Moods, Wicked Problems, and Learning

Peter J. Denning

Deck Text: Wicked problems and learning environments present tough mood challenges for leaders and teachers. Telepresence and sensory gadgets are unlikely to replace physical presence in these areas.

Peter J. Denning (pjd@nps.edu) is Distinguished Professor of Computer Science and Director of the Cebrowski Institute for information innovation at the Naval Postgraduate School in Monterey, California, is Editor of ACM Ubiquity, and is a past president of ACM.

In the previous column (December 2012), we discussed the importance of understanding and being able to interact with different moods of individuals and groups. Positive moods enhance individual and team performance; negative moods detract and can render teams and groups dysfunctional. Skilled managers, facilitators, and teachers are keenly aware of moods and emotions. They know how to guide their teams through the moods necessary for a successful project, problem resolution, or learning.

There has recently been a lot of discussion about the role of technologies in two important areas: resolving wicked problems and learning. Managing moods is very important in these areas. I am very skeptical about telepresence proposals for these areas: they obscure moods.

Moods for Wicked Problems

Many modern social and technology challenges can be classified as wicked problems. A wicked problem is a very messy social tangle [den10]. All prior attempts at solving it have failed. No one has enough power or resources to impose a solution, but everyone has enough power to block someone else’s
disagreeable proposals. The underlying difficulty is that the participants do not have a shared interpretation of the issue and they distrust each other; therefore, they cannot generate a mood of solidarity to move in any direction. It may even compound their difficulties to call their issue a “problem”, since they cannot even agree on a problem statement.

The term “wicked problem” is also used for problems in complex systems. The players agree on a problem statement, but cannot find a solution because extreme complexity hides it. Climate change modeling or finding effective new drugs look like wicked problems in this sense. With enough time and effort, we can find enough structure and recurrences in the system to solve these problems. The recent discovery of the Higgs boson at the CERN facility in Switzerland culminated a search by 5000 physicists spanning nearly 50 years.

I dislike calling complex-systems problems “wicked”. I want to reserve the term for social tangles. No amount of scientific understanding will resolve social tangles; we have to address to core issue of the human disagreement and see if any agreement can be found.

Skilled facilitators have worked out processes that help the parties in a wicked problem find agreement; examples are the Appreciative Inquiry, Layton-Strauss, and Charrette processes [dey08, ded10]. Trained facilitators help the parties find a shared interpretation and develop action plans to move with it. The process can be described as a series of moods:

1. Appreciation. Each player comes to appreciate all the points of view and concerns of the others. Some players modify their own concerns in the process. They develop a feeling that their concerns are understood and appreciated by the others.

2. Speculation. The players cooperate on developing some possibilities for action, but do not commit to any particular action. After the possibilities are out in the open, they sort through to find out which ones take care of concerns in the group. This will help select a small set of promising actions.

3. Resolution and ambition: The group commits to actions, usually performed by different teams tackling different aspects of the issue. The group sees the teams as parts of an experiment -- try multiple actions and see which ones produce movement.

4. Follow up: The group assigns managers to watch over the various action teams and see them through to completion. They agree to meet together again to renew their shared interpretation, evaluate previous actions, and commit to new actions.

The skilled facilitator can sense when the group has achieved each of these moods and only then moves on to the next stage. If the facilitator tries to push to the next stage too soon, the whole process may fall apart.

Moods for Teaching and Learning

Learning is not just a classroom activity; it is a team activity and professional
responsibility. In the previous column, a table listed moods commonly encountered in the workplace. Seven of them directly affect learning -- wonder, curiosity, inquiry, perplexity, apathy, and confusion. Learning from a mistake or breakdown is much harder if the person has a negative mood about it. The best moods are wonder and curiosity: the person knows there is something to learn, desires to learn, and embraces that something good will come from learning. The worst moods are apathy and confusion: the person is either indifferent or is annoyed at the mistake or breakdown and blames it on someone or something else. The teacher or manager seeks to transform the mood of a confused person to inquiry, curiosity, or even wonder.

Managers who espouse “fail fast and often” are trying to predispose their people to accept failures and mistakes, inquire into what can be learned, and take new actions. They are trying to dispose their people toward wonder and inquiry, and away from confusion, procrastination, and resentment over wasted effort.

Recall situations where you did not know what to do, or you were surprised that an event did not go your way. How did you react? Do you have a conditioning toward confusion and away from wonder or inquiry? Do you procrastinate when you see that an inquiry might be useful?

Other moods come into play when it comes to learning to function effectively in a domain. Hubert Dreyfus discusses six stages of learning: beginner, advanced beginner, competent, proficient, expert, and master [dre01]. Each stage marks a deeper level of embodiment of skill in the domain. The beginner has no embodied skill and performs solely by following the rules told by the teacher. The master relies completely on embodied skill and does not consciously apply rules when performing. The beginner is not attuned to the moods and emotions of people in the domain; the master is exquisitely attuned. Each stage has characteristic mood that a teacher must foster. Only a person at a higher stage can be an effective teacher for a person at a lower stage. Viewed in this way, the learning process is a rich trove of moods.

