

## Designing for Deep Conversation in a Scenarios-based e-Learning Environment

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### Abstract

*While synchronous and asynchronous applications such as chat and email effectively foster casual communication, such applications are less successful in facilitating deep, insightful conversation. This is a particular challenge when asynchronous threaded discussion forums are used in e-learning settings. This paper examines the implementation of discussion forums in the context of WisdomTools Scenarios™, an e-learning tool which exploits case-based narrative to provide authentic contexts for asynchronous, collaborative persistent conversations. An analysis of usage from two independent scenarios, one used in an academic context and the other in a corporate context, shows that embedding forums within narrative scenes encouraged learner involvement and focused conversation. At the same time, we identify directions for improving the interaction design of these forums, including the ability for learners to join and “catch up” in ongoing conversations, tools to view summarization postings and track learner participation, and the use of social proxies. Ultimately, our goal is to understand how narrative-based e-tools may lead to deeper learner insights, smarter strategies, and better judgments.*

*I do art, and I do science, and I call it design.* [8]

### 1. Introduction

In recent years, there have been a number of attempts to visualize and track the social interactions of large groups of people engaged in computer-mediated conversations such as newsgroups and chat circles [11] [2]. Design research has focused on the creation of social proxies, graphical representations of participant

presence and activity [6]. However, little attention has been given to design improvement of small-scale persistent conversations such as those that occur in asynchronous e-learning environments. In these settings, small teams (fifteen or fewer learners) engage in facilitated forums. Their goal is to generate deep conversations that demonstrate smart strategies, contextually sensitive judgments, big concept generalizations, and new insights.

In a classroom, learning occurs through teachers and students conversing: questions are asked, responses are given, information is shared, examples are provided, and emotions are visible. In an e-learning discussion forum, learning also depends on teacher-student and student-student interaction. But what makes a computer-mediated conversation among learners and facilitator deep? Is it the conversation's length, the relevance and usefulness of each interaction, the degree of analysis and synthesis, the amount of effort put forth by the learners or some combination of features? The need for quality discussions is particularly great in an e-learning environment focused on the development of “practical intelligence” [14] or tacit knowledge [10]. In this setting, contextual exemplars and exploration of meaning are important vehicles for learning.

*WisdomTools Scenarios™* (Scenarios) is an e-learning tool which exploits case-based narrative as a way to provide authentic contexts for asynchronous, collaborative persistent conversations [12]. The Scenarios tool is used by corporate and government organizations, as well as by academic and non-profit institutions. The goal of Scenarios is to facilitate the development of learner strategy, judgment, and insight in settings where the procedures are less than obvious and the rules are “shades of gray,” context-based, and where there is no single solution but rather tradeoffs among a sometimes unknown set of options. An example of tacit learning is the appropriate

implementation of an organization's ethical guidelines in complex consulting engagements. Topics such as leadership, coaching, evaluation research, and running a global cyber-security initiative are also candidates for scenarios-based learning. Computer science, chemistry, and how to calculate a *t*-test are less suitable to this instructional approach. However, examining the contexts for software engineers developing new applications, chemists engaging in drug discovery, or statisticians participating on research teams would be an appropriate use of Scenarios.

In this paper we discuss the current design of Scenarios with particular emphasis on the conversation activity in the discussion forum and how it relates to the narrative. We describe our experience with this approach, present our analyses of an academic and a corporate scenario, and propose new design considerations for scenario conversations. We conclude by considering the possibilities for future design research of small-scale persistent conversations in a narrative context.

## 2. Scenarios

Rather than presenting abstract rules or information out of context, Scenarios presents a story. The narrative includes characters, events, and episodes. Each episode is revealed over time, engaging the learner in an unfolding and memorable experience. Figure 1 (top) shows the episode's structure – a set of horizontal timelines and events. Each timeline corresponds to one or more characters, groups, or locations. Icons on each timeline represent events associated with the character (or group or location); in Figure 1 (top), events 2 and 5, for example, are associated with Michael Decker; events 3 and 8 are associated with Cynthia Rollins. When the learner clicks on an event icon, it opens as in Figure 1 (bottom). The episode map provides the learner with a "bird's eye" view of the story as it unfolds, affording a complete view of character interaction and thought. A new episode is revealed after the team has had a sufficient amount of time to study each event, read the responses, and participate in the collaborative activities. New episodes are opened typically one week after the previous episode opened.

