### Defining and Contextualizing Collective Intelligence

Collective intelligence may be defined as the capacity of a group to think, learn, and create collectively. The adage of "the whole is greater than its parts" intuits the power of collective intelligence. Surowiecki (2004) asserted that collective intelligence combines cognition, cooperation, and coordination. Tapscott and Williams (2006) 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).

Educator John Dewey variously discussed the importance of social and collective intelligence as means of the communities having the opportunity to draw upon experiences and individual minds to achieve economic and cultural advancement together, transcending the limitations of any one person (Dewey, 1937). "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" (p. 276).

The underlying concept of collective intelligence builds on the idea of social learning. Vygotsky and Luria (1994) asserted that learning exists first between people and then is internalized. The most common way to learn socially is through collaboration: typically, small groups working together towards a common goal or solution. Other features of collaboration include group and individual accountability, interdependence, distributed leadership, and group autonomy. 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.

Collective intelligence is witnessed in many sectors of society: politics, business, science, health, and education. Moreover, several forms of collective intelligence exist (Atlee, 2008). Wikipedia is probably the best known example of communications-based informational collective intelligence through gather-