Can It Be Done By Telepresence?
It is interesting that so many common patterns of collaboration -- one-on-one, teams, wicked problems, and teacher-student -- all depend on individual and group moods. The skilled manager, leader, teacher, or facilitator must build on positive moods, re-channel negative moods, and remove from the team those who will not give up toxic moods.

Given that many teams and classrooms are now dispersed, it is important to ask how well can a leader perform these functions from a distance. Can telepresence replace physical presence? Can we deal effectively with emotional issues in the workplace via email? Can we operate small teams with Skype videoconference? Can we manage larger projects with Cisco Telepresence? Can we facilitate a wicked problem group on the Internet? If not now, are there tools on the horizon that would permit any of these things in the future?

Let’s consider some of the media available now. Email is very good when
we have expository communications or simple coordination actions (requests, promises, deliveries, settlements). But it is notoriously bad for dealing with emotional people or situations. Email users are well advised to avoid responding to emotional emails and instead to call or visit the other person.

Similarly, it is very difficult to conduct a speculation by email or other online venues such as a real-time wiki that only share written statements. Without presence, all the subtle cues of gestures, postures, voice tones, mood sensing, emotional reactions, and excitements are missing or hard to gauge.

Some teachers have successfully used in-class “clicker” systems to get quick student feedback on comprehension questions. But experiments where meeting participants click “mood meters” to signal their moods have proved superficial because many participants do not understand their own moods, and because linguistic indicators are not complete characterizations of moods. When the group members already know each other well, a videoconference can work because the team members have already developed a background of trust.

In the 1960s, Paul Eckman created a facial action coding system (FACS). That system has been perfected over the years and has married with modern vision processing to give us sophisticated technology for inferring people’s emotions from facial expressions. Market researchers use FACS software to discover how people are reacting to ads (see Emotionomics, by Dan Hill, Kogan Page Publisher, 2010). It is not hard to imagine a system in the near future that individually tracks the facial expressions of everyone in a meeting and provides the facilitator with a display showing the kinds of emotions in the room and giving display markers that zero in on faces with particular emotions. Still, such a sophisticated system is unlikely to duplicate the skilled facilitator. It provides its information only through a visual channel. It cannot provide information of the richness sensed in the body by the facilitator moving around the room among the people.

Hubert Dreyfus, noted above, devotes a whole chapter to the issue telepresence in teaching. His question is: how far up on the learning scale from beginner to master can a student progress when the only contact with the teacher is via automated courseware and telepresence? Telepresence would include real time voice and video interaction between student and teacher, video feeds that permit students to see what the teacher sees and vice versa, and tight integration with display tools such as presentations, pictures, images, and sounds. It would also require technology that supports two-way eye contact -- generating the mutual feeling that the other person is looking back at you and is present with you. From an examination of teachers in classrooms, Dreyfus concludes that teachers are exquisitely sensitive to the moods in the room. How do teachers tell when students are generally receptive to a topic or discussion? When they engaged? That a student’s question resonates with the whole class? That a quiet student has a burning question? Experiments with special tracking devices that permit an observer to see exactly what the teacher sees, show that observers cannot sense the moods that the teacher is responding to.

For all these reasons, Dreyfus concludes that today’s technologies are barely able to allow a telepresent teacher to guide a student up to the level of
competence. Dreyfus is very skeptical that we will figure out how to do the higher stages via telepresence. The human body’s ultra sensitive ways of detecting and responding to moods and emotions are not likely to be simulated by machines any time soon.

Still, the future is full of surprises. The picture may be brighter for a judicious combination of telepresence and physical presence. MOOC, massively online open courses, is a new generation of courseware now making college courses available for free. The organization of material and production quality makes them better than many existing courses. They permit much better interactivity with the teacher than in a 500-student amphitheater. Students form their own group “meets” in local Internet cafes so that they can physically study together. Their instincts to meet overcome the limitations of the Internet by fostering the positive moods of learning. If a local study group includes an experienced coach, the students might be able to move up the learning ladder effectively. Dreyfus may be right that “pure” telepresence cannot do the job, but coached hybrids might.

Conclusion

Two contemporary challenge areas commanding a lot of attention -- wicked problems and education -- are approachable by leaders and facilitators skilled at reading moods and guiding others to the moods needed to reach their goals. Technologists who believe they can replace facilitators and teachers with machines -- such as pure telepresence and social media gadgets -- are mistaken. The human body is exquisitely sensitive to subtle signals that enable it to read moods. No one knows how to sense, transmit, or receive these signals. In these areas, humans must remain in the loop.

End Notes