Learners are grouped into teams and work collaboratively (albeit asynchronously) on activities that help them relate the narrative to their work or life setting. A facilitator often participates in these activities, prompting the learners to explore alternative perspectives or clarify their own points of view. Facilitators typically are senior staff in the organization

and trained to fulfill this role during the scenario experience. The facilitator also works asynchronously. A knowledge layer, a set of digital resources including Web links, underpins the narrative; it is located below the timelines on the episode map.

Discussion forums, employing a conventional threaded structure, are distributed throughout the scenario; each forum is associated with a particular event. Each discussion is prompted by a question or statement. For example, in the scenario, "A Community Response to Hate," which focuses on individual and community strategies for responding to hate crimes, the discussion prompt is: "Where is the line between hate speech and free speech? Suppose hate speech can be directly responsible for violence against the minority. Did the person who put the leaflet on the porch have the right to do this? A legal right? A moral right? What would be 'offensive' to you? Consider the questions and concepts posed above, and construct your response. Return to this activity later and view the other team members' contributions. Join in the conversation." Figure 1 (bottom) shows learner postings. An "F" is a posting from the facilitator. A flag adjacent to a note indicates an unread note.

The goal, of course, is to engage learners on the team in a thoughtful discussion on the prescribed question or prompt. Unlike large-scale general discussion forums pertaining to a myriad of topics, conversations within Scenarios are linked to the scene and selected resources, establishing a "common ground" [15] or shared knowledge among the learners. This leads to focused and relevant postings, whether they are new notes or replies to existing notes.

### 2.1 A tale of two scenarios

To better understand learner behavior in Scenario forums, we examined two different Scenario Types: one with an academic focus, "Working in Teams," and one with a corporate focus, "Identifying, Targeting, and Delivering Value to Clients." We chose the first and last discussion forum (Posting Order) from each scenario, forming a 4x4 matrix: Academic and Corporate forums, and First and Last forums.

The initial analyses examined the number of words per post and the number of replies per post (in a threaded discussion, a reply is a post that is a response to an earlier post). An ANOVA was used to analyze the data (Table 1). Not surprisingly, the main effect of Scenario Type was significant: notes posted to the academic forums were significantly longer than notes

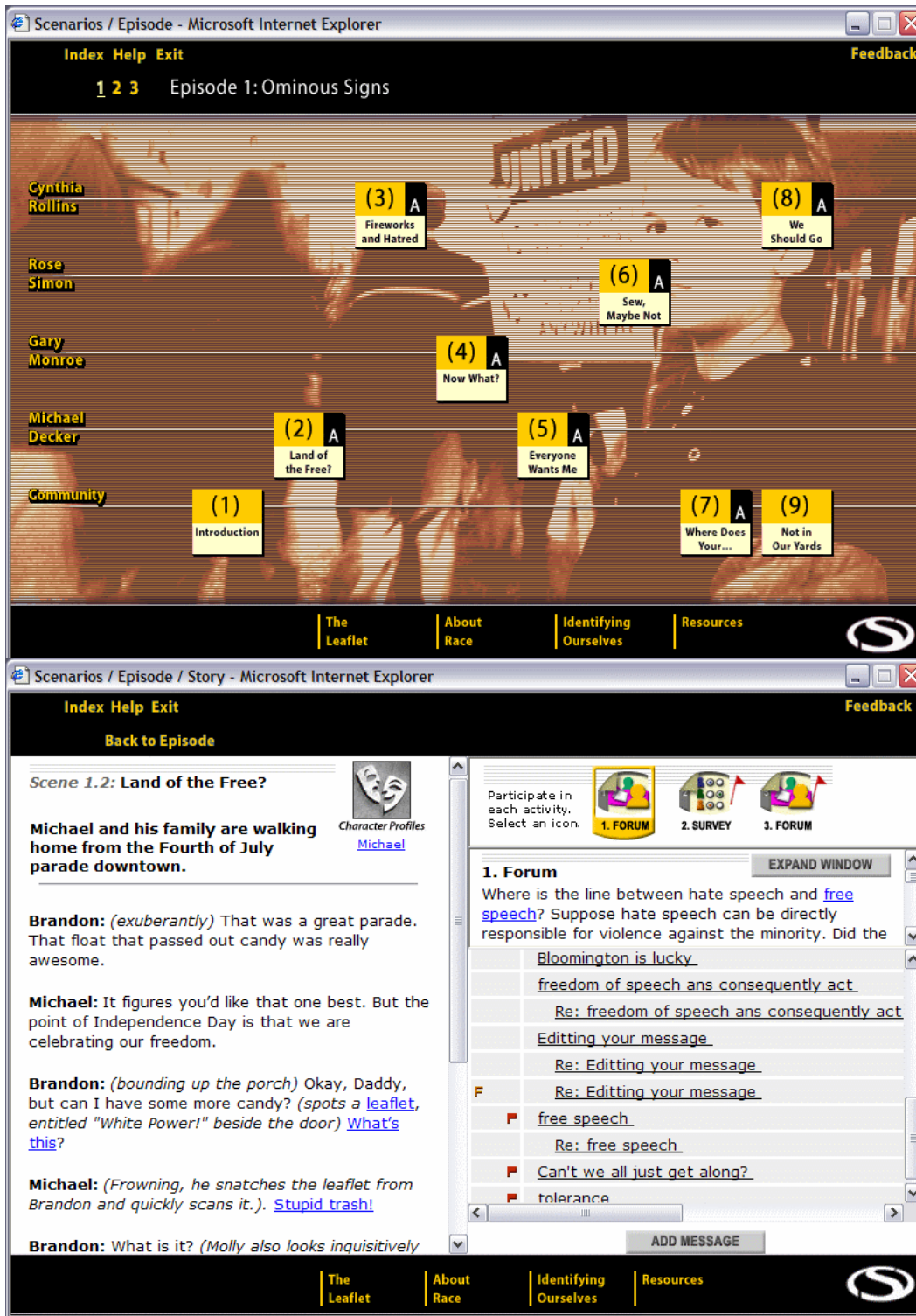


Figure 1. (Top) Scenarios episode map; (Bottom) Event 2 including the narrative scene and a discussion forum activity

posted to the corporate forums,  $F(1, 45) = 7.75, p < .01$ . Neither the main effect of Posting Order nor the interaction between Scenario Type and Posting Order was significant. No significant effects emerged in the ANOVA of the replies per post data ( $p > .05$ ).

Figure 2 shows the content of the first event in the “Working in Teams” scenario. Figure 3 shows a segment of posted notes from the discussion forum activity connected to this event.

We also judged the relevance of notes posted (Table 2), confirming (or not) the informal observation that learners respond to the question provided. We defined relevance as the degree to which the post was “on topic.” Two raters scored each post according to a five-point Likert scale, where we operationally defined each point of the scale (from no relevance through high relevance). The inter-rater reliability was measured using a weighted kappa (0.91). Assessed in this way, the strength of agreement was considered to be “very good.” No significant effects emerged for relevance ( $p$

$> .05$ ) using nonparametric statistics (Kruskal-Wallis); raters judged most posts to be highly relevant.

Moreover, an examination of the percent of team members that participated in the forums indicated that nearly all of the learners ( $> 90\%$ ) posted at least one note in each forum, although the percent of learners who posted more than two notes dropped sharply ( $< 40\%$ ). Reading the forums, there is a sense of responding more to the questions than to each other.

Ultimately, we need to address the question: what makes a conversation deep? Is it the length of notes, their relevance, their quality, or some other factor? A “me too” post (where the learner essentially agrees with another learner) may be relevant but of little use in adding to the conversation. In a live discussion, body cues indicate agreement (e.g., smiles, nods of the head), whereas analogous cues are not easily expressed in a persistent conversation without posting a reply.

Words/Post				Replies/Post			
	First	Last	Totals		First	Last	Totals
<b>Academic</b>	140.9 [122.7] 22	99.1 [63.9] 8	129.8 [110.6] 30	<b>Academic</b>	0.7 [0.9] 22	0.5 [1.1] 8	0.7 [1.0] 30
<b>Corporate</b>	39.2 [21.6] 9	72.4 [37.3] 10	56.7 [34.5] 19	<b>Corporate</b>	0.3 [0.7] 9	0.3 [0.5] 10	0.3 [0.6] 19
<b>Totals</b>	111.4 [113.4] 31	84.3 [51.0] 18	101.4 [95.6] 49	<b>Totals</b>	0.6 [0.9] 31	0.4 [0.8] 18	0.5 [0.8] 49

**Table 1. Means, standard deviations (in square brackets), and number of posts for Words/Post and Replies/Post**

Relevance/Post			
	First	Last	Totals
<b>Academic</b>	4.4 [0.8]	4.5 [1.4]	4.4 [1.0]
<b>Corporate</b>	4.8 [0.4]	4.8 [0.4]	4.8 [0.4]
<b>Totals</b>	4.5 [0.7]	4.7 [1.0]	4.6 [0.8]

**Table 2. Means and standard deviations for Relevance/Post**

**Scene 1. A new start**

**It is Monday afternoon and the Core class is in the School of Education auditorium for a lecture. They have recently completed their first project on procedure learning and have had a few days to recover. Now, Professor Hill is introducing project 2. Ellen sits in the center section, toward the front, and takes notes as Professor Hill talks about the objectives of the project.**


**Professor Hill:** (*looking around the room at the students and clicking to the next slide of her PowerPoint presentation*) Okay, so, to wrap up, these are the goals for the second project. Now, on to your team assignments (*She clicks to the next slide of the PowerPoint. The class sits up and takes notice, people start whispering animatedly.*) These are the team assignments for project two. Take note of who is on your team and you'll have a chance to get together in a couple of minutes. First, though, I'd like to reiterate the importance of team process to the success of project two.

(*Ellen and others in the class sigh and slump back in their seats.*)

**Ellen:** (*thinking*) Team process, here we go again.

**Professor Hill:** (*calmly, making eye contact with the students*): The content of this course is about the principles of instructional design. However, as we talked about at the beginning of the semester, learning how to successfully work in teams is also a major part of this course. This is because you can expect team projects to be commonplace in many workplaces you will encounter in the field of design.

**Ellen:** (*drawing in her notebook*)



**Professor Hill:** So, again a part of your final grade for project two will be on team process. You'll be working with new team members this time, and we hope that you can apply some of the lessons learned on project one about process skills to project two.

**Ellen:** (*thinking to herself*) Yeah, like that's fair. I'm on fellowship and have to maintain a 3.75. Why should my grade depend on two other people with *no work ethic*?

**Figure 2. Episode 1, Event 1: “Working in Teams” scenario**

### 2.3 Continuing the tale

As learners follow the narrative over a sequence of time-revealed episodes, they vicariously experience the successes and failures of the scenario's characters. Each encountered context is familiar to learners because the scenario reflects authentic learner experiences. For example, the “Working in Teams” scenario was written for graduate students who completed a team assignment similar to the one in the story. Many of these students experienced the same challenges encountered by the scenario's characters, including unrealistic expectations of co-workers, cross-cultural misunderstandings, team member underperformance leading to a disproportionate share of the work being performed by others, and unwillingness to confront inappropriate team behavior while simultaneously developing an increased resentment toward one or more members of the team. Interestingly, as learners observe characters solve problems, or not, the learners begin to develop their own strategies as they participate in the scenario's collaborative activities.

In the most successful scenario experiences, the story, over the scenario's instructional span, becomes a backdrop for another narrative – the learner's actual life. The conversation among learners shifts focus from the vicarious to the real.

We can gain a sense of this transformation as we follow the postings of one university learner in “A Community Response to Hate.” Our learner, “Mara,” responded to the first probe concerning free speech vs. hate speech: “My gut instinct is that the person had a legal right to distribute the leaflet, but doing so was clearly not a very moral act. The content of the leaflet is offensive to me, but I get worried about mandating what people can and can't say... I have many questions... How can one start a dialogue with people who believe this sort of thing without it turning into a fistfight? I have to admit that right now my instinct is to avoid confrontation and 'mind my own business'... but I'm hoping to develop some more proactive strategies by participating in this Scenario.” The initial activities ask learners to reflect on how the

<b>Review the resources on Collaborative Learning and Design Teams. What is your reaction to Ellen's view of teamwork? Are there other factors, besides her GPA, that may be important for her to consider?</b>	
<b>Author:</b>	Joan
<b>Subject:</b>	<b>Something else for Ellen to consider</b>
<b>Post:</b>	<p>Working with a team successfully is an important skill to have because it is something that we all will encounter later in life when we get jobs. If teamwork was optional, and Ellen was able to do all projects individually, she may graduate with the 3.75 GPA she wanted, but this does not mean she would excel in the workplace. Being "smart" and getting good grades are not the only things employers look for, and in fact, are many times lower on the list than people skills and team working skills. She needs to worry a little bit less about the moment (getting a high GPA while in school) and focus more on how this will affect her the rest of her working life.</p> <p>Even if she got hired based on her good grades, she would probably have to work with people much different than her and have learned in school to work through these situations will greatly benefit her in the long run. If she has the attitude that the only way that she will get anywhere in life is to work individually or work with people with the same work ethic as she, she will not get very far, because this is not reality. There are always going to be people we are not too excited to work with for whatever reason, and the only way to truly excel is to make the best of any situation, good or bad. If she can only work well by herself or with a "good" team, she has not achieved true success. She will have to realize that team projects have a purpose and are there to help us later in life. They are not some torture activity that professors make us do just because. Only then will she truly succeed.</p>
<b>Author:</b>	Mitchell
<b>Subject:</b>	<b>Re: Something else for Ellen to consider</b>
<b>Post:</b>	<p>Kudos Joan, I concur. Employers now days look for so much more. In Ellen's profile, she appears to be very well rounded. She participated in so many things. Or is that just resume building? Ha, ha. Anyway, I think the next episodes will show who Ellen really is and her attitude with working on group projects. Definitely, her grades are important. Probably more of a factor than any other person in the group. But she still has to have a positive attitude more than not.</p>
<b>Author:</b>	Pete
<b>Subject:</b>	<b>Re: Something else for Ellen to consider</b>
<b>Post:</b>	<p>I totally agree that developing group/people/social skills is a vital skill to post-graduate school success.</p> <p>However, I wonder: do Core teams accurately reflect teams in the working world? Don't team members in the working world often have pre-assigned titles and roles? And don't most real world teams have project managers?</p>

**Figure 3. A segment of posted notes from the discussion forum**

scenario's characters behave. Learners are not required to reveal much about themselves, their attitudes, or how they might behave in similar circumstances. As the story unfolds and the learners become familiar with one another, the questions become more personal and demanding. In a scene where Rose is addressing her sewing circle, trying to raise money for the newly formed coalition against hate, she feels frustrated by the intransigence of her "friends." Learners are asked to explain with whom in this scene they most relate. Mara wrote, "I relate to Annalese. I am never the 'early adopter' of a new strategy - unfortunately. I would like to be more of a

leader in this type of action - but I generally wait and reflect before jumping in."

In a probe to all learners from the facilitator, the facilitator wrote, "Rose is thinking seriously about quitting the sewing circle. Is Rose being oversensitive?" Another learner responded, "Hmm... I would say she's over-sensitive here. Not only is she unwilling to accept her friends' hesitancy to act..., but she also misses an opportunity to continue challenging them to speak up. Her method is to shame them into contributing, hardly an appropriate way to treat friends." But Mara replied, "I wonder if others in the sewing circle are also Jewish. If not, Rose may feel

somewhat abandoned by her 'friends' who refuse to stick up for in what has been, in essence, an attack on HER. In that case I wouldn't blame her for quitting. Sometimes you have to 'put your money where your mouth is.'"

The activities in the last episode encourage the learner to translate thinking into action. As the story develops we learn that despite community efforts, a white supremacist, one year to the day after first sparking controversy, went on a shooting spree killing two people, injuring others, and finally committing suicide. An activity probe asked, "What did you learn about yourself and others from this experience? Did you develop a strategy to deal with bigotry in the future? Did you learn something that enabled you to grow?" Mara responded, "I've learned that it is easy for me to be complacent while living as a racial majority member in Indiana... Now that all Americans are more aware of what hate can do (post 9/11) it has come to the forefront of my mind. I know I need a better strategy than to get emotionally distressed, but I haven't yet figured out what that should be." Yet another learner appeared to get closer to behavioral change: "Actually, I am not an activist. When I read in the newspaper about some social problem, I usually ignore it. After joining the forum, I learned responsibility... Everybody in the community has a responsibility to address hate crimes. We are not observers... And in the future, I will participate in social action and make people understand that our society's problems do not belong to other people. They belong to us even if they do not appear so immediately."

### 2.3 Design Challenges

While many learners compose thoughtful responses to the questions and probes, learners sometimes write their notes as if they are answering a short essay question rather than participating in an ongoing conversation. Few learners post more than once or twice per forum, engaging in a "move forward" (to the next event and activity) versus a "go deep" (engage others in a conversation) writing pattern.

This move forward versus go deep tension can be explained, in part, by the structure of the learning tool. Well-written narratives are engaging; the learner is motivated to move forward to discover what happens next in the story. As learners encounter a new event that includes a discussion forum activity, they may see their task as one of completion rather than one of engaged discussion. Red flags on the episode map signal learners that other team members have posted notes to previous forums, but this may not sufficiently draw learners into deep dialogue. Once the next

episode is opened (typically one week after the previous episode opened), there is a greater motivation to move forward than to review conversations from earlier episodes and events.

Another explanation may simply be a question of time. People are busy. In most environments there are many tasks vying for the learner's limited time. While learners may wish to explore a question further, they may not have the time to do so. Or, given limited time, the topic would need to be of personal importance in order for the learner to return to the discussion and participate further. Finally, learners may not pay attention or understand the intent of the directions to engage in discourse: "Join in the conversation."

Delayed participants, those who enter the forum after others have responded, pose an additional challenge in the design of forums. A parallel problem occurs when learners return to an earlier forum and find new postings. Without reading each new note, the learner may nonetheless desire to understand the sense of the conversation. In a face-to-face conversation among several people, if a new person were to enter the room, someone would likely summarize the conversation for this person. It would take a minute or less, and the delayed participant would be ready to engage. How to replicate this feature in a small-scale persistent forum is less than obvious. The delayed participant or returning participant problem is less of an issue in most large-scale forums. In these, many notes are not related to one another so joining or rejoining at any time is less problematic.

### 2.4 Summary

Scenarios discussion forums led to focused, relevant, postings with nearly all team members participating. Design challenges include accommodating delayed or returning participants and the "move forward versus go deep" problem. These issues are not dissimilar to those found by other researchers [3][4][9][13]. However, while Herring [7] described incoherence and drift in large-scale forums, posts in Scenarios were almost universally relevant. The narrative and the prompting question appear to maintain the forum's coherence. The presence of a facilitator surely contributes to coherence as well, establishing a behavioral norm. The design's weakness is that the relevant conversation is "thin." Learners respond to the prompts more so than to each other.

### 3. Redesign

Every design should have a design message, and this one is no exception: promote deep conversation. To accomplish this goal, we decided to add a new element to the forum structure -- the addition of a social proxy -- rather than to make minor adjustments to the current design. The intent of the proxy is to reflect the following insight: *posts responded to by other learners are interesting posts*. This idea follows from one discussed by Barabási [1] about the behavior of networks. In a competitive environment, each node of a network has a certain fitness. The more links to the node, the greater the fitness, and more fit nodes acquire links more quickly than less fit nodes. Seniority, Barabási points out, is no guarantee of success. “Independent of when a node joins the network, a fit node will soon leave behind all nodes with smaller fitness. Google is the best proof of this: A latecomer with great search technology, it acquired links much faster than its competitors, eventually outshining all of them. Beauty over age” (p. 97).

Now substitute “note” for “node,” and the analogy is complete. A reply is a note that links to another note. Your social proxy must change as a function of posting more fit notes. We could refine the function further by claiming that a reply from a person with a greater “fitness” makes your fitness greater than if a less fit person responded to your post, a kind of transitive fitness function.

Why is this a good candidate for a social proxy? It suggests to learners that if they were to write thoughtful, compelling, perhaps controversial notes, more people would respond to them. The more thoughtful notes in the forum, the more substantial the conversation. Of course, it remains to be seen if this works in practice.

Our redesign is shown in Figure 4. The social visualization is represented by a ring and a set of small circles on the perimeter of the ring. Each circle represents a learner on the team. Since teams are relatively small (20 or fewer participants, often 8-12 participants), there is sufficient room on the ring for each participant. You always know your position on the ring by looking for the arrow pointing to you.

In the redesign, a learner’s circle gets bigger if other learners respond to the learner’s post. An example will clarify the procedure. Imagine that Joan posts a note for which there are seven responses. Mitchell’s 2 replies have 0 responses; Pete’s reply has 3 responses; Joan’s reply to Pete has 2 responses; Ralph’s reply to Joan has 1 response; Ya-Fung’s reply has 1 response. We might represent this example in the

following way, where indentation represents a new thread:

```

Joan
  Mitchell
    Pete
      Joan
        Ralph
          Joan
            Ya-Fung
              Mitchell

```

Thus, a ranking of responses would be: Joan – 9 (seven replies to her first post, and two replies to her second post); Pete – 3; Ralph – 1; Ya-Fung – 1; and Mitchell – 0. Their circles would be sized accordingly. Obviously the counting algorithm could be changed to emphasize different values. For example, one could argue that Joan should not get points for responses that she writes to herself. Another way to modify the system is for learners to acquire “increased importance.” For example, in a research setting, if a distinguished scientist cites your work in this person’s paper (other than as a negative example of what to avoid), one could argue that your work is more important than someone else’s paper that did not get cited. In the above example, getting a response from Joan is better than having Mitchell respond to one of your postings.

We imagine that over time, other factors would be introduced to the proxy. For example, responses may be read and rated by learners. Thus, it would be possible to increase the score for important notes that require no response other than peer acknowledgment. Obviously, the more judgments required, the more training required to use the system and therefore the more complex the system. We, therefore, tend to favor an automatic system, but the value of including judgments of one form or another is worth exploration.

#### 3.1 Erickson’s six claims

To design our social proxy, we were inspired by Erickson’s six claims [5]:

(1) *Everyone sees the same thing*. While customization is reasonable for many applications, it is not for social visualization. The visualization’s power comes from knowing that everyone sees the same thing; behaviors portrayed by the visualization are not hidden. The social proxy will make all features transparent to all learners.

(2) *Portray actions, not interpretation*. Users are better than machines at making interpretations of social visualizations. Let the users interpret the data. The proxy’s visualization will allow the learner to interpret

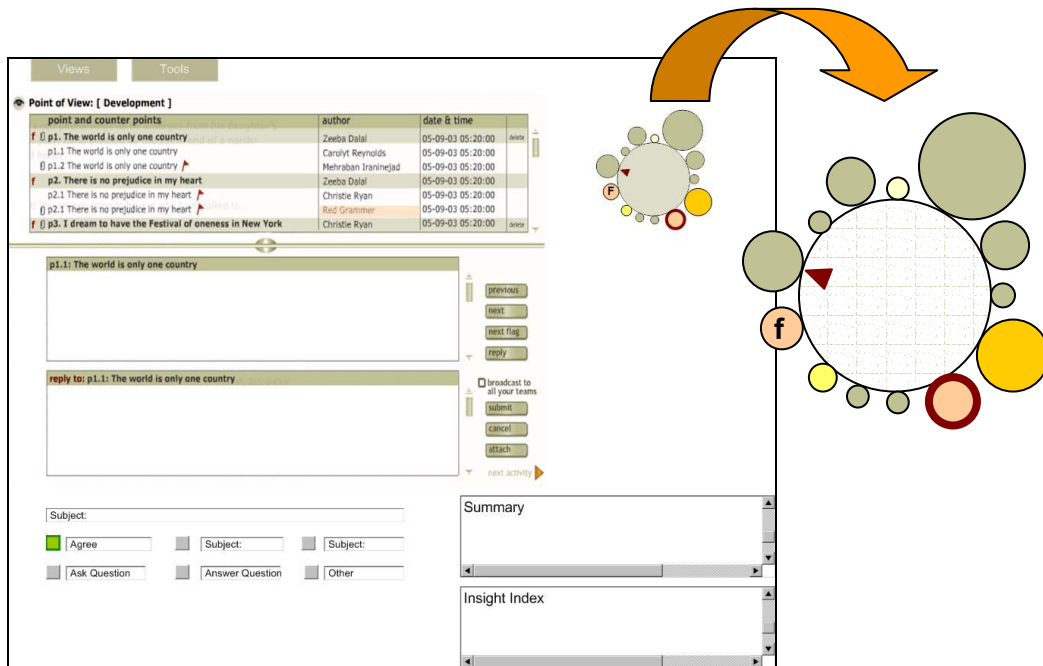


Figure 4. Redesign of the discussion forum in Scenarios showing the social proxy

the behavior of all learners on the team; this should gauge the learner's work in relation to others.

(3) *Social visualizations should allow deception.* If users want to trick the system, allow them to do so. The social proxy will best reflect, from one perspective, "deeper" or multi-layered conversations. However, learners will be able to manipulate the system even though the additional output of the system, the notes themselves, will reveal their game.

(4) *Support micro/macro readings.* Small data patterns ultimately form large data patterns. Each forum will have its own social proxy. Although not described in this design, it would be possible to imagine a meta-proxy across all forums within a scenario, providing a global view of the most in-depth and multi-layered conversation hotspots.

(5) *Ambiguity is useful: suggest rather than inform.* Incomplete and distorted patterns are inevitable. Nevertheless, users accustom themselves to the ambiguity. The social proxy is not a perfect reflection of deeper conversation. However, the views provided will create user insight; learners will make appropriate adjustments.

(6) *Use a third-person point of view.* Users learn to interpret social visualizations by observing their own behavior reflected in the visualization. The proxy will have a direct correspondence to learner behavior.

Individual changes will be reflected immediately in the visualization.

Of course, there are possible disadvantages to the system: (1) the social proxy will exclude "quiet" learners from the reward system; the fewer notes you post, the less likely one of your notes will receive a response; (2) "flame" posts could be inappropriately rewarded by multiple replies; (3) the social proxy might discourage someone from reading posts from a small circle learner, and possibly missing a very good post; (4) not all insightful posts require a response; and (5) the social proxy implies one conversation rather than ongoing multiple conversations.

### 3.2 Other features

Other features could be included in the overall redesign. The delayed participant problem or the issue of the revisiting learner is addressed with a human-human solution. One participant in each forum is selected by the facilitator to be the summarizer of the forum. It is that person's responsibility to post a summary in the summary box located below the social proxy. As the conversation changes, that person edits the summary. As insights are discovered, the facilitator

or the summarizer posts the insight into the insight index, located below the summary box. Thus, a delayed participant or a revisiting learner has an efficient way to “come up to speed” on the forum. Other, more automatic/intelligent solutions may be applied to solve the summary and insight generator task.

Further investigation may be sought through the social proxy. When one clicks on any person’s circle, their notes are highlighted in the notes index section. As any note is read, the note author’s ball is highlighted as well as all users who responded to the note (their balls are highlighted as well).

#### 4. Conclusion

While the above analysis and redesign is focused on small-scale forums and Scenarios in particular, we feel that this paper potentially provides strategies that may be used in the design of persistent conversation tools more generally. We introduced a new kind of social visualization tool that reflects the fitness of a note and consequently the power of the author. The goal is to create conversations that improve the learning of their participants. We believe that for e-learning settings focused on tacit learning, a scenarios-based strategy coupled with newly designed discussion forums and visual tool sets will lead to deeper and more insightful learners. In an environment that rewards speed, flash, and sound bites, these tools counter an uphill battle.

#### 5. Acknowledgments

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